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Guide to statistics in European Commission development cooperation

2023 edition

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Guide to statistics in European Commission development cooperation

2023 edition

Manuscript completed in October 2023.

This document should not be considered as representative of the European Commission's official position.

Luxembourg: Publications Office of the European Union, 2023

EN PDF ISBN 978-92-68-07816-7 ISSN 2315-0815 doi: 10.2785/830784 KS-GQ-23-013-EN-N

Foreword

Reliable and relevant official statistics are essential for all aspects of public discourse. They constitute a fundamental tool for policy makers to measure progress towards development goals and provide information about the effectiveness of policies and programmes.

This Guide provides extensive information on statistics in development cooperation, presenting key international initiatives supporting partner countries in building sustainable statistical systems that produce high-quality official statistics. It provides information on how to identify and develop actions in support of essential statistics and how to use data and indicators to define and follow-up cooperation programmes.

It also includes various significant developments, including the sustainable development goals (SDGs) and the SDG indicators framework, the UN World Data Forum and other related initiatives. The implementation of development programmes aimed at achieving the SDGs has further raised the demand for high-quality statistics in this area.

The EU is the biggest provider of development assistance in the world. In the area of statistics, the European Commission, together with the EU Member States, is highly involved in the field of international statistical cooperation, with Eurostat — the Statistical Office of the EU — at the forefront of developing methodology and instruments for harmonised and reliable statistics. This publication is intended to support EU Delegations around the world, as well as various EU/EC services, and more generally, those involved in implementation of statistical cooperation programmes.

The Covid-19 pandemic has underscored the importance of reliable and timely official statistics to measure rapidly evolving phenomena and monitor the dynamic situations. Capacity development and technical assistance have been vital to help the National Statistical Systems to cope with the demands on statistics.

For a non-statistician, the Guide explains how national statistical systems are organised and how they function, the central role of national statistical offices, as well as core international quality frameworks and principles for official statistics. Overall, the Guide has been designed as a dynamic, interactive tool providing technical references and guidance on statistics, through hundreds of active hyperlinks for further information.

This updated version of the Guide is the sixth consecutive edition. Over the past decade, the Guide has undergone several revisions, the most recent one being done in 2021, when the whole publication was updated except for the volume on economic statistics. Therefore, in the 2023 edition, special emphasis has been made to update the economic chapters in view of the recent statistical developments. Overall, the first three sections explain how statistics contribute to the development process. Furthermore, Chapter B.5 introduces crucial international statistical classifications as a new addition. The remaining sections feature thematic chapters addressing statistics that can be used to support European Commission policy objectives in specific sectors.

I trust that you will find this revised edition of the Guide to be a valuable resource. As always, Eurostat welcomes any feedback and ideas on how to further develop and enhance this publication.

Mariana Kotzeva

Director-General, Eurostat

Abstract

The "Guide to statistics in European Commission development cooperation" gives practical and detailed answers to the following questions: the role of statistics in the development process, the identification and development of actions to support statistics and the use of statistical indicators to define and follow-up cooperation programmes, including sector policies.

Chief editor
Mariana Kotzeva

Editors:
Unit B3 - Enlargement, neighbourhood and development cooperation

Production: Artemis Information Management in Consortium with Quantos S.A. –Statistics & Information Systems.

For more information/contact details
Eurostat Bâtiment Joseph Bech
5, rue Alphonse Weicker
2721 Luxembourg LUXEMBOURG
Internet: https://ec.europa.eu/eurostat/
E-mail: estat-statistical-cooperation@ec.europa.eu

Acknowledgements

Eurostat is grateful to those who provided their contributions towards the compilation of this Guide.

Unit B3 would like to thank all the contributors to this Guide, especially Eurostat Units B1, C1, C4, D1, E2, G3, G5, G6 for their support. Special thanks go to unit B4 for their guidance and useful suggestions.

Eurostat editorial work has been done by Francisco de Miguel, Otilia Trandafir and Ellen Cathrine Kiøsterud from Unit B3, "Enlargement, neighbourhood and development cooperation", with Avis Beneš as Head of Unit.

The production and the compilation of the Guide have also been made possible by our colleagues from Artemis Information Management in consortium with Quantos s.a.: Photis Stavropoulos- the main coordinator; Neil Dourmashkin, Vanda Guereirro, Amerigo Liotti, Romesh Paul and Bernd Struck (in alphabetical order) who substantially revised Chapters F.17 – F.21. The layout of the Guide was prepared by Manos Symeonakis and Spyros Polikandriotis.

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Guide to statistics in European Commission development cooperation

INTRODUCTION: THE GUIDE TO THE GUIDE

Part A. Introduction: the guide to the Guide

A.0.1. Why a Guide to statistics in European Commission development cooperation and who should read it?

'I have no data yet. It is a capital mistake to theorise before one has data. Insensibly one begins to twist facts to suit theories, instead of theories to suit facts...'

Sherlock Holmes in 'A Scandal in Bohemia' by Sir Arthur Conan Doyle, 1891

The purpose of the Guide to statistics in European Commission development cooperation is to explain why statistics are important for development cooperation, how to use them and what needs to be done to make them available. It is not intended to be a course in statistics and statistical methods. Alternative and additional reading is shown in the 'To find out more' box at the end of each section.

The Guide is the fruit of a close cooperation amongst Commission services and international stakeholders in statistical cooperation for development. It is principally aimed at supporting EU staff working in development cooperation, especially in EU delegations. However, it is also relevant to other actors in statistical development programmes. In particular, it aims to aid practitioners who need to know more about statistics in development cooperation context. The Guide explains why and how statistics are relevant to their work and what they need to do in various situations. It provides the information required for Commission staff to undertake the following tasks:

- Use statistical indicators to design and monitor development programmes;
- Identify and develop statistics support actions;
- Promote the use of statistics at each stage of the aid cycle;
- Advocate for early consideration of which statistics and indicators will be needed for implementation, evaluation and impact assessment (and what is required to obtain these).

The Guide aims to answer a number of basic questions about development statistics:

- Part A, this Introduction, is a guide to when and how to consult the Guide.
- Part B: Statistics in Development, looks at why and how statistics enter the development process and how to understand and check data.
- Part C: Support for Statistics, considers when and how the European Commission needs to act to make sure that good quality statistics are available to support its development goals.
- Parts A-C are complemented by four thematic parts dealing with the use of statistics for policy issues. Chapters in these parts look at how statistics can be used and supported to achieve European Commission policy aims in specific sectors.

When arguing that statistics are important but bread is more urgent, one should ask oneself on what information the answers to the following questions are based: 'How much bread?' and 'Where is it needed?' Development fundamentally is about people and about eliminating poverty. In order to manage the process, it is essential to measure it. While statistics may not directly reduce poverty or hunger, they are an essential component of a complex process. Without adequate statistical data it is by no means certain that actions to reduce poverty will be directed at the right problem, that they will be effective or that they will result in sustained improvements.

It is obvious that good and reliable statistics are necessary to donors, in order to assess where aid is most needed, to use resources efficiently, to measure progress and to evaluate results. There is broad consensus that the Sustainable Development Goals (SDGs) identify the desired outcomes as well as the means for measuring progress. Thus, statistics are vital to 'Managing for Development Results' with shared accountability and focus on results.

A key issue is the need for good country-specific and country-owned policies and institutions. Better statistical data and improved analysis can create a political will for change. Without good statistics, governments cannot deliver efficient administration, good management, and evidence-based policymaking. An effective and efficient national statistical system, providing regular and reliable data on the economy and the well-being of the population, is an important indicator of good policies and a crucial component of good governance.

Statistics also provide a means for the media, non-governmental organisations and any citizen to monitor the activities of government. The ability to provide regular and reliable data on the economy and the well-being of the population is an important indicator of good policies and institutions. When the statistical system produces quality data which are trusted by the public, transparency increases and accountability is promoted. The quality and availability of data depend on the capacity of the institutions involved in the national statistical system, which are often undervalued and underfunded.

Now read on, this Guide will help you find what you want to know.

A.0.2. What is in the Guide

A.0.2.1. STATISTICS IN DEVELOPMENT

Part B, Statistics in Development looks at why and how statistics enter the development process and how to read and check data.

Chapter B.1, Statistics for development cooperation, explains the increased demand for development statistics from a global policy perspective by examining the international initiatives that focus on performance measurement and results-based policymaking. The initiatives covered are:

- Sustainable Development Goals;
- National Development Strategies and the need for statistics;
- Global Partnership for Effective Development Co-operation;
- Cape Town Global Action Plan for Sustainable Development Data;

The discussion of the European Consensus on Development and budget support places the global initiatives in a European context.

The outcome of these policy initiatives is increased demand for:

- indicators to measure progress toward policy goals,
- indicators to inform the preparation, monitoring and evaluation of individual policies and instruments,
- indicators to prepare, monitor and evaluate development actions.

Many, probably the majority, of these indicators are based on statistics.

Chapter B.2, How statistics are made, gives a minimally technical introduction to the production of statistics. Official statistics are a public good, consisting of data published by government agencies or by regional and international organisations such as the UN, together with explanations of how the data were compiled (metadata). The chapter looks at:

- the fundamental principles of statistics: what makes for useful data and legal framework for statistics;
- the process of statistics operations from analysis and design to dissemination of results;
- the institutional framework: the national statistical system and how it relates to users of statistics;
- the role of regional and international organisations in producing statistics and in standardising concepts and methods;
- new sources of data, including Big Data and Open Data;
- communication and visibility of official statistics.

Chapter B.3, Statistics and indicators in the European Commission development aid process, examines the indicators used to inform policies. It places the various types of indicators used by the European Commission in the context of their use at each stage in the programming cycle and in reporting to provide visibility and accountability.

Chapter B.4, Statistics across policy sectors focuses on international policy-related indicators:

- Sustainable Development Goals (SDG) indicators;
- Indicators commonly used by IMF and the World Bank Group in cooperation with partner countries.

The chapter also provides a cross-reference between the European Commission's policy sector definitions and statistical activities, linking to the sector statistics chapters contained in the four thematic parts of the Guide (volumes 1 – 4 in the 2021 edition of the Guide).

Chapter B.5, International statistical classifications, provides a brief introduction to the importance and utility of international statistical classifications and continues with the presentation of a small number of important such classifications.

A.0.2.2. SUPPORT FOR STATISTICS

Part C, Support for Statistics considers when and how the European Commission needs to act to ensure that statistics are available to support its development goals. Part C is more applied and 'hands on' than Part B.

Chapter C.6, How to decide on a statistical action, considers support actions for statistical capacity building and/or strengthening the demand for statistics. The chapter starts with a presentation of 'quality' in statistics: what should a partner country's statistical system be able to provide for its users? It then considers how to evaluate a country's statistics and the system that produces them. In passing, it explains how to construct the Commission's standard data tables.

The chapter presents key developments in the organisation of statistical operations and processes over recent years, including the Generic Statistical Business Process Model (GSBPM), the Generic Activity Model for Statistical Organisations (GAMSO), the Generic Statistical Information Model (GSIM), the Common Statistical Production Architecture (CSPA) and the Common Statistical Data Architecture (CSDA).

Chapter C.7, How to bring assistance to statistics, provides guidance on whether and how to give support to statistics. It discusses the relationship of statistics strategy with national development and poverty reduction strategies and analyses the development and implementation of statistics strategies. The chapter also discusses capacity development (CD) in statistics, covering the link to statistical strategy documents and practical considerations, and linking to the Capacity Development 4.0 approach of PARIS21. Having looked at what is to be done, the chapter moves on to examine how statistics actions in general should be set up. Coordination at various levels is addressed: who can do what and what needs to be done to ensure coherence and eliminate duplication?

Chapter C.8, The European Commission's support to statistics, starts at the point when the development partners accept that there is a need for external support to statistics. The chapter aims to inform the decision about whether and how the European Commission should be involved. It first considers the Commission's development statistics activities in the context of country / regional strategies and

programmes, including any statistics strategy. It continues by looking at the purpose of statistics actions and how they are linked to the development objectives using the logical framework. The chapter finishes with a practical look at the various types of European Commission statistics interventions, showing links with policies, identifying areas of cooperation, listing examples and providing action points.

Chapter C.9, How to manage statistics actions, starts at the decision that a European Commission statistics intervention is justified to achieve the goals agreed with its development partners. This chapter presents guidance on how to prepare actions to support statistics capacity building and major statistical projects. It provides practical advice for preparing and evaluating terms of reference at each stage of the programme cycle.

A.0.2.3. STATISTICS FOR DEVELOPMENT POLICIES

The rest of the Guide has been separated into four thematic parts, generally following the main structure of the Agenda 2030 and the SDGs, as well as the updated European Consensus on Development:

- Part D: Sustainable development goals and indicators
- Part E: Population and social statistics
- Part F: Economic statistics
- Part G: Environment and climate change

Each of these parts constituted a separate volume (volumes 1 – 4) in the 2021 edition of the Guide.

These thematic parts contain sector chapters covering the following statistical domains:

Part D: Sustainable development goals and indicators

- SDG and sustainable development indicators

Part E: Social statistics

- Justice and crime statistics
- Living conditions, poverty statistics
- Population and migration statistics
- Education statistics
- Health statistics
- Labour market statistics

Part F: Economic statistics

- National Accounts
- Government finance and public sector statistics
- Price statistics
- International trade statistics
- Business statistics
- Transport statistics
- Income and consumption statistics

Part G: Environment and climate change

- Environment statistics
- Energy statistics
- Agriculture, forestry and fishing statistics

The individual sector statistics chapters look at how statistics can be used and supported for decision-making and monitoring achievements in the context of the European Commission's development policy priority areas. Each chapter follows a more or less standard structure, presenting statistics in the context of sector policies, followed by information on their use, quality analysis and any support required. The chapter structure is as follows:

1. Policy applications and the statistics to inform them;
2. Concepts and definitions;
3. Sources of data and metadata;
4. Analysing data quality and identifying problems;
5. Key issues for building or improving a statistical system in the sector.

A.0.3. How to read the Guide

The aims of this Guide to statistics in European Commission development cooperation are:

- To present the material in a logical order, so that it can be read like a manual;
- To keep the technical language and specialised statistical vocabulary to a minimum;
- To provide current references to further technical information, best practices and examples. These references are generally provided as active hyperlinks in the 'To find out more' boxes;
- To help users with specific questions to easily find the information required.

In order to make the user's task easier, there are text boxes at the start and end of each chapter. The 'chapter in brief' box starts each chapter and provides a summary of one to two paragraphs. Most sections and each sector chapter end with a 'To find out more' box, which provides references, hyperlinks and supporting information for further research.

The table of contents is provided in detail so that most key issues can be found easily. Hyperlinks are also provided to Eurostat's Concepts and Definitions Database (CODED) and the OECD's Glossary of Statistical Terms.

The Guide is prepared primarily to be used as an electronic document to be disseminated in PDF format. To navigate through the text and find related information, the user can simply click on the interactive links from the Table of Contents. To consult external references over the Internet, the user just has to click on the hyperlinks in the 'To find out more' boxes. The user may also use the normal 'search' facility for PDF documents to find the information of interest, searching on specific keywords or key terms.

To find out more…

These boxes, provided at the end of most sections, summarise reference documents and in most cases give hyperlinks to them, e.g.

- Eurostat: Concepts and Definitions Database (CODED)
- Organization for Economic Co-operation and Development (OECD): Glossary of Statistical Terms
- European Consensus on Development
- Conference of European Statisticians: Classification of Statistical Activities (CSA)

To find out more…

- Please send comments, suggestions or requests for information on the Guide to: estat-statistical-cooperation@ec.europa.eu
- Eurostat's website, section on international cooperation
- Eurostat's 'Statistics Explained' portal, section on statistics about non-EU countries

A.0.4. How the Guide is developed

The Guide is being further developed to support its users in their work. Your views are therefore sought on its future. You are encouraged to provide your comments and suggestions on the Guide by e-mail to Eurostat's Unit 'Enlargement, neighbourhood and development cooperation'.

A major change in the structure of the Guide is that it has been reintegrated into a single volume. The separate volumes of the 2021 edition have become parts in the new edition.

One new chapter has been developed, chapter B.5, "International statistical classifications". It presents the classifications most frequently used in official statistical production.

In addition, the chapters of part F, "Economic statistics", have been revised extensively.

Finally, the hyperlinks to references, further information and other resources have been maintained and updated.

B

Guide to statistics in European Commission development cooperation

STATISTICS IN DEVELOPMENT

B.1 Statistics for development cooperation

B.1. Statistics for development cooperation

The chapter in brief

This chapter explains the increasing need for statistics in partner countries, examining the international initiatives which focus on development efficiency, performance measurement and results-based policy making. The chapter begins with the global approaches, covering the 2030 Agenda and the Sustainable Development Goals. It describes the development of initiatives focusing on aid efficiency and effective development. The discussion of the European Consensus on Development places the global initiatives in a European context. Finally, the chapter also covers the principles and modalities of European Union budget support to partner countries.

B.1.1. The Sustainable Development Goals

The Millennium Declaration was signed in September 2000, committing the 189 signatory nations to work together to achieve eight Millennium Development Goals (MDGs). The MDGs provided the agreed overall aims of development policy, to be reached by 2015. The progress towards these targets was assessed through 21 quantifiable targets with 60 linked statistical indicators, developed by the Inter-Agency Expert Group on MDG indicators (IAEG). These indicators enabled regular monitoring of progress toward the MDG targets at national and global level. The MDG monitoring framework was innovative in that it brought measurement of outcomes and comparison of these across countries into the centre of development policy and practice. Making these measurements and drawing valid comparisons and conclusions are considerable challenges to statistics in partner countries.

The 17 Sustainable Development Goals (SDGs) were adopted at the UN Sustainable Development Summit 25–27 September 2015 in New York, under the title "Transforming our world: the 2030 Agenda for Sustainable Development". The SDGs focus on areas of critical importance for humanity and the planet, summarised in the following main headings:

- **People:** ending poverty and hunger;
- **Planet:** protection of the planet for future generations;
- **Prosperity:** ensuring that all human beings can enjoy a prosperous and fulfilling life in harmony with nature;
- **Peace:** societies free from fear and violence respecting human rights;
- **Partnership:** strengthening the spirit of global solidarity with the participation of all countries, all stakeholders and all people.

To monitor the progress towards the 17 SDGs and their 169 targets, a robust and simple global monitoring framework was needed. The Inter-agency and Expert Group on SDG Indicators (IAEG-SDGs) proposed a global monitoring framework for the SDGs, which was agreed by the UN Statistical Committee in March 2016. The list of SDG indicators is subject to annual refinements and more comprehensive reviews in 2020 and 2025. At the time of writing, there are 231 unique SDG indicators. Eight of these indicators provide information for monitoring of two different SDG targets, while four indicators provide information for three different SDG targets. Thus, the total number of indicators listed in the full global indicator framework is 247.

Each of the indicators are assigned to a custodian agency, in some cases to two or more co-custodians. These custodians are generally UN bodies or, in some cases, other international organisations who are responsible for compiling and verifying data from the reporting countries. In order to assure comparability across countries and regions, the custodian agencies are also responsible for developing standards and monitoring methodologies, and for strengthening national capacities for monitoring and for reporting data. In some cases, the custodian needs to produce estimates, e.g., when data are missing, inconsistent or compiled using a deviating methodology. All data are validated and approved by the countries before being transmitted to the UN Statistics Division and included in the SDG Global Database. SDG Global Database also provides metadata for the different indicators.

Data are produced by national statistical systems, ensuring national ownership. Countries are asked to strengthen collection of baseline data in order to better measure progress for each of the SDGs. A core element of the global indicator framework is the disaggregation of data and the coverage of particular groups of the population, in order to fulfil the main principle of the 2030 Agenda of "leaving no one behind", e.g., by gender, by age group or by rural versus urban population. Thus, statistical capacity building is essential for national statistical systems to meet the demands of the 2030 Agenda.

A key portal for information on the SDG global monitoring framework is the UN Statistical Division's Sustainable Development Goal indicators website: https://unstats.un.org/sdgs. It contains the SDG Global Database, together with the metadata repository for the indicators and the work programme of the IAEG-SDGs. It also provides an overview over relevant events, an E-Handbook on the SDG indicators aimed at national statisticians, as well as information from custodian agencies on their data collection processes and a focal point for each indicator.

For further and more detailed information the SDGs and the indicators to measure progress towards them, please have a look at chapter D.10 of this Guide and the relevant websites of the UN Statistics Commission and UN Statistics Division (see the following 'To find out more' box).

To find out more…

about Sustainable Development Goals and SDG indicators:

- UN Resolution 66/288 (2012), "The future we want"
- UN Resolution 70/1 (2015), "Transforming our world: the 2030 Agenda for Sustainable Development
- The Sustainable Development Goals
- Inter-Agency and Expert Group on Sustainable Development Goal Indicators (IAEG-SDGs)
- Report of the Inter-Agency and Expert Group on Sustainable Development Goal Indicators to the 47th session of the UN Statistical Commission (including list of proposed SDG indicators)
- UN Statistical Division: SDG Indicators website
- SDG Global Database
- SDG Indicators Metadata repository
- E-Handbook on the Sustainable Development Goals Indicators
- European Commission - DG International Partnerships

Box B.1.1: Results chain in results-based management

Impact	The higher-order objective to which a development intervention is intended to contribute;
Outcome	The likely or achieved short-term and medium-term effects of an intervention's outputs;
Output	The products, capital goods and services which result from a development intervention; may also include changes resulting from the intervention which are relevant to the achievement of outcomes;
Activity	Actions taken or work performed through which inputs (such as funds, technical assistance and other types of resources) are mobilized to produce specific outputs;
Inputs	The financial, human and material resources used for the development intervention.

Source: OECD/DAC "Glossary of Key Terms in Evaluation and Results Based Management"

B.1.2 Aid efficiency and effective development

B.1.2.1 MANAGING FOR DEVELOPMENT RESULTS

The Monterrey Conference on Financing for Development (2002) called for "better measuring, monitoring and managing for results". To achieve this, reliable and relevant data are needed. The objectives of the meeting were to ensure that aid would be used as effectively as possible and that aid could be demonstrated to have an impact on policy objectives. The 'Managing for development results' approach was therefore developed as a "a management strategy focused on development performance and on sustainable improvements in country outcomes". It provided a framework for development effectiveness in which performance information is used for improved decision-making.

To better manage their development processes towards desired outcomes, partner countries should adopt results-based approaches to public sector management, building national capacity for results-based monitoring and evaluation (M&E) and strengthening statistical capacity. Effective M&E shows the extent to which specific activities or programs contribute to achieving national outcomes.

In general, **statistical capacity** governs the ability to collect and use statistics to feed into the M&E system. Building public sector capacity to collect and use statistical data empowers countries as they seek to exercise stronger public management leadership.

The "Managing for Development Results" initiative identified the **need for improved statistics and so brought demand for statistics into the mainstream of development planning**. The outcome was the Marrakech Action Plan for Statistics (MAPS), agreed at the Marrakech Roundtable on Managing for Development Results (2004). The conclusions of the Marrakech Roundtable were a key input to the principles on development progress of the Paris Declaration on Aid Effectiveness (2005).

Box B.1.2: The Marrakech Action Plan for Statistics

The Marrakech Action Plan for Statistics (MAPS) defined six key actions to support statistics systems, so that they could provide the data needed. These key actions were:

1. Promote **strategic planning** for developing statistical systems
2. Prepare for the **2010 census round**
3. **Increase investment** in statistical systems
4. Set up an international network to better coordinate **support for household surveys**
5. Make **immediate improvements in key areas**, especially the MDGs
6. **Improve coordination** and accountability of the international statistical system

Several important international initiatives have been rooted in the MAPS action points:

- National strategies for the development of statistics (NSDS) were incorporated into strategic planning processes, with PARIS21 promoting dialogue and advocacy for statistics and coordinating the development and implementation of the NSDS methodology.
- The World Population and Housing Census Programme was set up, providing a knowledge base and resource centre. Censuses are primary data sources for inclusive socioeconomic development and environmental sustainability and for disaggregated data. Censuses are key to measuring progress towards the 2030 Agenda for Sustainable Development, providing data by income, sex, age, race, ethnicity, migratory status, disability, geographic location etc.
- A concerted approach for scaling up statistical capacity building, consisting of a 'sector-wide' approach to statistics combined with pooled donor funding. A set of international financing instruments was established, mainly focused on supporting development and implementation of NSDS and of statistical capacity development.
- The International Household Survey Network (IHSN) was set up to improve the availability, quality and use of survey data in partner countries, providing improved international coordination, harmonised technical and methodological guidelines and best practices for survey implementation. In addition, the Accelerated Data Program (ADP) was created to help countries improving their survey programs and increasing the use and value of survey data, providing technical and financial support to documentation and dissemination, as well as for improving national survey methods.
- A variety of organisations were engaged in training and in monitoring statistical capacity in connection with the MDGs. These activities to build and improve a global monitoring framework for development policies and strengthen statistical capacity were taken further in the SDG monitoring framework. The 'High-Level Group for Partnership, Coordination and Capacity-Building for statistics for the 2030 Agenda for Sustainable Development' (HLG-PCCB) provides strategic leadership for statistical monitoring and reporting in the SDG implementation process. The UN Statistical Commission has also initiated the UN World Data Forum on Sustainable Development Data as a platform for intensifying cooperation between IT specialists, geospatial information managers, data scientists, and users, as well as civil society stakeholders.
- An increased focus on the accountability for the international statistical system, including the transparency and predictability of funding for statistical capacity development on partner countries. The PARIS21 Partner Report on Support to Statistics (PRESS) provides details of donor support to statistics.

The Paris Declaration on Aid Effectiveness (2005) stated five fundamental principles for making aid more effective:

- **Ownership:** Partner countries set their own strategies for poverty reduction, improve their institutions and tackle corruption.
- **Alignment:** Donor countries align behind these objectives and use local systems.
- **Harmonisation:** Donor countries coordinate, simplify procedures and share information to avoid duplication.
- **Results:** Partner countries and donors shift focus to development results and results get measured.
- **Mutual accountability:** Donors and partners are accountable for development results.

The Accra Agenda for Action (AAA) (2008) aimed at accelerating progress towards the objectives laid down in the Paris Declaration. It further strengthened donors' commitment to working through national systems in recipient countries and increasing transparency and predictability, with conditions based on the partner countries' own development. Partner countries committed to strengthen the quality of policy design, implementation and assessment by improving co-ordination and linkage of various sources of information, including national statistical systems, budgeting, planning, monitoring and evaluations of policy performance. In 2011, the Fourth High Level Forum on Aid Effectiveness in Busan, Korea, noted the need for transparent, country-led and country-level results frameworks, based on a manageable number of output and outcome indicators. The Busan HLF endorsed a new action plan for statistics, the 'Busan Action Plan for Statistics' (BAPS), building on the success of the Marrakech Action Plan for Statistics.

The Busan Action Plan for Statistics encouraged a coordinated, system-wide approach to statistical capacity development. The aim was to establish sustainable statistical systems that produce high-quality statistics that could be maintained through national resources (and, where needed, by additional external resources). The Busan Action Plan for Statistics proposed five broad actions to produce sustainable improvements in statistical capacity:

- Strengthen and re-focus national and regional statistical strategies with particular emphasis on improving statistical systems that address country-level development priorities.
- Implement standards for data preservation, documentation, and dissemination that permit broader public access to statistics.
- Develop programs to increase the knowledge and skills needed to use statistics effectively for planning, analysis, monitoring, and evaluation, thus increasing transparency and accountability and improve accessibility of statistics.
- Build and maintain results-monitoring instruments to track outcomes of all global summits and high-level forums. Outcome documents should specifically recognize the need for statistical capacity development, including technical assistance, training, and financial support.
- Ensure financing for statistical information is robust and that funding instruments and approaches reflect the new modalities and actors in development finance.

The Addis Ababa Action Agenda (AAAA) was the outcome of the 2015 Third International Conference on Financing for Development, held in Addis Ababa, Ethiopia. The agreement is a follow-up to the Monterrey Consensus (2002) and the Doha Declaration on Financing for Development (2008). It provides concrete measures to finance sustainable development and a global framework to align financing flows and policies with economic, social, and environmental priorities. The AAAA is closely aligned with and complimentary to the 2030 Agenda for Sustainable Development, outlining ways for raising the financial resources required to achieve the Sustainable Development Goals. The AAAA is described in more detail in section B.1.2.3.

B.1.2.2 GLOBAL PARTNERSHIP FOR EFFECTIVE DEVELOPMENT COOPERATION

The Busan HLF also set out a new framework for increasing the quality of aid, the Global Partnership for Effective Development Co-operation (GPEDC). Although the core function of the Global Partnership is to ensure political level accountability, there is a strong focus on results, on sustainable development, and on enhancing partner countries' capacities, aligned with the priorities and policies set out by partner countries themselves.

The final meeting of the Working Party on Aid Effectiveness in 2012 endorsed the mandate and governance of the Global Partnership and the global monitoring framework. The meeting also endorsed a common open standard for publication of information on development cooperation resources, bringing together the existing standards of the International Aid Transparency Initiative (IATI) and the standards of the OECD Development Assistance Committee (DAC).

The main aim of the Global Partnership is to "maximise the effectiveness of all forms of co-operation for development for the shared benefits of people, planet, prosperity and peace." It brings together governments, bilateral and multilateral organizations, civil society, the private sector and representatives from parliaments and trade unions among others, who are committed to strengthening the effectiveness of their partnerships for development and the 2030 Agenda.

The OECD Secretariat and the UNDP provide a joint support team to the Global Partnership both at the global and country levels. The key activities are related to monitoring and analysis of evidence as well as to supporting country level accountability frameworks, the latter particularly through UNDP country offices.

The global monitoring framework is comprised of ten indicators. Five are measured using information collected from individual partner countries and aggregated to offer a global overview of progress, while the remaining five indicators rely on other existing global processes or desk reviews. The approach relies on information collected through country level accountability frameworks and existing global datasets. Participation in the global monitoring is voluntary; however, all development stakeholders are encouraged to participate in it.

The global monitoring framework indicators focus on some key commitments: country results frameworks, enabling environment for civil society, engagement of private sector, transparency, predictability, aid as part of national budgets approved by parliaments, mutual accountability frameworks, gender equality, effective institutions (including quality and use of country systems) and untied aid. The Global Partnership's monitoring framework provides evidence to SDG follow-up of SDG Targets 17.15, 'Respect each country's policy space and leadership to establish and implement policies for poverty eradication and sustainable development', 17.16, 'Enhance the Global Partnership for Sustainable Development, complemented by multi-stakeholder partnerships that mobilize and share knowledge, expertise, technology and financial resources, to support the achievement of the Sustainable Development Goals in all countries, in particular developing countries', and 5c, 'Adopt and strengthen sound policies and enforceable legislation for the promotion of gender equality and the empowerment of all women and girls at all levels'.

B.1.2.3 FINANCING FOR DEVELOPMENT

The financing needed to achieve the 2030 Agenda for Sustainable Development are very large, but it is not impossible to raise the necessary funding through global public and private investment. However, this presupposes that these financial resources are invested in and aligned with sustainable development. This requires a comprehensive approach, which mobilises public finance and sets appropriate public policies and regulatory frameworks.

The Addis Ababa Action Agenda (AAAA) provides:

- A comprehensive set of policy actions by Member States, with a package of over 100 concrete measures to finance sustainable development, transform the global economy and achieve the Sustainable Development Goals.
- A new global framework for financing sustainable development that aligns all financing flows and policies

with economic, social and environmental priorities and ensures that financing is stable and sustainable.

The AAAA draws upon all sources of finance, technology and innovation, promotes trade and debt sustainability, harnesses data and addresses systemic issues. It sets out a global framework that seeks to align financing flows and policies with economic, social, and environmental priorities.

The AAAA defines seven Action Areas:

- Domestic public resources
- Domestic and international private business and finance
- International development cooperation
- International trade as an engine for development
- Debt and debt sustainability
- Addressing systemic issues
- Science, technology, innovation, and capacity building

It also contains a section on data, monitoring and follow-up.

The AAAA policy framework realigns financial flows with public goals. Official development assistance (ODA) remains crucial, particularly for countries most in need.

However, public aid will not be sufficient to reach the SDGs. The AAAA addresses all sources of finance: public and private, domestic and international. It acknowledges that finance is not limited to financing flows, but also depends on public policies that strengthen the national and international investment environments. The AAAA underlines that countries themselves have the primary responsibility for their economic and social development, while committing the international community to create an enabling environment for their development.

The AAAA was adopted shortly before the 2030 Agenda for Sustainable Development. It specifically states that one of the tasks of the Addis Ababa conference was "to further strengthen the framework to finance sustainable development and the means of implementation for the universal post-2015 development agenda". The 2030 Agenda states "The Addis Ababa Action Agenda supports, complements, and helps contextualize the 2030 Agenda's means of implementation targets.

The AAAA outlines public policies and regulatory frameworks to encourage private investments that support the SDGs. It highlights the importance of long-term investment and of all financing to be aligned with sustainable development. It discusses how public finance can contribute and highlights the role of national and international development banks.

Box B.1.3: Action initiatives of the Addis Ababa Action Agenda

The Addis Ababa Action Agenda includes several new commitments by Governments. These include:

A new social compact to provide social protection and essential public services for all

Over 2.4 billion people still lack access to clean water and sanitation, 57 million of the world's children are not enrolled in school, and more than half the world's population lacks any social security coverage. As part of a new social compact, Governments commit to provide fiscally sustainable and nationally appropriate social protection systems, including social protection floors. Governments are also encouraged to set nationally appropriate spending targets for quality investments in essential public services for all, including health, education, energy, water and sanitation. To this end, Governments agree to mobilize additional domestic public resources. At the same time, the international community commits to strong international support for these efforts.

A global infrastructure forum to bridge the infrastructure gap

Financing needed for basic infrastructure investment in partner countries is estimated to be between $1 trillion and $1.5 trillion annually. To address this financing gap, Member States agree to launch a global infrastructure forum, building on and better coordinating existing infrastructure initiatives. The forum will encourage a wider range of voices to be heard, particularly from partner countries. It will identify and address infrastructure and capacity gaps, with the aim to ensure that no country or sector is left behind, and that the commitment to the social and environmental dimensions of sustainable development is respected.

An 'LDC package' to support the poorest countries

While official development assistance (ODA) has risen, the share allocated to least developed countries (LDCs) has fallen by 16 per cent last year. As part of the Action Agenda, developed countries commit to reverse this trend. The Action Agenda further encourages them to increase the target for ODA to the world's poorest nations to 0.2 per cent of national income, with the European Union promising to do so by 2030. Countries also agree to adopt or strengthen LDC investment promotion regimes, including with financial and technical support. In addition, Governments aim to operationalize the technology bank for the LDCs by 2017.

A Technology Facilitation Mechanism to advance to the SDGs

The Action Agenda recognizes the technology divide across a wide range of economic sectors which makes it difficult for partner countries to achieve sustainable development. To help facilitate development, transfer and dissemination of technologies relevant for achieving the SDGs, Member States agree to establish a Technology Facilitation Mechanism, consisting of a United Nations Interagency Task Team, an annual collaborative Multi-stakeholder Forum on Science, Technology and Innovation for the SDGs, and an on-line platform.

Enhanced international tax cooperation to assist in raising resources domestically

Additional tax revenues are required to deliver the new social compact and finance sustainable development. Both improved domestic tax administration and strengthened international tax cooperation are essential to ensure that adequate finance is available. To aid in these efforts, countries agree to strengthen capacity building, including through ODA. They also agree to support existing international initiatives for tax cooperation, with a focus on increased participation of partner countries. In this regard, Member States agree to strengthen the United Nations Committee of Experts on International Cooperation in Tax Matters.

Mainstreaming women's empowerment into financing for development

While significant progress has been achieved in advancing gender equality in the MDG era, for example in primary school enrolment and access to healthcare for women and girls, more remains to be done. There are significant differences in pay for equal work, women remain underrepresented in government, and violence against women remains unacceptably common. The Action Agenda integrates gender considerations across all of its chapters. It emphasizes the importance of women's and girls' human rights and also stresses that women's empowerment can make a significant contribution to economic development for all. It commits countries to undertake legislation and administrative reforms to give women equal rights, and promotes gender-responsive budgeting and tracking among other measures.

Additional cross-cutting issues in the Action Agenda include scaling up efforts to end hunger and malnutrition, promoting inclusive and sustainable industrialization, full and productive employment and decent work for all, peaceful and inclusive societies, and protecting our ecosystem. The AAAA draws upon a broad range of financing and technological modalities and combinations of modalities, as well as promising new areas of international cooperation, to promote the delivery of the SDGs and the 2030 Agenda for Sustainable Development. It highlights a set of broad initiatives whose policy content is elaborated in more detail in the ensuing chapters.

- Source: United Nations Department of Economic and Social Affairs (DESA): Financing sustainable development and developing sustainable finance - A DESA Briefing Note on the Addis Ababa Action Agenda (2015)

B.1.2.4 REGIONAL STRATEGIC DEVELOPMENT IN AFRICA AND THE IMPORTANT ROLE OF STATAFRIC

At the African level, processes for promoting managing for results and the development of statistics capacity are well established. Since the 1990s, with the 1990 Addis Ababa Plan of Action for Statistical Development (AAPA), development of the capacity to produce, disseminate and use statistics has been a central theme. The evaluation of the AAPA in 2000 and the evaluations of national statistics systems of African Union (AU) member states that followed, led the way towards the development of the Reference Regional Strategic Framework for Statistical Capacity Building in Africa (RRSF) as a regional implementation framework for the Marrakech Action Plan for Statistics (MAPS) in 2006, the establishment of the Statistical Commission for Africa (STATCOM-Africa) in 2007 and the development of National Strategies for the Development of Statistics (NSDS) in the following years.

Further important milestones for the African Statistical System (ASS) were the adoption of the African Charter on Statistics (ACS) in February 2009 in Addis Ababa and the Strategy for the Harmonisation of Statistics in Africa (SHaSA) in July 2010 in Kampala, Uganda. The African Charter on Statistics provides a framework for development of policies and good practices for the development, production and use of statistics, in line with the UN Fundamental Principles for Official Statistics and other international principles and good practices. Accompanying this, the SHaSA was developed to guide the harmonisation of statistics in AU member states in areas such as concepts and definitions, adaptation of international or peer-agreed good practices (such as quality frameworks) and use of common methodologies for the production and dissemination of statistics. The purpose of the first version of SHaSA was to facilitate comparisons of statistics of AU member states across time through coordination and collaboration of national, regional and international stakeholders.

The revised Strategy for the Harmonization of Statistics in Africa (SHaSA 2) covers the period 2017-2026. It was adopted in January 2018 in Addis Ababa. SHaSA 2 responded to the growing demand for quality and up-to-date statistics for planning, monitoring and evaluation of Agenda 2063 and for the SDGs.

The African Statistics Day is an annual event celebrated on 18 November to raise public awareness of the importance of statistics in all aspects of social and economic life, highlighting that statistics remain a key element in the implementation of the development agenda and remain at the heart of the implementation of the African Union's 'Agenda 2063: the Africa we want'. On this day, the main actors of the African statistical system discuss the main themes for the development and harmonization of statistics in Africa.

The Africa-EU Strategic Partnership is the formal channel through which the European Union and the African continent work together. It is based on the Joint Africa-Europe Strategy adopted by Heads of State and Government at the second EU-Africa Summit in 2007.

Eurostat is involved in the implementation of large, multiannual EU financed statistical capacity building programmes aimed at strengthening the ability to produce good quality official statistics. Through the Pan African Statistics (PAS) programme, Eurostat assists the African Union Commission (AUC) to develop its statistical capacity at the African continental level. PAS was launched in 2016 as part of the broader Pan African Programme, in view of developing institutional and statistical capacity in the African Statistical System (ASS). The objectives of the programme build on the Strategy for the Harmonisation of Statistics in Africa 2 (SHaSA 2) and the African Charter on Statistics. The aims of the renewed Pan African Statistics Programme (PAS II), covering the period 2021-2025, are to continue to support African integration by strengthening the ASS, ensure the use of quality statistical data in the Africa integration decision-making process and policy monitoring and translate continental priorities at regional and national level. PAS II covers interventions at three levels: continental; regional; national. The support is delivered through online support, technical support missions, expert secondments, shadowing opportunities (e. g. National Statistical Office (NSO) to Africa, Africa to NSO), training and supporting material, provision of reusable solutions (e.g., data visualisations and digital publications). The implementation is flexible, through annual work programmes, and can thus quickly respond to important developments.

In 2013, the African Union decided to establish an African Union Statistical Institute (STATAFRIC) based in Tunis. The institute is at the centre of the promotion and production of harmonized official statistics in Africa. The Institute is an outcome of SHaSA's Strategic Objective 2, 'To establish an effective coordination mechanism', of Strategic Theme 2, 'To coordinate the production of quality Statistics for Africa'. STATAFRIC supports implementation of the provisions of SHaSA and the Charter. PAS II provides technical support to STATAFRIC. Support has been given among others for the update of the Strategic Plan for 2019-2023 in view of the Agenda 2063, SHaSA 2, the 2030 Agenda and other key strategies and agendas, as well as for a proposed roadmap to establish an action plan, a staffing strategy and a work programme for STATAFRIC.

Box B.1.4: Example: Kenya Vision 2030 implementation and M&E matrix

The Kenya Vision 2030 Program is Kenya's long-term development strategy, covering the period from 2008 to 2030. It aims to transform Kenya into "an industrialised upper middle income country offering a high quality of life to all its citizens by 2030".

The Vision 2030 is implemented through successive five-year Medium Term Plans. The first Medium Term Plan (MTP I) covered the period 2008-2012, The second (MTP II) the period 2013-2017 and the third (MTP III) the period 2018-2022.

The MTP III prioritised policies, programmes and projects which support the implementation of the "Big Four" initiatives:

- Raise the share of manufacturing sector to 15 per cent of GDP;
- Ensure that all citizens enjoy food security and improved nutrition by 2022;
- Achieve universal health coverage;
- Deliver at least five hundred thousand affordable housing units.

The implementation of the "Big Four" initiatives also aims to contribute to broad based inclusive sustainable economic growth, faster job creation and reduction of poverty and inequality.

The MTP III mainstreamed and implemented the 17 Sustainable Development Goals (SDGs) as outlined in the United Nations 2030 Agenda for Sustainable Development. It is also aligned to African Union's Agenda which constitute the strategic framework for socioeconomic transformation of the African continent by the year 2063.

The Kenya Vision 2030 framework is based on a 3-pillar structure:

- Economic pillar: "Moving the economy up the value chain"
- Social pillar: "Investing in the people of Kenya"
- Political pillar: "Moving to the future as one nation"

In addition, the MTP III covered the thematic areas HIV and AIDS and Climate change. The plan also specifically defined the statistical reforms and surveys to be carried out in the 5-year period covered.

In its Annex I, the MTP III provided the implementation matrix, outlining for each main programme or project within the different pillars and themes:

- Objectives
- Expected Output/Outcome
- Performance indicator(s)
- Implementing agencies
- Timeframe
- Source of funding
- Indicative budget (Total and by year)

For monitoring and evaluation of these programmes and projects, Annex II provided the details of each of the Performance indicators:

- Unit of measure
- Baseline (value 2016/2017)
- Mid-term projection (projected value 2020)
- End-term projection (projected value 2022)

Sources: Kenya Vision 2030 and the Kenya Vision 2030 Third Medium Term Plan (2018-2022): Transforming Lives: Advancing socio-economic development through the "Big Four"

To find out more…

International initiatives for the development of statistics

- OECD Development Assistance Committee (DAC) Joint Venture on Managing for Results: Sourcebook
- Marrakech Action Plan for Statistics (2004)
- Paris Declaration on Aid Effectiveness (2005) and the Accra Agenda for Action (2008)
- PARIS21: Dakar Declaration on the Development of Statistics (2008)
- Busan High Level Forum on Aid Effectiveness: Busan Action Plan for Statistics (2011)
- UN World Data Forum: Cape Town Global Action Plan for Sustainable Development Data (2017)
- UN World Data Forum: Dubai Declaration supporting the implementation of the Cape Town Global Action Plan for Sustainable Development Data (2018)
- UN World Data Forum: The Road to Bern – UN World Data Forum 2021

Financing for development

- United Nations Statistics Division (UNSD): Financing for Sustainable Development
- Addis Ababa Action Agenda (2015)
- United Nations Department of Economic and Social Affairs (DESA): Financing sustainable development and developing sustainable finance - A DESA Briefing Note on the Addis Ababa Action Agenda (2015)
- World Bank's Development Data Group: Statistical capacity building
- Bern Network on Financing Data for Development

Key resources and documents

- International Household Survey Network (IHSN)
- Accelerated Data Programme
- United Nations Population Fund (UNFPA)
- UN Statistics Division: World Programme on Population and Housing Censuses website
- UN Statistics Division: Census Knowledge Base
- PARIS21 - Partnership in Statistics for Development in the 21st Century
- PARIS21: Guidelines for developing statistical capacity – A roadmap for capacity development 4.0

Mainstreaming strategic planning of statistical systems – advocating for statistics

- PARIS21: Advocating for more and better funding of data
- PARIS21: Counting down poverty: The role of statistics in world development
- PARIS21: Measuring Up to the Measurement Problem: The role of statistics in evidence based policy-making

Regional strategies and capacity development in Africa

- African Charter on Statistics
- African Statistics Day (18 November each year)
- African Union: Strategy for the Harmonization of Statistics in Africa (SHaSA) and Strategy for the Harmonization of Statistics in Africa 2017-2026 (SHaSA 2)
- UN Economic Commission for Africa: Statistical Commission for Africa
- African Union: Conference of African Ministers responsible for Civil Registration
- African Union: Pan-African Institute for Statistics (STATAFRIC)
- African Union and European Union: Africa-EU Strategy
- European Commission and European External Action Service's Joint Communication: Towards a comprehensive strategy with Africa (JOIN(2020) 4 final)
- Eurostat: International cooperation – Pan African Statistics Program (PAS)
- Eurostat: Pan African Statistics Programme II, the 9th meeting of the Forum on African Statistical Development (FASDev) 14.12.2020
- Pan African Statistics (PAS) programme: Peer reviews of NSIs/NSSs in African countries: proposed methodology (draft) (2016)
- Pan African Statistics (PAS) programme: Pan African Statistics programme - presentation leaflet

B.1.3 Support for sustainable development data

B.1.3.1 HIGH-LEVEL GROUP FOR PARTNERSHIP, COORDINATION AND CAPACITY-BUILDING FOR THE 2030 AGENDA

The sustainable development agenda and the global monitoring framework put in place to measure and assess progress towards the SDGs have reinforced the need for relevant data at global level, and thus also for comparable and consistent data at regional and national level on which the global data can be based. However, such data do not come about by themselves. They require international standards and the institutional capacity at national and regional level to compile data in line with these standards.

SDG 17, 'Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development', refers directly to capacity building linked to data, monitoring and accountability in partner countries. Within SDG 17, this is specified in Target 17.18, 'By 2020, enhance capacity-building support to developing countries, including for least developed countries and small island developing States, to increase significantly the availability of high-quality, timely and reliable data disaggregated by income, gender, age, race, ethnicity, migratory status, disability, geographic location and other characteristics relevant in national contexts', as well as in Target 17.19, 'By 2030, build on existing initiatives to develop measurements of progress on sustainable development that complement gross domestic product, and support statistical capacity-building in developing countries'.

In response to this need to strengthen statistical capacity development, in particular in partner countries, the United Nations Statistical Commission established in 2015 the High-level Group for Partnership, Coordination and Capacity-Building for the 2030 Agenda (HLG-PCCB). The HLG-PCCB is made up of Chief Statisticians from 22 national statistical offices as representatives for the countries in their respective regions, with rotation every two years. The chair of the UN Statistical Commission is also a member, while representatives of regional commissions and regional and international agencies and others may be invited as issue partners. As of July 2021, three EU Member States (Bulgaria, Spain and Poland) are members of the HLG-PCCB. The mandate of the High-Level Group specifically calls for it to establish a global action plan for sustainable development data. In this function, the group should:

A. Provide strategic leadership for the Sustainable Development Goal implementation process as it concerns statistical monitoring and reporting within the framework of the Fundamental Principles of Official Statistics;

B. Promote national ownership of, and foster capacity-building, partnership and coordination for, the follow-up and review system of the 2030 Agenda for Sustainable Development, including to ensure consistency between national and global monitoring and reporting;

C. Recommend priority areas to target funding for statistical capacity-building and advocate for resource mobilization, management and monitoring;

D. Review and make recommendations as appropriate and in cooperation with the Inter-Agency and Expert Group on Sustainable Development Goal Indicators to facilitate modernization and harmonization of data infrastructures and identify ways to leverage the resources and creativity of the private sector;

E. Advise on how to harness the opportunities provided by the data revolution to support the Sustainable Development Goal implementation process, following up on the recommendations of the report entitled "A world that counts: mobilizing the data revolution for sustainable development" by the Secretary-General's Independent Expert Advisory Group on a Data Revolution for Sustainable Development, and taking into account the levels of development of the countries;

F. Promote engagement between the statistical community and other stakeholders working on the implementation and monitoring of globally agreed Sustainable Development Goals and targets;

G. Provide guidance on the content and organization of a world forum on sustainable development data, and lead the efforts of the global statistical community to reach out and cooperate with relevant stakeholders, including civil society, academia and the private sector.

The HLG-PCCB consults closely with the Inter-agency and Expert Group on SDG indicators (IAEG-SDGs) on statistical capacity development for the implementation of SDG indicators, and also engages with PARIS21, the regional development banks and other actors in order to maximise the effect and efficiency of international efforts for statistical capacity development.

B.1.3.2 UNITED NATIONS WORLD DATA FORUM

In its 2014 report 'A world that counts: mobilising the data revolution for sustainable development', the United Nations Secretary-General's Independent Expert and Advisory Group on Data Revolution for Sustainable Development recommended to set up a United Nations World Data Forum on Sustainable Development Data (UN World Data Forum) in order to bring together the whole data ecosystem to share ideas and experiences for data improvements, innovation, advocacy and technology transfer. The UN World Data Forum should provide a platform for intensified cooperation between the global statistical community and different professional groups, such as information technology experts, geospatial information managers, data scientists, and users, as well as civil society stakeholders. The HLG-PCCB's mandate specifically called on it to provide guidance on the content and organisation of such a forum.

The UN Statistical Commission supported the establishment of the UN World Data Forum, which met for the first time in Cape Town, South Africa, in January 2017. This first UN World Data Forum saw the launch of a global action plan

for sustainable development data, the Cape Town Global Action Plan for Sustainable Development. At the second UN World Data Forum in Dubai, United Arab Emirates, in 2018, the Dubai Declaration was presented, with participating parties committing to the implementation of the Cape Town Global Action Plan. The Dubai Declaration includes commitments to mobilise international and national funding to strengthen the technical and institutional capacities of national data and statistical systems and to establishing an innovative funding mechanism, open to all stakeholders, that is able to respond in a fast and efficient manner to the priorities of national data and statistical systems. The third UN World Data Forum was held in October 2021 in Bern, Switzerland. At this World Data Forum, the World Bank launched the new Global Data Facility funding mechanism for statistical capacity development. The Forum also saw the presentation of the Bern Network on Financing Data for Development.

B.1.3.3 CAPE TOWN GLOBAL ACTION PLAN FOR SUSTAINABLE DEVELOPMENT DATA

The Cape Town Global Action Plan for Sustainable Development Data was informally launched at the first UN World Data Forum on 15 January 2017 in Cape Town and adopted by the UN Statistical Commission in March 2017.

Since 2004, when the Marrakech Action Plan for Statistics was adopted, strategic planning has been a central tool for the development of national statistics development programmes, increasing political and financial support for statistics, and ensuring that countries have the required institutional capacity to produce the data and statistics needed for monitoring and evaluating their development outcomes.

The importance of accessible, timely and reliable data has been heightened by the needs for policy making and monitoring progress towards the SDGs. In particular, disaggregated data are vital in order to deliver on the Agenda 2030 promise 'to leave no one behind'. Increased support for strengthening data collection and capacity development are crucial to respond to this and to address data gaps for the SDG targets to better measure the progress.

The data revolution, with new sources of data, new formats and new technology, coupled with increased needs for information at all levels, requires the global statistical system to take decisive action to transform how data and statistics are produced and disseminated to inform development policy decisions. This calls for support of governments and closer partnerships with stakeholders from academia, civil society, the private sector, and the public at large.

At its meeting in January 2016, the HLG-PCCB agreed to develop a proposal for a Global Action Plan for Sustainable Development Data as a successor of the Busan Action Plan for Statistics from 2011. The aim of this new plan would be to outline the necessary actions to generate quality and timely data on a routine basis, in order to inform sustainable development at the requested level of disaggregation and population coverage, including for the most vulnerable and hard-to-reach groups. The plan is also intended to fully account, communicate, and coordinate existing efforts, as well as to identify new and strategic ways to efficiently mobilise resources.

The key principles of the Cape Town Global Action Plan for Sustainable Development Data are:

- Completeness of scope: it shall address all aspects of coordination, production and use of data for sustainable development, and describe necessary steps to modernise and strengthen statistical systems. The plan shall address short, middle and long-term actions, with particular focus on building the infrastructure and the capacity needed to support local, national, regional and global statistical requirements.
- Accountability: trust among data providers, producers and users of statistics is key for the effective functioning of the national, regional, and global statistical systems. Accordingly, the plan identifies national statistical systems, under the leadership of national statistical offices, as the necessary and appropriate leaders of this effort.
- Cooperation: cooperation among countries, regional organisations and other international organisations and stakeholders has a crucial role in supporting countries' plans and efforts in capacity building. The expertise and abilities of these key stakeholders are essential resources for progress and modernisation. Indeed, they have a crucial role in capacity building and in carrying out statistical capacity building efforts in their areas of work. However, the role of international organisations and regional entities in the development of methodologies and data must be conducted in full consultation and coordination with national statistical offices. Coordination and streamlining of these activities are necessary to avoid duplication of efforts.

The plan describes areas to address where there are important statistical capacity development needs and proposes key actions in each.

Box B.1.5: Cape Town Global Action Plan for Sustainable Development Data

Strategic Area 1: Coordination and strategic leadership on data for sustainable development

Objective 1.1: Strengthen national statistical systems and the coordination role of national statistical offices

Objective 1.2: Strengthen coordination among national statistical systems and regional and international organizations active in the production of data and statistics for sustainable development

Strategic Area 2: Innovation and modernization of national statistical systems

Objective 2.1: Modernize governance and institutional frameworks to allow national statistical systems to meet the demands and opportunities of constantly evolving data ecosystems

Objective 2.2: Modernize statistical standards, particularly those aimed to facilitate data integration and automation of data exchange across different stages of the statistical production process

Objective 2.3: Facilitate the application of new technologies and new data sources into mainstream statistical activities

Strategic Area 3: Strengthening of basic statistical activities and programmes, with particular focus on addressing the monitoring needs of the 2030 Agenda

Objective 3.1: Strengthen and expand household survey programmes, integrated survey systems, business and other economic survey programmes, population and housing census programmes, civil registration and vital statistics programmes and the International Comparison Programme taking into account the needs posed by the 2030 Agenda

Objective 3.2: Improve the quality of national statistical registers and expand the use of administrative records integrating them with data from surveys and other new data sources, for the compilation of integrated social, economic and environmental statistics and in relation to follow up on the 2030 Agenda

Objective 3.3: Strengthen and expand System of National Accounts and the System of Environmental Economic Accounts

Objective 3.4: Integrate geospatial data into statistical production programmes at all levels

Objective 3.5: Strengthen and expand data on all groups of population to ensure that no one is left behind

Objective 3.6: Strengthen and expand data on domains that are currently not well developed within the scope of official statistics

Strategic Area 4: Dissemination and use of sustainable development data

Objective 4.1: Develop and promote innovative strategies to ensure proper dissemination and use of data for sustainable development

Strategic Area 5: Multi-stakeholder partnerships for sustainable development data

Objective 5.1: Develop and strengthen partnerships of national and international statistical systems with governments, academia, civil society, private sector and other stakeholders involved in the production and use of data for sustainable development

Strategic Area 6: Mobilize resources and coordinate efforts for statistical capacity building

Objective 6.1: Ensure that resources are available to implement the necessary programmes and actions as outlined in this global action plan (both domestic and from international cooperation)

Source: Cape Town Global Action Plan for Sustainable Development Data

B.1.3.4 MANAGEMENT AND ORGANIZATION OF STATISTICAL SYSTEMS

The Global Conference on a Transformative Agenda for Official Statistics (2015) was organised jointly by the United Nations Statistics Division (UNSD) and Eurostat. The purpose of the conference was to seek a broad consensus on a strategic framework for statistics in support of the post-2015 development agenda and consider the management implications for the statistical system.

One of the key outcomes of this process was the complete revision and modernisation of the UNSD's Handbook on Statistical Organization. The new Handbook on Management and Organization of Statistical Systems (see the 'To find out more' box below) is a thorough update to the third edition of the UNSD's Handbook of Statistical Organization from 2003.

The UNSD highlights that the primary objective of the Handbook is to guide chief statisticians and senior managers of statistical organizations in how to develop and maintain statistical capacity that is fit for purpose. The Handbook aims to enhance the capacity of partner countries to strengthen the legal, institutional and organisational environments in which their statistical authorities operate. It also promotes the integrated and consistent planning of statistical production and development to address increased data needs across multiple statistical domains.

The Handbook provides descriptive information to guide and inform statistical organizations on important issues and topics, including new and emerging ones. It takes into account that national statistical systems and offices vary significantly in terms of size (human, financial and infrastructure), level of maturity or development (developing, developed, advanced), the extent of decentralisation (centralised, decentralised), but also the institutional environment in which producers of official statistics operate.

The Handbook is designed:

- to be used as a checklist that an NSO, or any other producer of official statistics, would take into consideration when managing and carrying out the various statistical processes involved in producing, analysing, and disseminating official statistics;
- to provide clear guidance that, with the exception of elements related to the UN Fundamental Principles of Official Statistics, is not prescriptive: the situation in each country is unique, and only those in the country can determine the usefulness of the guidance provided;
- to contribute to harmonisation and alignment of concurring definitions and terminology that have emerged recently through various, initiatives and programmes at the global and regional levels.

In discussing standards-based modernisation of the statistical production process, the Generic Statistical Business Process Model (GSBPM) is used as the organising framework. The discussion on the management of statistical activities is loosely based on the Generic Activity Model for Statistical Organizations (GAMSO), which is linked to the GSBPM. The Handbook cover the following main topics:

- Institutional and organizational frameworks that secure the resilience and the adaptability of official statistics;
- Communication, advocacy, and multi-stakeholder partnerships for official statistics;
- Production processes and data sources for integrated production systems in official statistics;
- Information technology infrastructure to support data collection and the sharing, processing, and dissemination of official statistics;
- Quality assurance frameworks, quality policy and quality management in official statistics;
- Capacity development, training, and resource mobilisation in official statistics.

The Handbook's Chapter 2, 'Official Statistics – a general overview', addresses chief statisticians and senior managers of statistical offices, as well as a broad range of users, data providers and stakeholders at all levels within and outside the national statistical system. It provides the essence of the main topics and critical issues dealt with in the other chapters of the Handbook:

- Official statistics
- The international dimension
- Basis of official statistics
- National statistical offices and national statistical systems
- The role of the chief statistician
- Statistical confidentiality
- Who are the users of official statistics?
- Maintaining close relations with users
- Data for official statistics
- Comparing modes of data acquisition
- Time and space dimensions of data
- Sustainable development indicators
- The statistical production processes
- Managing quality
- Disseminating and communicating the statistics
- International statistical cooperation
- The constant challenge of modernizing official statistics

Countries have found different ways of placing the NSO within their administrative structure and in a few cases as an autonomous agency outside the main branch of the executive. In most cases, the function of chief statistician is assigned to the head of the NSO.

Chapter 5, 'National statistical office', discusses various aspects of the NSO as an organization. It includes its vision, mission statement, core function, strategic planning, finance and administrative structures. It also discusses statistical business architecture, project management and various options for (re) organising the NSO.

Chapter 4, 'The National statistical system', further examines organizational issues for national statistical systems, derived from the principles and the definition of official statistics and how these principles are translated into institutional

safeguards for the various actors in official statistics. The chapter also discusses relationships between the NSO and other producers of official statistics; the ways NSSs are organised (the spectrum from centralised to decentralised, vertically and horizontally, etc.); legislative frameworks and governance; and the chief statistician's position and function. The data ecosystem within a country is broader than the national statistical system because it includes not only those producing official statistics but all producers and users of data in a country.

To find out more…

- High-level Group for Partnership, Coordination and Capacity-Building for statistics for the 2030 Agenda for Sustainable Development (HLG-PCCB)
- United Nations World Data Forum (UN WDF)
- UN World Data Forum: Cape Town Global Action Plan for Sustainable Development Data (2017)
- UN World Data Forum: Dubai Declaration supporting the implementation of the Cape Town Global Action Plan for Sustainable Development Data (2018)
- UN World Data Forum: The Road to Bern – UN World Data Forum 2021
- United Nations Secretary-General's Independent Expert Advisory Group on a Data Revolution for Sustainable Development (IEAG): A world that counts: mobilising the data revolution for sustainable development (2014)
- United Nations Statistics Division (UNSD): Handbook on Management and Organization of National Statistical Systems
- Generic Statistical Business Process Model (GSBPM)
- Generic Activity Model for Statistical Organizations (GAMSO)
- United Nations Statistical Commission: Transformative agenda for official statistics - Report of the Secretary-General (2017)
- Eurostat and UN Statistics Division (UNSD): Global Conference on a Transformative Agenda for Official Statistics (2015)

B.1.4. EU development policies and budget support

B.1.4.1 THE EUROPEAN CONSENSUS ON DEVELOPMENT AS A FRAMEWORK FOR DEVELOPMENT POLICY

The original European Consensus on Development from 2005 presented the European Commission's and EU Member States' common vision on development, responding to the challenges set by the Millennium Declaration and the MDGs, a critical element of the EU development approach.

However, despite the joint efforts of actors at all levels to reach the MDGs, profound global challenges remained in 2015, at the end of the period covered by the Millennium Declaration. Poverty and inequalities persisted, while many countries and regions experienced increasing instability and crises. Partner countries had become more diverse, while public goods had come under stress worldwide. At the same time, the international and EU framework for international cooperation and development underwent a major shift. 2015 saw the adoption of the Addis Ababa Action Agenda (AAAA) in July, the 2030 Agenda for Sustainable Development and the SDGs in September and the Paris Climate Agreement in December. As the world's largest development actor, the EU played an instrumental role in shaping the 2030 Development Agenda and the SDGs. At the EU level, 2009 saw the adoption of the Lisbon Treaty, while 2016 saw the adoption of the EU Global Strategy on Foreign and Security Policy. Sustainable development is one of the key elements of the EU's external action, as defined in the Lisbon Treaty and the Global Strategy.

The renewed European Consensus on Development from 2017 is the cornerstone of the European Union's revamped development policy. It is a central part of the EU's overall response to the 2030 Agenda, while also underlining the close relations between sustainable development and climate action and thus also reaffirming the EU's strong commitment to the Paris Agreement. The renewed European Consensus creates a shared framework for all EU institutions and Member States, providing a common approach to development policies. It guides the EU's cooperation with all partner countries, while recognising that the diversity of EU's partners in their social, political and economic structure is increasing and requires actions tailored to the partner country's own development agenda and strategies on a case-by-case basis.

The European Consensus translates the 2030 Agenda and SDG blueprint into EU development policies. Ending poverty in all its forms remains the EU's primary objective. In line with the central promise to 'leave no one behind', the EU and its Member States will work to reduce inequalities, address vulnerabilities and combat discrimination. The European Consensus provides a framework that promotes gender equality and social inclusion across EU policies, fosters opportunities for young people and improves people's wellbeing everywhere. In implementing the consensus, the EU is guided by and promotes its common principles,

including democracy, the rule of law, human rights, equality and solidarity, as well as its commitment to a rules-based global order.

The renewed consensus is based on the 'five Ps' of the 2030 Agenda, which overarch the 17 SDGs: People, Planet, Prosperity, Peace and Partnerships. These five Ps draw the interlinkages between different SDGs to light. The consensus promotes actions that meet multiple goals in a coherent way, with implementation requiring work across policies and sectors to boost synergies, address cross-cutting elements and thus accelerate transformation.

A core element of the consensus is the principle of policy coherence for development (PCD); development objectives should be fully taken into account across EU policies that are likely to affect partner countries. Policy coherence is a crucial element of the strategy to achieve the SDGs in the EU's partner countries and should be applied across all policies and all areas covered by the 2030 Agenda. In line with Article 208 of the Lisbon Treaty, the EU 'shall take account of the objectives of development co-operation in the policies that it implements which are likely to affect developing countries'. Within the EU's 'Better Regulation Toolbox' Tool 35 is dedicated to analysing the potential impact of important EU policy initiatives on partner countries. The 2019 EU Report on Policy Coherence for Development presented the state of play of the EU's efforts on "Delivering the SDGs in Europe and in the world".

Another core element of the consensus is the emphasis on the principles of development effectiveness and a results-based approach in order to increase the impact of the development cooperation. The EU and its Member States apply the development effectiveness principles agreed in the Global Partnership for Effective Development Cooperation (GPEDC): ownership of development priorities by partner countries, a focus on results, inclusive development partnerships, transparency and mutual accountability.

The EU strives to strengthen the effectiveness of its development cooperation by:

- defining its objectives based on the partner countries' own development priorities;
- supporting the policy processes through which these priorities are formulated, as well as the results frameworks established to manage and report on them;
- strengthening and building on partner countries' own systems to deliver on policy objectives and implement development programmes; and
- providing more of its support through coordinated aid modalities, such as budget support.

A third core element of the consensus is the commitment to Joint Programming. Joint programming improves overall aid coordination, coherence, and transparency. It reinforces mutual trust and knowledge between the EU, its Member States and other partners, while reducing donor fragmentation and transaction costs. At country level, Joint Programming in development cooperation increases the EU's and its Member States' collective impact by bringing together their resources and capacities. Partner country engagement, appropriation and ownership are essential for this process. Joint Programming should be led by the partner country's development strategy and aligned to the partner country's development priorities. The EU and its Member States work together to develop strategic responses grounded in shared knowledge, added value, lessons learned and joint analysis of the country context, including poverty and sustainability, and the country's overall relations with the EU. In doing so, they will take into account the available means for development financing, in line with the AAAA.

In order to keep track of the results of joint strategies, the EU international development and cooperation results framework was launched in 2015. This framework was revised in 2018 to align with the new European Consensus. The results framework defines a set of indicators to use for the collection, aggregation, and presentation of data, and serve as standards for the EU's yearly activity reports in partner countries. It helps identifying clear and measurable results and makes EU aid more accountable. In September 2023, the European Commission published a new study that provides a snapshot of how well the EU and its Member States are implementing the aid and development effectiveness principles in their ODA to partner countries.

Development cooperation includes all international public and private finance targeted at development outcomes, as well as domestic finance and policy. This includes not only official development assistance (ODA), but non-ODA climate finance, other official flows, South-South and triangular cooperation, funds and blended public/private finance, civil society actions and some non-financial co-operation including policy measures and private sector engagement. All of these resources should complement each other and work together as effectively as possible.

The consensus reaffirms that the EU and its Member States are fully committed to a comprehensive, transparent and accountable system of monitoring and review for the purpose of the implementation of the 2030 Agenda. The EU and its Member States will progressively adapt their reporting systems to be consistent with the 2030 Agenda's follow-up processes and indicators. They will improve the quality and availability of data on their development cooperation activities, across the 2030 Agenda. The EU and its Member States will also integrate the 2030 Agenda and support the use of SDG indicators to measure development results at country level. In particular, SDGs indicators can foster and facilitate a common EU results-oriented approach that favours harmonised results reporting at partner country level, including partner-country-level results frameworks, where they exist.

The consensus also confirms the commitment of the EU and its Member States to boost the statistical capacity of partner countries, including through strengthened capacity for the production and analysis of data, to inform policy and decision-making. These data should be disaggregated where possible by income, gender, age and other factors, and provide information on marginalised, vulnerable and hard-to-reach groups, inclusive governance and other issues, consistent with the EU's rights-based approach. It will also

include investments in stronger statistical institutions at sub-national, national and regional level, and the use of new technologies and data sources. The EU and its Member States will encourage their partner countries to include the voices of marginalised communities in monitoring the SDGs and to promote concrete mechanisms to this end.

B.1.4.2 EU BUDGET SUPPORT TO THIRD COUNTRIES

A significant share of EU aid is delivered in the form of budget support, and the EU is the world's top provider of budget support. It involves direct financial transfers to the national treasury of partner countries engaging in sustainable development reforms. These transfers are conditional on policy dialogue, performance assessment, and capacity building.

EU budget support promotes progress towards all SDGs, including reducing poverty (SDG 1) and promoting gender equality and empowerment of women (SDG 5). Countries receiving EU budget support perform better in controlling corruption than other partner countries (SDG 16).

The rules of EU budget support were set by the European Commission communication on 'The future approach to EU budget support to third countries' (COM(2011) 638). This Communication highlights the need for a coordinated approach at EU level, to ensure the effectiveness of this aid modality. It introduces budget support:

> *"Budget support involves policy dialogue, financial transfers to the national treasury account of the partner country, performance assessment and capacity-building, based on partnership and mutual accountability. It should not be seen as an end in itself, but as a means of delivering better aid and achieving sustainable development objectives by fostering partner countries ownership of development policies and reforms, as well as by implementing the aid effectiveness agenda ..."*

This initial framework has later been complemented by the EU's commitment to the 2030 Agenda and the Addis Ababa Action Agenda (2015). The renewed European Consensus on Development (2017) reiterated the importance of a coordinated approach to budget support. As the budget support is tailored to the development needs of the partner countries, specific objectives vary. However, they are always in line with the partner countries' own development policies, priorities, and objectives, and consistent with the EU's external action policy.

To benefit from budget support, partner countries need to adhere to EU fundamental values of human rights, democracy, and the rule of law. They must also have:

- relevant and credible national or sector strategies, policies, and/or reforms;
- stability-focused economic policies;
- a relevant and credible plan to improve public financial management and domestic revenue mobilisation;
- budget oversight and publicly available budget information

The 'Future approach to EU budget support' Communication provides three different categories of budget support contracts. The choice of contract category depends on the specific partner country's context and own development objectives:

- **Sustainable Development Goals Contracts (SDG-Cs)** are meant to support the partner countries' own efforts to achieve several SDGs. They support high-level strategic development objectives, which require a comprehensive and transversal approach. SDG-Cs can only be assigned after a satisfactory assessment of the partner government's commitment to EU fundamental values.
- **Sector Reform Performance Contracts (SRPCs)** focus on sector policies and reforms to improve governance and service delivery. They focus on one or a few SDGs. They support the partner countries' efforts to ensure inclusive access to qualitative public services, promote women's and children's rights, and create the conditions for sustainable growth at sector level.
- **State and Resilience Building Contracts (SRBCs)** are used in fragile contexts. They support the most fragile partner countries' transition towards recovery, development, and democracy and help them address the structural causes of their fragility. They can also be deployed right after a crisis or a natural disaster. Eligibility criteria for SRBCs are the same, but they are assessed using a forward-looking approach. A strong policy dialogue –and safeguard measures when necessary– is a pillar of SRBCs. SRBCs typically address several SDGs. SRBCs usually prepare the ground for SDG-Contracts and SRPCs, as they support the formulation of national or sectoral development strategies in the partner countries.

Box B.1.6: Budget support and the fight against corruption and fraud

Financial transfers under budget support are tied to performance. If a partner country does not meet the agreed-upon conditions for results, payments will be withheld until they do. The use of a variable tranche based on indicators also allows for partial payment in case of partial performance. Budget support encourages an accountable and effective public administration, contributing to the fight against corruption and fraud through:

- assistance to audit and anti-corruption institutions or judicial bodies;
- strengthened political/policy dialogue on transparency and oversight functions;
- reforms to fix systemic weaknesses favouring corruption in revenue administration, spending and procurement processes or in service delivery;
- support for civil society organisations to enable participation and oversight in the budgetary and policy process.

Budget support contributes creation of a favourable climate for private investments in the partner countries. Thus, budget support also helps partner countries mobilise domestic revenue and depend less on external aid in the long run.

The European Union generally provides budget support using a combination of fixed tranches linked to eligibility criteria, and variable tranches that are also linked to progress in meeting agreed targets in for example health, education, or public financial management. The European Commission's Budget Support Guidelines were updated in September 2017, reflecting the orientations set out in the renewed European Consensus on Development.

The partner country should have a well-functioning system in place for monitoring progress and reporting on performance, both at general and at sector policy level. Reliable information, based on quality statistics, is required to create an informed baseline. Progress is assessed against results data that should be reliable as it triggers disbursements. Where weaknesses are identified, actions should be agreed with the government and other cooperation partners to strengthen statistical, monitoring, and reporting systems. EU Delegations should pay particular attention to:

- the institutional setup and the functioning of statistical systems in the country and more particularly in the sector(s) covered by the contract;
- the monitoring and evaluation systems and/or the performance assessment framework linked to the policy; and
- the timeliness, regularity, quality and reliability of official statistics, public data and reporting documents as well as the extent of publication and dissemination.

To find out more…

about European Commission development policies:

- Shared vision, common actions: a stronger Europe. Global strategy for the European Union's foreign and security policy (2016)
- European Commission – DG International Partnerships: European development policy; see in particular the sections on the European Consensus on Development, Development effectiveness, Joint Programming, and Policy coherence for development
- European Commission: EU report on Policy Coherence for Development (2019)
- European Commission – DG International Partnerships: Aid transparency; Strategic evaluations – Assessing the quality of EU development aid; Project and programme evaluations
- European Commission: Better Regulation Toolbox chapter 3 (which contains, among other things, Tool #35 Developing countries
- Global Partnership for Effective Development Cooperation: Effective development cooperation – Does the EU deliver?

about European Commission budget support:

- European Commission Communication COM(2011) 638 final: 'The future approach to EU budget support to third countries' (2011)
- European Commission – DG International Partnerships: Budget Support Guidelines (2017)
- European Commission – DG International Partnerships: Budget support
- European Commission – DG International Partnerships: Budget support – Trends and results 2023
- European Commission: Collect more – Spend better: Achieving development in an inclusive and sustainable way

B.2 How statistics are made

B.2. How statistics are made

The chapter in brief

The chapter presents an overview of what constitutes official statistics, how they are produced and how they are disseminated. It addresses the following issues:

- Principles of statistics production and the consequent legal framework for official statistics
- Overview of statistics operations from analysis and design to dissemination of results
- Structure of the National Statistical System, how it organises statistics production and how it relates to users of statistics
- Briefing on the role of regional and international organisations in producing statistics and in standardising concepts and methods

B.2.1. Official statistics and their fundamental principles

B.2.1.1 DEFINING OFFICIAL STATISTICS

Official statistics are statistics produced and disseminated by the specialised public organisations that make up the national and international statistical systems[1]. Official statistics are available publicly, freely or at relatively low cost; they aim to be a unique, definitive and generally accepted public measure and record of an economic, social or environmental condition. Areas of interest can be social, economic, environmental, or other subjects relevant to public policy. Examples of official statistics include numbers of children born, numbers of unemployed people and measures of the quality of water etc. Basic commentary on data that explains the main features of the latest data (metadata) is often included in official statistics publications.

Official statistics, also called 'public statistics', are used to design, implement, monitor, and evaluate public policies. Official statistics are published in many forms such as summary publications for the non-specialist public; press releases that can make newspaper headlines and affect financial markets; and large, detailed databases for further analysis by specialists. In recent years, the Internet has become a primary means of dissemination of statistics.

In contrast to official statistics, unofficial, private or internal statistics are not necessarily publicly available or may be published at high cost for a specialist audience. Unofficial statistics often do not aim at being unique and definitive; their methodologies can be unpublished. Opinion polls, market research and company production data are examples of unofficial statistics.

Most official statistics are 'descriptive statistics': numbers that represent observed measurements of a state or condition of a 'population'. A population can consist, for example, of all persons, businesses or land areas in a country. The individual entities that make up the population are known as 'population units'.

Descriptive statistics also include 'metadata': information about the data. Metadata[2] consists of:

- Concepts: the characteristics, definitions, and descriptions of observations or of a series of observations taken over time (time-series), including classifications
- Methods: analysis and accounts of how the data is collected and processed. In surveys, the most important element is the sample methodology, which describes how the population was observed statistically.

Metadata about official statistics are published, sometimes in manuals of 'sources and methods'. The methods used to prepare the official statistics are therefore transparent. Unofficial statistics producers may or may not publish the methodology used.

In contrast to 'descriptive statistics', 'theoretical statistics' make statements that infer relationships such as causes or forecasts of future trends in data. Because these studies hypothesise causal relationships, they are generally contestable and cannot aim at being unique and definitive measurements in the same way as official statistics. For this reason, economic forecasts, social analyses and environmental projections are usually worked on outside national statistics institutes, even though they are often based on official statistics. Economists, social scientists and environmentalists are therefore more often seen as users of official statistics than as producers. Official statistics are in certain circumstances based on statistical inferences (theoretical statistics). Examples include estimating missing data values, short-term forecasts and estimation for the total population based on sample survey data.

1 Excluding any publications that are explicitly stated not to be official.

2 See also: European Statistical System Handbook for Quality and Metadata Reports, re-edition 2021. Manuals and Guidelines. Eurostat.

The range of official statistics can be classified by broad subject area. This is Eurostat's classification::

Theme1: General and Regional Statistics
Theme 2: Economy and Finance
Theme 3: Population and social conditions
Theme 4: Industry, trade and services
Theme 5: Agriculture and fisheries
Theme 6: International trade
Theme 7: Transport
Theme 8: Environment and energy
Theme 9: Science, technology, and digital society

Some statistics are used in more than one subject area: for example, water quality data are used for both social and environmental indicators.

To find out more…

About the range of official statistics and metadata, see Eurostat's website at:
https://ec.europa.eu/eurostat

- Eurostat: Quality
- Eurostat: European Statistical System handbook for quality and metadata reports, re-edition 2021
- Eurostat: Quality reporting
- Eurostat: European Statistics Code of Practice – revised edition 2017
- Eurostat: Peer reviews, monitoring of compliance with the Code of Practice
- European Statistical System: Quality Assurance Framework of the European Statistical System (ESS QAF) – version 2.0 (2019 edition)
- Eurostat: Eurostat quality initiatives: Eurostat's internal dissemination error management policy; Protocol on impartial access to Eurostat data for users; Quality reviews

B.2.1.2 THE FUNDAMENTAL PRINCIPLES OF OFFICIAL STATISTICS

The international community of statisticians has agreed on ten 'fundamental principles' with which official statistics must comply to correctly inform the public. These principles were adopted in 1994 by the United Nations Statistical Commission. The principles state that all organisations that are responsible for producing official statistics must:

- Compile and disseminate them in an impartial manner.
- Select their methods based on purely professional considerations (strict scientific principles and ethical rules).
- Ensure the protection of personal data collected from individuals and enterprises.

Box B.2.1: The UN's Fundamental Principles of Official Statistics

Principle 1. Official statistics provide an indispensable element in the information system of a democratic society, serving the Government, the economy and the public with data about the economic, demographic, social and environmental situation. To this end, official statistics that meet the test of practical utility are to be compiled and made available on an impartial basis by official statistical agencies to honour citizens' entitlement to public information.

Principle 2. To retain trust in official statistics, the statistical agencies need to decide according to strictly professional considerations, including scientific principles and professional ethics, on the methods and procedures for the collection, processing, storage and presentation of statistical data.

Principle 3. To facilitate a correct interpretation of the data, the statistical agencies are to present information according to scientific standards on the sources, methods and procedures of the statistics.

Principle 4. The statistical agencies are entitled to comment on erroneous interpretation and misuse of statistics.

Principle 5. Data for statistical purposes may be drawn from all types of sources, be they statistical surveys or administrative records. Statistical agencies are to choose the source with regard to quality, timeliness, costs and the burden on respondents.

Principle 6. Individual data collected by statistical agencies for statistical compilation, whether they refer to natural or legal persons, are to be strictly confidential and used exclusively for statistical purposes.

Principle 7. The laws, regulations and measures under which the statistical systems operate are to be made public.

Principle 8. Coordination among statistical agencies within countries is essential to achieve consistency and efficiency in the statistical system.

Principle 9. The use by statistical agencies in each country of international concepts, classifications and methods promotes the consistency and efficiency of statistical systems at all official levels.

Principle 10. Bilateral and multilateral cooperation in statistics contributes to the improvement of systems of official statistics in all countries.

Source: UN Fundamental Principles of Official Statistics (2014)

The European Statistics Code of Practice is based on the United Nations' 'fundamental principles' and develops them further. The 2017 revision of the European Code of Practice comprises 16 principles and a set of indicators of good practices with each principle, covering the institutional environment, statistical processes and outputs. The European Union's institutions involved with statistics, notably Eurostat, are committed to respect this code and to periodically assess its application through good practice indicators and a detailed questionnaire developed by Eurostat in cooperation with the EU National Statistical Institutes. Information on compliance with the code by statistical authorities is published on the Eurostat website.

Box B.2.2: The Principles of the European Statistics Code of Practice, 2017 revision

Institutional environment

Principle 1: Professional Independence - The professional independence of statistical authorities from other policy, regulatory or administrative departments and bodies, as well as from private sector operators, ensures the credibility of European Statistics.

Principle 1bis: Coordination and cooperation - National Statistical Institutes and Eurostat ensure the coordination of all activities for the development, production and dissemination of European statistics at the level of the national statistical system and the European Statistical System, respectively. Statistical authorities actively cooperate within the partnership of the European Statistical System, so as to ensure the development, production and dissemination of European statistics.

Principle 2: Mandate for Data Collection and Access to Data - Statistical authorities have a clear legal mandate to collect and access information from multiple data sources for European statistical purposes. Administrations, enterprises and households, and the public at large may be compelled by law to allow access to or deliver data for European statistical purposes at the request of statistical authorities.

Principle 3: Adequacy of Resources - The resources available to statistical authorities are sufficient to meet European Statistics requirements.

Principle 4: Commitment to Quality - Statistical authorities are committed to quality. They systematically and regularly identify strengths and weaknesses to continuously improve process and output quality.

Principle 5: Statistical Confidentiality and Data Protection - The privacy of data providers, the confidentiality of the information they provide, its use only for statistical purposes and the security of the data are absolutely guaranteed.

Principle 6: Impartiality and Objectivity - Statistical authorities develop, produce and disseminate European Statistics respecting scientific independence and in an objective, professional and transparent manner in which all users are treated equitably.

Statistical Processes

Principle 7: Sound Methodology - Sound methodology underpins quality statistics. This requires adequate tools, procedures and expertise.

Principle 8: Appropriate Statistical Procedures – Appropriate statistical procedures, implemented throughout the statistical processes, underpin quality statistics.

Principle 9: Non-Excessive Burden on Respondents - The response burden is proportionate to the needs of the users and is not excessive for respondents. The statistical authorities monitor the response burden and set targets for its reduction over time

Principle 10: Cost Effectiveness - Resources are used effectively..

Statistical Output

Principle 11: Relevance - European Statistics meet the needs of users.

Principle 12: Accuracy and Reliability - European Statistics accurately and reliably portray reality.

Principle 13: Timeliness and Punctuality - European Statistics are released in a timely and punctual manner.

Principle 14: Coherence and Comparability - European Statistics are consistent internally, over time and comparable between regions and countries; it is possible to combine and make joint use of related data from different data sources.

Principle 15: Accessibility and Clarity – European Statistics are presented in a clear and understandable form, released in a suitable and convenient manner, available and accessible on an impartial basis with supporting metadata and guidance.

Source: European Statistical System: European Statistics Code of Practice – revised edition 2017

The African Charter on Statistics is based on the UN fundamental principles and requires the statistics system of Africa to adopt and respect them. In April 2008, the Conference of African Ministers of Economy and Finance, jointly arranged by the African Union and the UN Economic Commission for Africa, approved the draft Charter. On 3 February 2009, the Charter was adopted by African Heads of State and Government. The charter officially entered into force in May 2014 when the required number of countries had ratified it.

The African Union Commission has developed guidelines and indicators to assess how far the principles of the Charter on Statistics are implemented in its member states; an action plan for implementation has also been developed. A study on the implementation by the member states showed that the countries that responded to the self-assessment questionnaire are implementing the principles of the Charter well. However, there are still some gaps when it comes to implementing the sub-principles and the level of implementation varies across the six principles of the Charter.

Box B.2.3: The principles of the African Charter on Statistics

Principle 1: Professional independence

Scientific independence: Statistics authorities must be able to carry out their activities according to the principle of scientific independence, particularly vis-à-vis political authorities or interest groups.

Impartiality: Statistics authorities shall produce, analyse, disseminate, and comment on African statistics in line with the principle of scientific independence, and in an objective, professional and transparent manner.

Responsibility: Statistics authorities and African statisticians shall employ unambiguous and relevant methods in the collection, processing, analysis and presentation of statistical data. Statistical authorities shall also have the right and duty to make observations on erroneous interpretation and improper use of the statistical information that they disseminate.

Transparency: To facilitate proper interpretation of data, Statistics authorities shall provide information on their sources, methods and procedures that have been used in line with scientific standards. The domestic law governing operation of the statistical systems must be made public.

Principle 2: Quality

Relevance: African statistics shall meet the needs of users.

Sustainability: African statistics shall be conserved as detailed as possible to ensure their use by future generations, while preserving the principles of confidentiality and protection of respondents.

Data sources: Data used for statistical purposes may be collected from diverse sources such as censuses, statistics surveys and/or administrative records. The statistics Organizations shall choose their sources in consideration of the quality and topicality of data, particularly the costs incurred by the respondents and sponsors. The use by statistics authorities of administrative records for statistical purposes shall be guaranteed by domestic law, provided that confidentiality is preserved.

Accuracy and reliability: African statistics shall be an accurate and reliable reflection of the reality.

Continuity: Statistics authorities shall ensure continuity and comparability of statistical information over time.

Coherence and comparability: African statistics shall be internally coherent over time and allow for comparison between regions and countries. To this end, these statistics shall make combined use of related data derived from different sources. It shall employ internationally recognized and accepted concepts, classifications, terminologies and methods.

Timeliness: African statistics shall be disseminated in good time and, as far as possible, according to pre-determined calendar.

Topicality: African statistics shall reflect current and topical events and trends.

Specificities: Statistical data production and analytical methods shall take into account African peculiarities.

Awareness-building: State Parties shall sensitize the public, particularly statistical data providers, on the importance of statistics.

Principle 3: Mandate for data collection and resources

Mandate: Statistics authorities shall be endowed with a clear legal mandate empowering them to collect data for production of African statistics. At the request of statistics authorities, public administrations, business establishments, households and the general public may be compelled by domestic law to allow access to their data or provide data for the compilation of African statistics.

Resource Adequacy: As far as possible, the resources available to Statistics authorities shall be adequate and stable to enable them to meet statistics needs at national, regional and continental levels. Governments of States Parties shall have the primary responsibility to provide such resources.

Cost-effectiveness: Statistics authorities shall use the resources so provided effectively and efficiently. This presupposes, in particular, that operations shall as far as possible, be programmed in an optimal manner. Every effort shall be made to achieve improved production and use of the statistics derived from administrative records, to reduce the costs incurred by respondents and, as far as possible, avoid expensive direct statistical surveys.

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Box B.2.3: The principles of the African Charter on Statistics (continued)

Principle 4: Dissemination

Accessibility: African statistics shall not be made inaccessible in any way whatsoever. This concomitant right of access for all users without restriction shall be guaranteed by domestic law. Micro-data may be made available to users on condition that the pertinent laws and procedures are respected and confidentiality is maintained.

Dialogue with users: Mechanisms for consultation with all African statistics users without discrimination shall be put in place with a view to ensuring that the statistical information offered are commensurate with their needs.

Clarity and understanding: Statistics shall be presented in a clear and comprehensible form. They shall be disseminated in a practical and appropriate manner, be available and accessible to all and accompanied by the requisite metadata and analytical commentaries.

Simultaneity: African Statistics shall be disseminated in a manner that ensures that all users are able to use them simultaneously. Where certain authorities receive advance information under embargo, to allow them time to respond to possible questions, public announcement shall be made indicating the nature of such information, the identity of the recipients and the set timeframe before its public dissemination.

Correction: Statistics authorities shall correct publications containing significant errors using standard statistical practices or, for very serious cases, suspend dissemination of such statistics. In that event, users shall be informed in clear terms of the reasons for such corrections or suspension.

Principle 5: Protection of individual data, information sources and respondents

Confidentiality: National Statistics authorities, African statisticians and all those operating in the field of statistics in Africa shall absolutely guarantee the protection of the private life and business secrets of data providers, the confidentiality of the information so provided and the use of such information for strictly statistical purposes.

Giving assurances to Data providers: Persons or entities interviewed during statistical surveys shall be informed of the objective of such interviews and of the measures put in place to protect the data provided.

Objective: Data concerning individuals or entities collected for statistical purposes shall in no circumstance be used for judicial proceedings or punitive measures or for the purpose of taking administrative decisions against such individuals or entities.

Rationality: Statistics authorities shall not embark upon statistical surveys except where pertinent information is unavailable from administrative records or the quality of such information is inadequate in relation to the quality requirements of statistical information..

Principle 6: Coordination and Cooperation

Coordination: Coordination and collaboration amongst Statistics authorities in a given country are essential in ensuring quality and harmonious statistical information. Similarly, coordination and dialogue amongst all Members of the African Statistical System are vital for harmonization, production and use of African statistics.

Co-operation: Bilateral and multilateral statistics cooperation shall be encouraged.

Source: African Charter on Statistics (2009)

In November 2011, the Statistical Conference of the Americas (SCA –ECLAC) adopted the 'Code of Good Practice in Statistics for Latin America and the Caribbean'. It aims at being a technical and regulatory instrument contributing to the improvement of national statistical activities and systems across the region. This Code of Practice is structured by 17 principles and associated best practices. It has been inspired by the European Statistics Code of Practice as an example of good statistical practices. The Code of Good Practice in Statistics for Latin America and the Caribbean also addresses issues of specific relevance to the national statistical systems in the region. Specifically, this concerns the principle on coordination of national statistical systems, as well as the principle of cooperation and international participation. For each of the 17 principles of the Code of Practice, compliance criteria have been defined; the number of compliance criteria varies between principles.

Following up the implementation of the Code of Good Practice in Statistics for Latin America and the Caribbean, a self-assessment questionnaire was developed for 10 principles of the Code of Practice, in order to assess the current status, strengths, weaknesses and improvement actions concerning the institutional environment and coordination, statistical processes and statistical outputs in the NSIs of the region. The results of this study have been presented in the 'Report on strengths, weaknesses and improvement actions found in the self-assessment questionnaire measured against the principles of the Regional Code of Practice in Statistics for Latin America and the Caribbean'.

Box B.2.4: The Code of Good Practice in Statistics for Latin America and the Caribbean

Principle 1 - Professional independence: In order to guarantee the credibility of official statistics, the national statistical institute and other members of the national statistical system must be professionally independent of political and administrative agencies and other external sources of interference.

Principle 2 - Coordination of the national statistical system: This will enable the statistics producing entities to plan and implement national statistical activity in a participatory manner, maintain close contact and work jointly to improve the quality, comparability and consistency of official statistics.

Principle 3 - Statistical mandate for data collection: The collection of information for the preparation of official statistics must be supported by a clear legal mandate. At the request of the national statistical institutes and members of the national statistical system, the administrations, corporations, households and the public in general may be required by law to provide access to data for the preparation of official statistics or to submit such data, which will be treated as confidential.

Principle 4 - Statistical confidentiality: The national statistical institute and the other members of the national statistical system shall guarantee the protection and confidentiality of the information used to produce official statistics and shall refrain from identifying the sources.

Principle 5 - Adequacy of resources: The resources available for national statistical activity must be sufficient and appropriate for the generation of official statistics.

Principle 6 - Quality commitment: The entities that produce statistics within the national statistical system must work and cooperate in accordance with rules, principles and standards.

Principle 7 - Impartiality and objectivity: The national statistical institute and the other members of the national statistical system must produce and disseminate official statistics respecting scientific independence and in an objective, professional and transparent manner, so that all users are treated equally.

Principle 8 - Cooperation and international participation: The entities belonging to the national statistical system must cooperate in the exchange of experiences and information and work jointly on the preparation of international statistical standards and activities.

Principle 9 - Sound methodology: The production of official statistics by the national statistical institute and the other members of the national statistical system must be based on sound instruments, procedures and expertise.

Principle 10 - Appropriate statistical procedures: The quality of official statistics used by national statistical institute and the other members of the national statistical system must be underpinned by appropriate procedures and tools at every stage of the statistical process.

Principle 11 - Non-excessive burden on respondents: The national statistical institute and the other members of the national statistical system must set their targets so as to gradually reduce the burden on respondents. The request for information must be in keeping with the needs of users and must not be excessive for the respondents.

Principle 12 - Cost-effectiveness: The national statistical institute and the other members of the national statistical system must use resources efficiently and effectively.

Principle 13 - Relevance: The national statistical institute and other members of the national statistical system must satisfy users' information needs on the basis of their requirements.

Principle 14 - Accuracy and reliability: The official statistics produced by the national statistical institute and the other members of the national statistical system must be an accurate and reliable reflection of the actual situation.

Principle 15 - Timeliness and punctuality: The national statistical institute and the other members of the national statistical system must produce and disseminate official statistics in a timely, punctual and transparent manner.

Principle 16 - Coherence and comparability: The official statistics produced by the national statistical institute and the other members of the national statistical system must be coherent internally and over time and must be comparable across regions and countries.

Principle 17 - Accessibility and clarity: The official statistics generated by the national statistical institute and the other members of the national statistical system must be presented clearly and comprehensibly and disseminated appropriately, thereby enabling equitable access by all users.

Source: Code of Good Practice in Statistics for Latin America and the Caribbean (2011)

International organisations involved in the production and dissemination of statistics, principally UN agencies, similarly adopted Principles Governing International Statistical Activities in 2005. Once again, these are based on the 'fundamental principles'.

The International Statistical Institute (ISI), an independent professional association of statisticians, has drawn up a Declaration on professional ethics for statisticians. The aim of this declaration is to let the statistician's individual ethical judgments and decisions to be led by shared values and experience, rather than by rigid rules imposed by the profession. The declaration documents widely held principles of statistical inquiry and identifies factors that hamper their use.

To find out more…

- UN Fundamental Principles of Official Statistics (2014)
- European Statistics Code of Practice (revised edition 2017) and Eurostat quality website
- African Charter on Statistics (2009)
- Code of Good Practice in Statistics for Latin America and the Caribbean (2011) and Report on strengths, weaknesses and improvement actions found in the self-assessment questionnaire measured against the principles of the regional code of practice in statistics for Latin America and the Caribbean (2011)
- United Nations Statistics Division: Principles Governing International Statistical Activities (2005)
- International Statistical Institute: Declaration on professional ethics (2010)

B.2.1.3 LEGAL FRAMEWORK FOR STATISTICS

The legal framework for the powers and responsibilities of government, individuals and private organisations concerning the collection and publication of statistical information is known as a 'Statistics law'. Most countries have adopted laws and other regulatory instruments that define the conditions in which activities relating to official statistics will be carried out. In principle, statistical law should conform to and implement the UN fundamental principles of official statistics.

Statistics law therefore generally covers the following areas:

- Authorisation and responsibility for collection and publication of statistical data: hence the organisation and functioning of the National Statistical System (NSS) and National Statistical Institute (NSI);
- Independence of statistical activity from political authorities;
- Obligation on individuals and organisations to reply truthfully to official surveys and censuses;
- Dissemination rules and confidentiality of statistical data, including exchange of statistical information within the public administration;
- Programming procedures, including a requirement for broad stakeholder consultation and transparency.

The existence of adequate statistics legislation and its implementation are key conditions for the development of official statistics. Effective implementation requires stakeholders to accept that the statistical law is a prerequisite for disseminating quality statistics that respond to users' needs. Missing or poorly implemented statistical legislation may create a number of problems, which can seriously influence the quality of the statistics:

- Undefined responsibility for authorising statistical activities can result in parallel activities being undertaken by different authorities. This in turn can mean additional administrative burden on respondents, inefficient use of public funds and multiple statistical publications.
- Dependence of statistics institutes on political authorities can result in statistical data being released late or not at all or being subject to manipulation.
- Without a guarantee of confidential treatment of responses, individuals and organisations may refuse to answer surveys for fear of the possible consequences, for example on their taxation. This can occur even if there are effective penalties for survey non-response.

Statistics legislation exists within a national legal and administrative framework. Since these structures can differ greatly between countries for historical reasons, there can be no single approach to the development of statistical legislation and to the organisation of administrative structures producing statistics. Whatever approach is adopted, it should conform to the UN fundamental principles of official statistics and to any regional frameworks based on them. International organisations involved in the production and dissemination of statistics, principally UN agencies, similarly adopted Principles Governing International Statistical Activities in 2005. Once again, these are based on the 'fundamental principles'.

The UN Handbook of Statistical Organisation gives guidance on the legal structure.

A good example of modern statistical legislation is Regulation of the European Parliament and of the Council on European Statistics No 223/2009, also known as the 'Statistical Law' in Europe. In particular, the Statistical Law states that European statistics shall be produced according to the principle of subsidiarity, independence, integrity and accountability of the statistical authorities. It also gives reference to the European Statistics Code of Practice and defines quality principles.

The Statistical Law defines the European Statistical System (ESS): It gives Eurostat a coordinating role on EU level and the NSIs on a national level. Eurostat is also responsible for the coordination of statistical activities of all EU institutions. The Statistical Law gives Eurostat flexibility to respond to future challenges, such as rapidly emerging policy needs, also outside the five-year statistical programmes. At the same time, it provides a stable and transparent legal basis.

In the context of the African Charter for Statistics, a model statistics law for African countries has been developed. Although most African countries have a statistics law, many of these were adopted before the African Charter for Statistics was conceived. This model statistics law enables the countries to align their legislation with the principles of the Charter when reviewing the existing statistics law or developing a new statistics law.

Generic laws on official statistics have also been developed in other regions, such as the model laws prepared by the UNECE ('Generic Law on Official Statistics for Eastern Europe, Caucasus and Central Asia'; 2016) and the Statistical Conference of the Americas of ECLAC ('Generic Law on Official Statistics for Latin America'; 2019).

In recent years, substantial efforts have been undertaken to modernise official statistics. The research was launched by a community of statisticians, involving key actors such as Eurostat, the OECD and UNECE, but also national statistical organisations. The work has been driven forward by the 'High-Level Group for the Modernisation of Official Statistics' (HLGMOS). The HLG-MOS' working group for supporting standards (develop, promote and support the implementation

of statistics standards) has developed several inter-related tools that define how statisticians all over the world envisage their work and the collaboration among them and with partners in the statistical system.

The HLG-MSO has developed a tool that standardises the activities of the statistical organisations. 'The Generic Activity Model for Statistical Organisations' (GAMSO) describes and defines the activities that take place within a typical organisation that produces official statistics. An initial version of the tool was released in 2015 and a revision was carried out in 2019 (version 1.2). GAMSO develops around four levels:

- The first level (production) is already covered by the 'Generic Statistical Business Process Model' (GSBPM);
- The second level covers activities that enable the organisation to undertake new activities, or to improve the efficiency of existing ones (such as research, development and innovation activities concurring to the development of capabilities);
- The third level includes all the cross-cutting activities required by the organisation to deliver its work programme efficiently and effectively (including business performance and legislation);
- The fourth level addresses the high-level strategy of the organisation and its ability to deliver the products and the services demanded.

To find out more…

- United Nations Statistics Division (UNSD): Handbook on Management and Organization of National Statistical Systems
- Regulation (EC) No 223/2009 on European Statistics ('European Statistical Law') (2009)
- Eurostat: European Statistical system (ESS) website
- African Union: Model Statistics Law in the Context of the African Charter on Statistics
- United Nations Economic Commission for Europe (UNECE): Generic Law on Official Statistics for Eastern Europe, Caucasus and Central Asia (2016)
- Statistical Conference of the Americas of the Economic Commission for Latin America and the Caribbean (ECLAC): Generic Law on Official Statistics for Latin America (2019)
- United Nations Statistics Division: Principles Governing International Statistical Activities (2005)
- International Statistical Institute: Declaration on professional ethics (2010)
- Conference of European Statisticians: High-Level Group for the Modernisation of Official Statistics
- High-Level Group for the Modernisation of Official Statistics: Generic Activity Model for Statistical Organisations (GAMSO)
- Eurostat: European Statistical System Handbook for Quality and Metadata Reports, re-edition 2021

B.2.2 The statistical process

B.2.2.1 MAIN TYPES OF STATISTICAL OPERATIONS

Official statistics are derived from various sources. Traditionally, the basic distinction is between **administrative** and **survey** data collection. In the former, data is collected without direct contact with respondents; the latter method is based on direct questioning of respondents. Sometimes a mix of data sources, known as **mixed mode**, is used to produce statistics.

In recent years, **Big Data** and **Open Data** have become interesting sources, although their use in official statistics is still limited. Considerable research and development efforts are undertaken in order to develop new and innovative ways to harness these and other emerging data sources for producing official statistics.

Administrative data is produced from information about the population held in administrative registers, e.g., registers on trade operators, businesses, vehicles, population, school enrolment, deaths and births and jobseekers. Such data have been collected for an administrative purpose.

It might often be possible to produce official statistics on the basis of administrative data. The costs of collecting administrative data are covered through the budget of the responsible body. Thus, the costs of further use ('secondary use') for official statistics of these data are normally limited to the additional costs of preparing them for statistical use. In this case, the definition of variables is often different from what is ideally needed for producing statistics, the population covered might be different from the one the statistics aim to measure, and the quality controls are aimed at assuring quality for the original administrative purpose and not for statistical use. However, such issues can be relieved by cooperation between the statistical office and the institutions holding the administrative data. Coordination of the data collection for both administrative and statistical use carry a vast potential for cost reduction and reduction of response burden, while at the same time offering better coverage of the population. In developed countries, where the use of administrative data is more widespread than in partner countries, statistical legislation often grants the statistical office influence on administrative data collections and data.

Examples of administrative records that are used as sources of administrative statistics are reports of schools, monthly compilation of customs statistics, weekly reports by hospitals, daily civil registration of births and deaths (vital statistics) and annual and quarterly surveys of enterprises, based on establishment or business registers. All of these examples are achievable by many partner countries.

Surveys collect data directly from respondents. They can be divided into two main groups:

- **Censuses,** e.g. on population and housing and agriculture, collect data from all population units, for example all persons, all households or all businesses. This method is used when there is a need for exhaustive information

about the population, or when there is only a small number of units in the population (e.g., hydro power plants or steel producers). When the population is large, the costs of carrying out a census are very high; the number and complexity of questions that can be asked must therefore be carefully selected to balance the costs and information value. Censuses are also valuable to give a complete overview over a population, which can be used to draw samples for later surveys ('sampling frame').

- **Sample surveys**, e.g., on household expenditure, enterprises, road freight transport, farm structure, income and living conditions, health and labour force, collect data from a sample that has been selected from the target population to be representative of its characteristics. Various statistical methods are used to derive a representative sample, of which the simplest is random sampling. Other techniques are often based on a sampling frame.

Statistical data is also produced through **estimating**, modelling, short-term forecasting and other methods based on existing data pools. These methods are used to provide, for example, current period statistics when data has been only partially received.

How statistics are collected in any particular country depends on legal and administrative structures. Even within the EU, statistics collection methods vary considerably, especially for social statistics. Statistics collection methods can also depend on development levels. For example, vital statistics (i.e., births and deaths) that in developed countries usually come from the official register are often collected by surveys in partner countries.

The inherent advantage of survey-based data over administrative data is that the survey questions can be tailored specifically to give information about the statistical concept of interest. In contrast, administrative data is defined or categorised by the purpose of the data collection, which is generally unrelated to statistics. Survey questions are also more **readily revised** to capture changing population characteristics, although revisions come at the expense of lack of comparability with historic data.

If there exists administrative information which is sufficiently close to the information collected by survey, one may consider replacing this survey (or part of the survey) by the **administrative** information. Clear advantages are **lower costs** (as the costs are already covered by the administrative body collecting and holding the data) and potentially a much larger number of observations, meaning **greater accuracy**.

Several conditions must be considered when considering whether a survey can be replaced by administrative data, most importantly:

- Whether the administrative concepts are sufficiently close to the desired statistical concept, or whether there is a satisfactory method of converting the administrative concept into the statistical concept;
- Whether the register of units covered by the administrative data is accurate and up to date;
- To which extent the administrative data cover the population covered by the survey;
- Whether appropriate quality controls are in place;
- Whether the long-term availability of the administrative data is assured, or whether the content or the existence of the data is liable to be changed on short notice through administrative or political decisions.

Often, problems in the administrative data concerning incomplete coverage of the statistical population or missing information on certain issues can be addressed through **mixed mode** data collection. This means that the administrative data replace a greater or smaller part of a survey, but that the information which cannot be extracted from the administrative data is still collected by survey. Another important use of administrative data is to benchmark, quality assess and calibrate survey results.

When a survey can be replaced by administrative data, this may be considered as a sign of development of the statistical system and maturity of the administration. However, basing statistics on administrative data requires a good and close cooperation between the statistical office and the administrative body concerned. In this context, a useful tool is to grant the statistical office influence on the set-up and contents of administrative systems and databases through the national Statistical Law. A key issue to consider regarding the quality of information is that respondents trust that data confidentiality is respected by the administrative body; in extension, any statistical use of these data must also assure this confidentiality.

Even though the costs to the statistical office may be substantially reduced, it must still be prepared to pay for the preparation of the data for statistical use and for quality controls and statistical processing. In the end, even the replacement of one single question in a survey may turn out to be a major undertaking.

A good example of the different sources that can be used to produce statistics occurs in vital statistics: data on births and deaths. In developed countries, this information comes from registers of birth and deaths and is usually highly accurate. Some partner countries are also able to maintain these registers to a high standard. Elsewhere, registers might be accurate only in urban areas, may be unreliable or may not exist at all. In these cases, demographic surveys are required to collect the information. If the surveys are intermittent, for example if they are based on the population census and hence occur only every ten years, then problems with respondent recall or survival bias will bring inaccuracies into the data, although methods exist to reduce these problems. In the absence of a register, the best way to collect vital data is therefore relatively frequent surveys of a representative sample of the population, drawn using a sampling frame that is derived from a population census.

In some situations, for example health statistics, statistics from administrative and survey sources exist side by side. They can convey very different information because they are measuring different phenomena: the administrative data will cover events related to government run health facilities, while the sample surveys may cover population health events in part or all of the country. It is possible that neither source provides

full coverage of health-related issues. In this situation, further analysis of both data sources may provide information that is contained in neither data series alone.

The national accounts are compiled from many statistical sources, including the above sources, to measure exhaustively the flows of national income and expenditure within an economy and with the rest of the world.

Core censuses and sample surveys include:

- Population and housing census
- Agricultural census
- Labour Force Survey (LFS)
- Price surveys
- Household Budget Surveys (HBS).

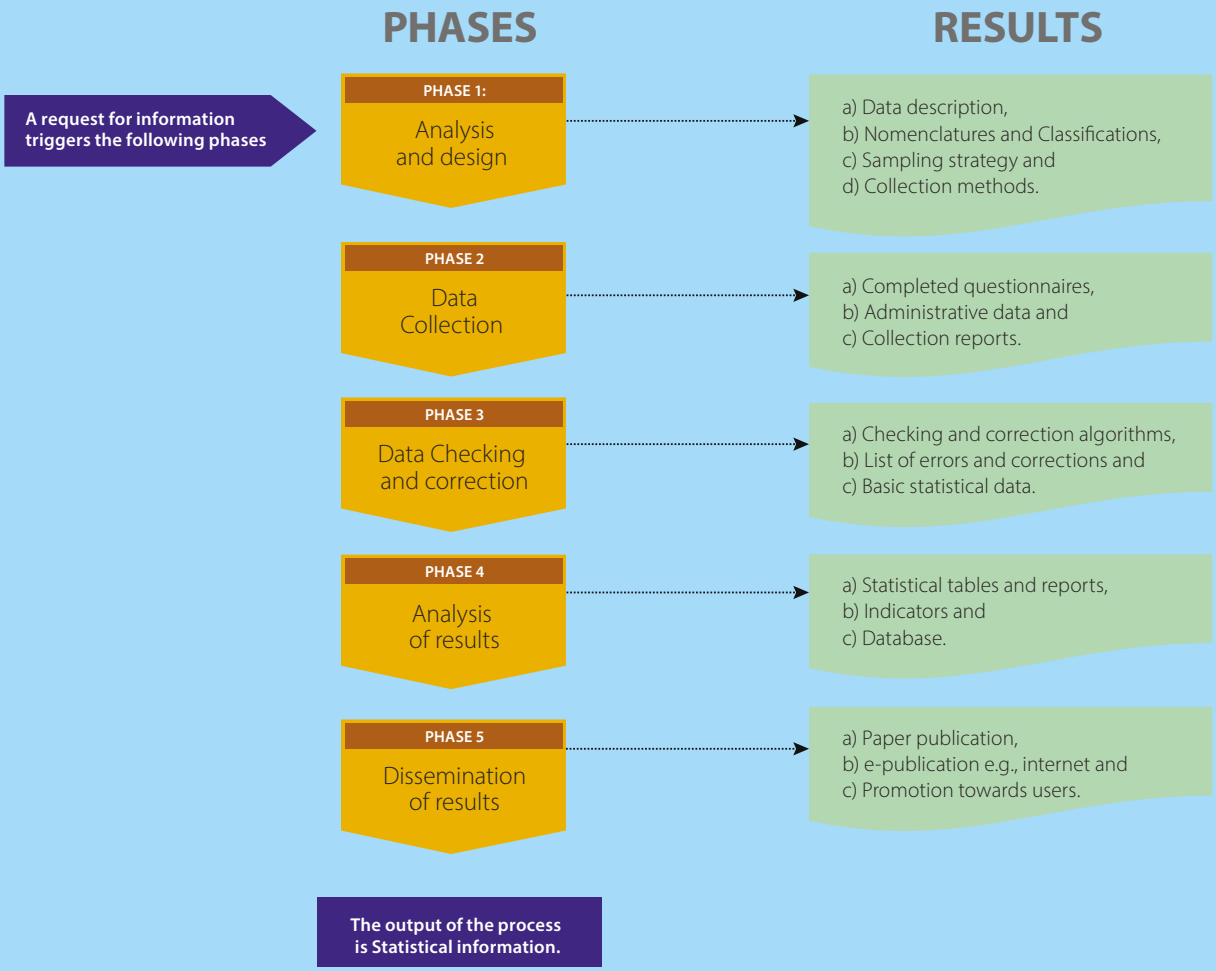
Many partner country household surveys are carried out according to an internationally standardised international format, permitting comparison between partner countries. Some cover more than one policy area, like the:

- Living Standards Measurement Studies (LSMS)
- Demographic and Health Surveys (DHS)
- Multiple Indicator Cluster Surveys (MICS)
- Education Management Information Systems (EMIS).

Box B.2.5 shows a generic picture of the process of producing statistics. This applies to all statistical series, whether based on administrative sources, surveys or both.

The statistical system is set in motion by a request for statistical information to support the preparation, implementation or public oversight of an issue of public concern. A mechanism is required to identify and rank the various demands for data so that official statistics stay relevant to public policy priorities. The output of the system is the dissemination of the resulting statistics.

Box B.2.5: The organisation of the statistical process



To find out more…

- UN Statistics Division: World Population and Housing Census Programme
- UN Statistics Division: The Census KnowledgeBase
- United Nations Population Fund (UNFPA): Census
- World Bank: Living Standards Measurement Study (LSMS)
- USAID: Demographic and Health Surveys (DHS) Program
- UNICEF: Multiple Indicator Cluster Surveys (MICS)
- UNESCO and Global Partnership for Education (GPE): Education Management Information Systems (EMIS) and Efficiency and Effectiveness in Choosing and Using an EMIS. Guidelines for Data Management and Functionality in EMIS (2020)
- OpenEMIS initiative

B.2.2.2 NEW SOURCES OF DATA FOR STATISTICS

For a long time, traditional data sources for the production of official statistics consisted mainly of large operations such as surveys (households surveys, business surveys …) and censuses (population census, economic census …) and of administrative data (tax records for business statistics, schools registers for education statistics …). In the past few decades, the acceleration of digitalisation has led to a growing availability of data [3,4], on all aspects of our societies and of our lives. In particular through the 'internet of things' (IoT)[5], digital data are multiplying exponentially[6] and are becoming more and more attractive for statisticians: they may usefully complement/validate the results they produce using the traditional sources as well as open new areas of investigation. The use of digital data may also provide sufficient and relevant information to extend the period between successive surveys and censuses, thus helping statistical organisations to save money (or to spend more efficiently the scarce resources that they have).

For some sectors, in particular, the measurement of the SDGs, the use of digital sources is the only way to produce the whole range of statistics that will match the freshness and the disaggregation required for a permanent monitoring of progress towards achieving the goals. If they open large opportunities for statistics, digital sources may also generate their own limitations. This is linked in particular to the lack of related metadata (the metadata must be created after the data have been generated) or to the fact that the data are owned by third parties and not by their holders (privacy, security …). Using digital data has vast implications for many aspects of statistical work: data access/use, statistical methodology and the legal framework for statistics, quality, the IT environment, and even management and human resources. This may lead to a complete rethink and reorganisation of the production process for official statistics.

Big Data

Digital data are often referred to as Big Data. Big Data are often described under the three Vs approach[7]: high Volume (amount of data), high Velocity (speed of data in and out, in real time) and high Variety (large range of data types and sources). Statisticians often add a fourth V: Veracity, referring to a sometimes doubtful quality of the available data (inconsistencies), data which are generally loosely structured and often ungoverned. In front of this "data deluge", statisticians have tried to categorise the various sources that they can access and use. In 2013, under the auspices of the UN statistical Commission, UNECE proposed a classification organised on three main blocks: the social networks or human-sources information[8]; the traditional business systems or process-mediated data[9]; and the Internet of Things (IoT) or machine-generated data[10].

In 2015, the UN Statistical Commission established a UN Global Working Group on Big Data for Official Statistics (GWG-BD). Its first task has been to survey statistical organisations to gather information on the big data used for official statistics and the benefits and drawbacks experienced in this area by statisticians all over the world. The main result of the survey has been the identification of promising and less promising big data sources for official statistics and the launch of a series of research and analyses that are bringing the statistical community together under the objective of modernising statistical work and operations. The conclusions of the survey have been somewhat counter-intuitive, as they showed that data from the social media and from mobile phones were less used by statistical organisations than scanner data, satellite imagery and web-scraping[11].

Statisticians have identified several benefits that can be drawn from the use of big data; not only for the production of statistics, but also for building new indicators covering new priority policy areas or feeding nowcasting and forecasting[12]. What is new is the recognition of the respective benefits from "designed data" (data with a pre-specified purpose and use) and "organic data" (from digital sources), even if the latter out-figure the first with their large volumes. There is an emerging consensus among statisticians that the two sources of data must be combined in a multifaceted statistical production process.

3 Cukier, K. and Mayer-Schoenberger, V.: "Datafication: a technological trend turning many aspects of our life into data which is subsequently transferred into information realised as a new form of value", in 'The Rise of Big Data', Foreign Affairs, May/June 2013.
4 O'Neil, C. and Schutt, R. (2013): Doing Data Science, p. 406, O'Reilly Media, 2013.
5 Internet of Things definition
6 The Digital Society
7 Gartner (META group) report : Application Delivery Strategies, blogs.gartner.com, 6 February 2001
8 Social Networks: Facebook, Twitter etc.; blogs and comments; Pictures: Instagram, Flickr etc.; Videos: YouTube etc.; Internet searches; user-generated maps.
9 Data produced by public agencies, medical records, data produced by businesses, commercial transactions, banking/stock records, e-commerce, credit cards.
10 Derived from the phenomenal growth in the number of sensors and machines used to measure and record the events and situations in the physical world. Data from sensors: fixed sensors (home automation, weather/pollution sensors, traffic sensors/webcam, scientific sensors, security/surveillance videos/images) and mobile sensors (tracking - mobile phone location, cars, satellite images); Data from computer systems: logs, web logs. See the Classification of Types of Big Data developed by the UNECE Task Team on Big Data in June 2013 and the Note by the United Nations Statistics Division 'New data sources for official statistics – access, use and new skills', UNECE Conference of European Statisticians (CES), ECE/CES/2019/41, 2019.
11 More than 80 percent of the OECD countries have used or considered using web-scraping data and scanner data. Social media and mobile phone data were at the moment much less used, due to a number of factors, in particular issues related to privacy and confidentiality. (Note by the United Nations Statistics Division 'New data sources for official statistics – access, use and new skills', UNECE Conference of European Statisticians (CES), ECE/CES/2019/41, 2019).
12 Landefeld, S.: 'Uses of Big Data for Official Statistics: Privacy, Incentives, Statistical Challenges, and Other Issues', Discussion Paper presented at the International Conference on Big Data for Official Statistics, Beijing, China, 28 – 30 Oct 2014.

Box B.2.6: Big Data in official statistics

Big Data in official statistics

Using Big Data in official statistics poses several challenges that are, on one side, related to the inherent complexity of this data management paradigm, and, on the other side, related to the official nature of the products provided by NSIs. We envision four major challenges for Big Data usage in Official Statistics, namely:

1. Dimension;
2. Quality;
3. Time dependence;
4. Accessibility.

Among these, Quality and Accessibility seem to be even more critical …"

Source: 'Placing Big Data in official statistics: a big challenge?', presented at Eurostat's NTTS 2013 conference

Social indicators and Big Data

Big Data is one of the most discussed topics in Official Statistics. The potentialities of this new data source are relevant: Big Data can offer new macroeconomic now-casting opportunities for policymakers, providing complementary and faster information on the state of the economy and its development.

In particular, the combination of data from multiple sources can provide a better overview of the economic phenomena. Furthermore, in Official Statistics the integration of Big Data with traditional data sources is a challenging opportunity for the construction of social and economic indicators. Actually, it is unlikely that Big Data will completely replace survey-based activities: they can provide complementary and specific information about a topic or they can help to asses unmeasured or partially measured socioeconomic phenomena.

At international level, the discussion about social indicators and in particular quality of life, well-being and 'Beyond GDP' activities is under constant debate. The measurement of the quality of life and wellbeing from an individual level perspective has become very important with the rise of "Social Indicators Movement" and social media represents a promising data source to study new topics and aspects. Within the European Statistical System, the "Quality of life indicators framework" has been developed to measure the quality of life considering not only the GDP, but also other complementary and subjective aspects. However, it is a static measure and the opportunities deriving from Big Data and, in particular from social media analysis is that we obtain dynamic indicators that show the changes over time and the reaction of people to particular events.

On the other hand, new issues are rising. For example, social Big Data indicators "usually do not correspond to any sampling scheme and they are often representative of particular segments of the population".

Source: 'Social indicators and Big Data: a case study on social indicators and active citizenship', poster presentation at Eurostat's NTTS 2019 conference (p. 12);

Under the generic term of Big Data, some specific sources and practices may be highlighted for their promising use by official statistics.

Satellite data

Over the last few decades, the volume and quality of geospatial observations has increased dramatically: technical progress and the multiplication of satellites is leading to a flow of images generated from multiple sensors and with different resolutions, thus opening huge opportunities for study and analysis. In 2017, the GWG-BD presented to the UN statistical Commission a handbook[13] to guide National Statistical Offices considering the use of satellite imagery/data (satellite Earth observations) for official statistics. Earth observation allows studying the Earth from space; its land surface, the oceans and the atmosphere. Through specific algorithms (empirical, semi-empirical, semi-analytical inversion, object-based image analysis, artificial intelligence and machine-learning methods), these observations can be translated into spatial, spectral, and temporal information, which can then be related to indicators.

The implications for statistical work are very promising, particularly for the creation and updating of registers, sampling, data confrontation and the enhancement of the measurement of economic, social, and environmental phenomena.

Box B.2.7: Using satellite data to monitor development in Africa: The Africa Regional Data Cube (ARDC)

The Africa Regional Data Cube (ARDC) is a tool that harnesses the latest Earth observation data and satellite technology to help Ghana, Kenya, Sierra Leone, Senegal, and Tanzania address various issues relating to agriculture, food security, deforestation, urbanization, water access, and more.

Source: Global Partnership for Sustainable Development Data: Africa Regional Data Cube

13 United Nations Task Team on Satellite Imagery and Geo-spatial Data: Earth Observations for Official Statistics – Satellite Imagery and Geospatial Data Task Team report (2017)

Scanner data

The introduction of barcode scanner technology during the 1970s and its growth in the 20th and 21st centuries has enabled retailers to capture detailed information on transactions at the points of sale. Scanner data[14] are high in volume and contain information about individual transactions or summaries, dates, quantities and values of products sold, and product descriptions. As such, they are a rich data source for NSOs and are more and more frequently used for calculation of consumer price indices (CPI). Scanner data are gathered either directly by the NSOs through agreements with retailers or indirectly from intermediaries or market research companies.

Box B.2.8: Eurostat: Practical guide for processing supermarket scanner data

Scanner data have several advantages over traditional price collection:

- They provide information on the actual expenditure for all item codes sold (by the retailer whose data is used);
- They provide price information on actual transactions over longer periods of time rather than on just one day per month;
- They exclude items not actually sold and include certain types of discounts;
- They are a better source of information for the inclusion of new items in the HICP than reliance on price collectors;
- They can reduce the administrative burden on retailers and save costs on price collection.

Using scanner data holds the promise of improving the quality of the HICP.

Source: Eurostat's 'Practical guide for processing supermarket scanner data' (2017)

Citizen-generated data

"Citizen-generated data (CGD) are data that people or their organisations produce to directly monitor, demand or drive change on issues that affect them"[15]). CGD are a useful complement to institutional data, as they can highlight issues that are important to people and feed their views into a higher level of policy debates. They can also be used to verify official narratives and datasets. The initiatives that create CGD can also empower people, giving them a way to engage with political processes that might otherwise seem removed from their lives. However, one of the drawbacks of using CGD is that citizens may actively contribute data, but generally only if this may bring a benefit to them. This is one of the reasons why, together with potentially substantial costs, CGD are not much used by statistical organisation despite promising potential benefits.

Box B.2.9: PARIS21: Why are citizen-generated data useful for NSOs?

Countries need data at an unprecedented level of granularity to respond to crisis and its effects, and to monitor their national, regional and global agendas, ensuring that no one is left behind. Citizen-generated data (CGD) have the potential not only to fill some of those data gaps, but their use by NSOs can facilitate engagement with data users and enhance trust in data.

- **Close data gaps:** CGD might enable policymakers to track sensitive issues at the communal level for which official statistics are often unavailable, for example CGD on violence against women. Furthermore, Sustainable Development Goals (SDG) indicators on areas such as reproductive health, disability or environmental issues, often uncovered by official statistics, might also benefit from CGD.
- Strengthen engagement with data users: Within the data ecosystem, CGD producers are also data users. Hence, the collaboration between NSOs and CGD producers is an opportunity for NSOs to reach out to their data users, strengthen their relationship with them and better understand their needs.
- Enhance trust in data: Collaboration between NSOs and CGD producers can help to enhance institutional trust. Enabling a space of dialogue and cooperation with non-conventional data producers is an opportunity for NSOs to communicate the integrity, transparency, impartiality and confidentiality of their practices.

Source: PARIS21: Citizen-generated data

Web scraping

Web-scraping (also called web harvesting or web data extraction) is a process by which information is collected/extracted and copied from the Internet for analysis. It can be done manually or using automated methods (a web crawler for example). Today, many NSOs are gathering information from the Web as a component of applications used for web indexing and data mining. These applications may cover traditional statistics such as price monitoring or comparison, or weather data monitoring; they may also open new areas of research through for example tracking online presence and reputation.

14 UN Committee of Experts on Big Data and Data Science for Official Statistics: Task Team on Scanner Data.
15 CIVICUS: What is citizen-generated data and what is the Datashift doing to promote it? (brochure).

Box B.2.10: Web-scraping – Canada and Germany

Statistics Canada's Code of Ethics for Web-Scraping (extract)

In this information era, it is more important than ever to provide Canadians with reliable and timely data in order to enable informed decision-making.

Statistics Canada is using web scraping to gather data efficiently. Web scraping is a process by which information is collected and copied from the Internet for analysis. It can be done manually or using automated methods.

The use of web scraping is part of a broader effort to reduce burden on businesses and organizations while continuing to provide high-quality, timely data in a cost-effective manner.

In the spirit of openness and transparency, Statistics Canada is committed to respecting the following best practices when conducting web scraping.

Statistics Canada will:

- Transparency
  - carry out web scraping activities in a transparent, consistent and ethical manner;
  - notify the relevant companies that web scraping activities will be taking place;
  - publish the results of the web scraping activities on its website;
  - conduct all web scraping activities on Statistics Canada authorized computer equipment connected to its highly secure networks and secure the data on encrypted servers.
- Ethics
  - use web scraped data appropriately and responsibly in statistical programs in order to facilitate fulfilment of its mandate;
  - collect only data available to the public from businesses and organizations for use in its statistical and research programs;
  - take steps to minimize burden on the websites, such as scraping during off-peak hours and only as needed, and coordinating data requirements across statistical programs to avoid duplicating efforts;
  - use an application programming interface (API) when possible in lieu of web scraping;
  - limit collection to only what is necessary and proportional for the production of the required statistical outputs.

Statistics Canada will not:

- scrape personal information about individuals from acrape personal information that could establish a profile of individuals;
- resell web scraped data or use them for commercial purposes;
- scrape any information that will not be used to produce statistical outputs.

Source: Statistics Canada's Code of Ethics for web-scraping

German system for web-scraping of price data and the issue of dynamic pricing

Dynamic pricing is the use of automatic algorithms to change prices at short notice due to changes in market conditions or due to parameters indicating a consumer's willingness to pay. The application of a dynamic pricing pattern is not new but has become more obvious since the growing importance of internet purchases and has additionally become popular for online retailers in order to attract customers or to increase profits. Dynamic pricing must be distinguished from the phenomenon of individualised pricing which is defined as the use of automatic algorithms to change prices due to characteristics of an individual consumer, such as the device used for purchase, the location of purchase, browser history or simply gender-related characteristics. While algorithms of dynamic pricing treat all consumers equally, individual pricing only affects consumers with pre-defined characteristics.

More and more information is freely available on the internet. Some of this information may be used for the production or validation of statistics. Web scraping has become an acknowledged technique for online data collection. Many national statistical institutes make use of web scraping for their production. One of the great advantages of using web scraping is, once a program is successfully launched, nearly infinite data collections at web shops or other web pages are possible to initiate. Web scraping therefore supports increasing the quality of statistics by simply having more data available. One of the disadvantages of web scraping is that, in the beginning, a considerable amount of effort is setting up a web scraping program which requires in-depth programming skills in appropriate languages, such as Java, Python or R. The application of web scraping for all online data collections is therefore staff-related.

Dynamic pricing of online retailers may lead to a bias in the index calculation since the traditional way of price collection via internet is done generally at one time during the month and therefore cannot capture rapidly changing prices. Therefore, in order to display reliable price developments in indices, consumer price statistics need to constantly monitor the pricing behaviour on the internet and apply methods to evaluate the large amount of data and integrate very volatile price developments into price indices.

Source: 'Web scraping for beginners - Simple automation of online data collections', presented at Eurostat's NTTS 2021 conference

Open data

"Open data is data that can be freely used, re-used and redistributed by anyone - subject only, at most, to the requirement to attribute and share alike." [16] Open Data are distinct from Big Data, but some valuable Open Data are also Big Data, such as weather and satellite data, geospatial data, and some kinds of data on health, finance, energy and the environment. The distinguishing feature of Open Data is not their size or complexity, but the fact that they are made available as a public good[17]. In general, much of the most important Open Data come from public sources. In recent years, many countries have signed commitments to open data and open government practices. Despite these commitments, many governments have not fully realized the potential of providing open access to the full range of data produced and maintained by their national statistical systems.

Box B.2.11: Open data barometer

Good quality open data need to be:

- **Available online** so as to reach the widest practical range of users and uses.
- **Machine-readable** so that large datasets can be analysed efficiently. More and more data are becoming available in a reusable format but almost half of the data available are still published in non-machine-readable formats.
- **Available in bulk** so that they can be downloaded as one dataset and easily analysed by a machine.
- **Free of charge** so that anyone can access them no matter their budget. Particularly worrying is the case of land ownership data, only free of charge for about one-third of the data available.
- **Open-licensed** so that anyone has permission to use and reuse the data. Most data are currently not available under open licences.

Source: Open Data Barometer (4th Edition) — Global Report (2017)

Box B.2.12: Open Data Watch: Open Data Inventory

The Open Data Inventory is designed to evaluate the coverage and openness of data published on NSO websites*. While some countries have more than 100 offices and agencies that produce official government statistics, we only consider data that can be found on the NSO website or for which the NSO website provides a direct link. Currently, the most accessible data for many countries are available only on the websites and in the databanks of international organisations. This should not be the case. Governments and their statistical offices are the source of much of the data that appear in international databases and should provide open and timely access to these data.

Source: Open Data Watch: Open Data Inventory

(*) Open Data Watch: List of National Statistical Offices Online

16 Open Data Foundation: Opewa Handbook

17 Petrov, O., Gurin, J. and Manley, L.: Open Data for Sustainable Development, World Bank Group, Connections briefs on Transport & ICT, 2016.

Towards Smart and Trusted data

Recent reflections on the use of Big Data for Official Statistics have evidenced two main aspects. On one hand, some of the new data sources offer enormous potential (in terms of timeliness, coverage, detail and insightfulness) but, on the other hand, such big opportunity comes along with major challenges in almost any implementation aspect (methodological, technical, organisational and legal).

But the data revolution, generated by the rapid evolution of our "datified world", is not only about more available data. It is also about changes in the demand for information and the way this information is consumed and circulated: it is linked to changes in perceptions, expectations, behaviours, and relations between people. "The traditional model of pulling data in – from data sources to NSIs – will not fit in the new scenario. Instead, we envision a model based on pushing computation out – from NSIs to the data acquisition systems. This shift of focus from sources to systems lies at the core of what we call Smart Statistics"[18] . This new environment may impact considerably on the future organisation of the statistical work.

Public-Private Partnerships (PPP) for statistics[19]

As illustrated in the sections above, recent years have seen a growing literature and reflection about the potential applications of big data in official statistics and policy. The lessons drawn so far is that a combination of "designed data" with "organic data" is part of the ticket to the future of statistics. However, these exponentially increasing amounts of valuable and frequent data are mostly held by the private sector. The NSOs must more and more frequently negotiate PPPs in order to have access to data that can greatly help the statistical production. There are advantages in mobilising big data such as cost-effectiveness (the cost of transfer of existing data is marginal), timeliness (real time availability), granularity (in time, space and theme) and potentiality for new indicators. However, drawbacks also exist in the form of secrecy linked to competitive risk, issue of privacy and ethics (data sharing), legal constraints (no clear mandate for NSOs to deal with micro-data), incentives and sustainability (different time perspective for benefits) and technical challenges (processing of decentralised, unstandardised, unstructured and unrepresentative data). All these elements must be considered for assessing the extent of a mutually beneficial PPP[20].

18 Eurostat: Trusted Smart Statistics: A reflection on the future of (Official) Statistics, presentation at the Q2018 European Conference on Quality in Official Statistics, Krakow, Poland, 2018, and Eurostat: Trusted smart statistics: Motivations and principles, Statistical Journal of the IAOS 35, pp. 589–603, 2019.

19 Robin, N., Klein, T. and Jütting, J.: Public-Private Partnerships for Statistics: Lessons Learned, Future Steps: A focus on the use of non-official data sources for national statistics and public policy, OECD Development Cooperation Working Papers, No. 27, OECD Publishing, Paris, 2016.

20 Robin, N., Klein, T. and Jütting, J.: Public-Private Partnerships for Statistics: Lessons Learned, Future Steps: A focus on the use of non-official data sources for national statistics and public policy, OECD Development Cooperation Working Papers, No. 27, OECD Publishing, Paris, 2016.

Box B.2.13: Some drawbacks of Public-Private Partnerships (PPP)

Public Private Partnerships (PPPs) harness both the public and the private sector to provide goods and services conventionally supplied by the public sector, while easing the tight budget constraints on public spending. We found that despite PPPs have the potential to achieve faster policy implementation and ensure good maintenance standards, the audited projects were **not always effectively managed and did not provide adequate value for money**. This was also due to the **lack of adequate analyses, strategic approaches towards the use of PPPs and institutional and legal frameworks**. With only few Member States having consolidated experience and expertise in implementing successful PPP projects, there is a high risk that PPPs will not contribute to the expected extent to the aim to implement greater part of EU funds through blended projects including PPPs.

Source: European Court of Auditors: 'Public Private Partnerships in the EU: Widespread shortcomings and limited benefits', Special report 09/2018

B.2.2.3. PUBLICATION, DISSEMINATION, COMMUNICATION AND VISIBILITY OF STATISTICS

Statistics, and in turn the resources that are allocated for their production, are only legitimate if they are used, if they serve to answer/fulfil needs from users. This legitimacy builds on several components that all converge to quality statistics, but that also concur to the visibility of statistics. These components, all originating from the Fundamental Principles of Official Statistics, translate into the following concepts:

- relevance (the data fulfil the users' needs),
- completeness (all needed statistics are available),
- timeliness (statistics are produced and released according to a clear and available calendar),
- accuracy (reflecting the closeness of the measurement to the reality that they measure),
- accessibility (statistics are easily consulted and acquired by all users),
- clarity (statistics are accompanied by adequate meta-data),
- transparency (statistics are available in a comprehensible, accessible, and timely manner),
- comparability (compliance with international norms and standards), and
- coherence (statistics are logically coherent and reliable).

They all have concrete and practical translations in the day-to-day statistical work. They are crucial for all statistical activities and operations, including those that concur to disseminating and communicating statistical products; they are key for building trust and confidence with the users and thus for contributing to the visibility of official statistics in today's world of information.

Publication

The overall purpose of official statistics is to serve the information system of democracies, feeding well-informed debates, contributing to evidence-based decision making and measuring progress and performance of policies and programmes. The First Principle of the UN Fundamental Principles of Official Statistics clearly states the responsibility of statistical organisations for releasing information to the public. This is the professional responsibility of statisticians to make the statistics that they produce available to the entire public. In the past, this responsibility was not entirely integrated into usual statistical practices. Today, releasing the data produced is systematic. This has generated new expectations from the users of official statistics and new behaviours from the producers.

Box B.2.14: Fundamental Principles for Official statistics – Relevance, Impartiality and Equal Access

Principle 1: Relevance, Impartiality and Equal Access Official statistics provide an indispensable element in the information system of a democratic society, serving the Government, the economy and the public with data about the economic, demographic, social and environmental situation. To this end, official statistics that meet the test of practical utility are to be compiled and made available on an impartial basis by official statistical agencies to honour citizens' entitlement to public information.

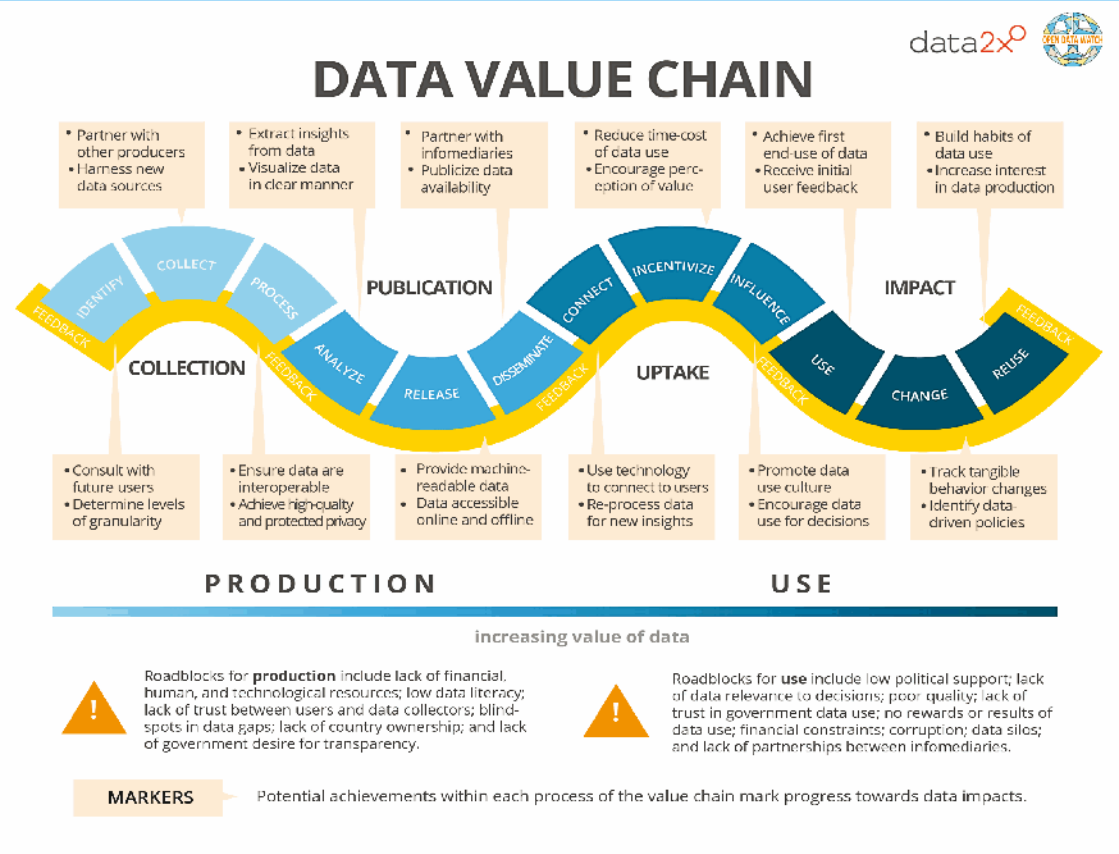
Source: United Nations Fundamental Principles for Official statistics: Principle 1 - Relevance, Impartiality and Equal Access

Publication is also a key step in the data value chain. The data value chain approach considers the whole eco-system of statistics and its potential for generating value by linking all steps from the gathering of data sources to the final use and analysis of the data. Four successive steps are usually considered in the chain: **collection** (identify, collect and process); **publication** (analyse, release, disseminate); **uptake** (connect, incentivise, influence); and **impact** (use, change, re-use). All these steps involve both data producers and data users. Good coordination within the whole eco-system is thus essential.

Box B.2.15: The data value chain

The second stage on the value chain is publication. Once data have been collected, the data and the accompanying metadata must be published in such a way that data users can access them. The publication stage involves three activities: publishing data with appropriate documentation in online and offline formats; disseminating the data to prospective users; and analysing data to extract useful information.

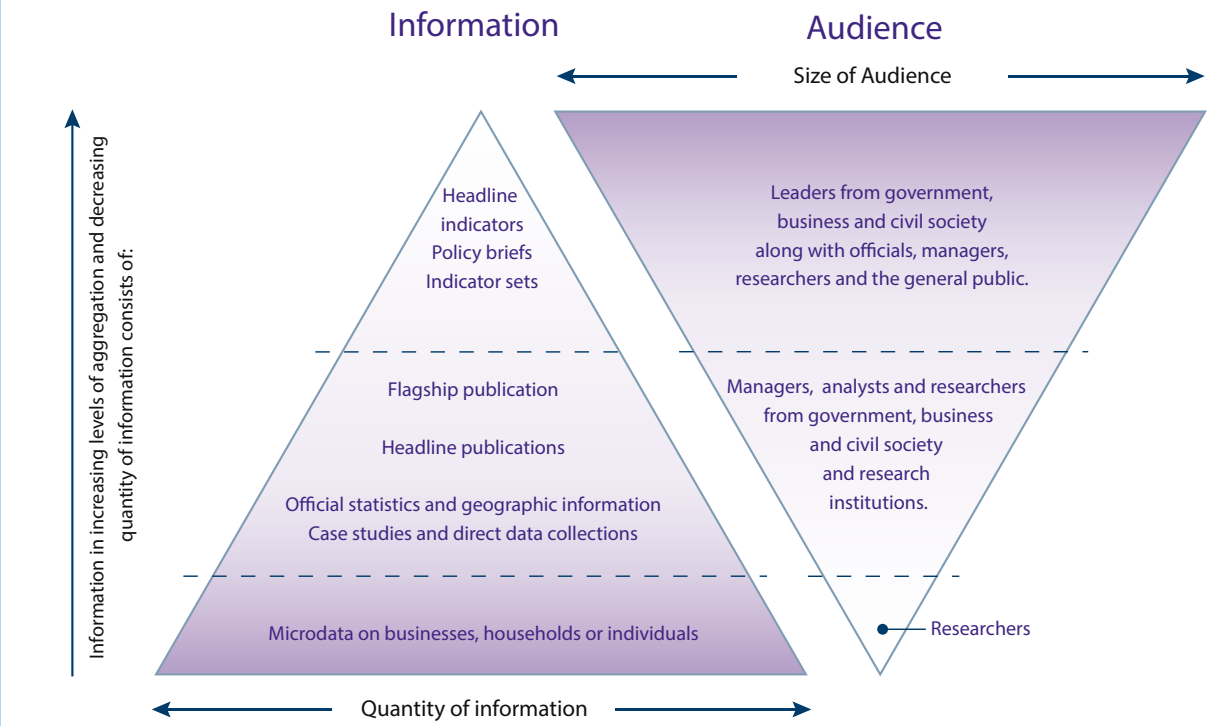
Source: Open Data Watch: The Data Value Chain – Moving from Production to Impact



Dissemination

Data dissemination is a phase in the statistical processes, in which the data collected and compiled by statistical organisations are released to the public. The dissemination process is the result of an analysis of who the users are and what their respective needs are. This allows giving each of them the products that are the most adequate in terms of content (theme and topic, disaggregation as well as level of analysis and format) and in terms of channels/medias of dissemination (from paper to social media). In general, decision-makers are interested in macro and headline indicators that are provided online or through reports and short leaflets, while researchers will look for more detailed and micro statistics accessible online. The general public focuses on the data that make the news and on short, concise and attractive messages.

Box B.2.16: UNECA: Audience and Information



Information and audience model for the ECA data and related information and knowledge products.

Source: UNECA

Dissemination should follow a certain number of rules that have been already discussed above, derived from the Fundamental principles for official statistics. It is crucial for statistics organisations to define and respect a release calendar for the dissemination of their products. It is important for the users to know what will be released and when in order to plan their own work and analyses. It also guarantees that all users are treated equally and have an equal access to data. The simultaneity of the release must build on the timeliness and clarity of the products and if there are changes in the calendar and/or in the content, this must be notified clearly and in advance. What applies to the data must also apply to the accompanying metadata. In order to generate trust and confidence in official statistics, the products must also be objective and non-partisan, building on the professionalism and independence of the statisticians, which are core aspects of their credibility. The respect of confidentiality and the attention to security issues are also to be considered seriously. These rules are major safeguarding references for the statisticians and must dictate the way they relate with their users when releasing their products.

Box B.2.17: Eurostat: Dissemination policy

Eurostat's dissemination policy is characterised by free access to European statistics for all users. This policy respects a number of principles, such as objectivity, impartiality, confidentiality, and accessibility, which are laid down in Regulation (EC) N° 223/2009 on European statistics and in the European Statistics Code of Practice.

Eurostat provides its data free of charge via the Eurostat website as well as a wide range of products and services, including assistance to all types of users: newcomers, sporadic visitors or more experienced users.

Source: Eurostat: Communication and dissemination

Making statistical data more attractive to the users has been on the agenda of all the national statistical offices for some years now. Everybody realises that an investment must be made on the presentation and attractiveness of the data, in particular to better match the requirements from the new age in communication and from the acceleration of and change in the consumption of information, including statistics. However, giving more emphasis on the presentation of the data may reveal to be challenging in a statistical environment where the priority has always been put on production. Changing mentalities and practices within the statistical community is a long shot task and it may also be costly in terms of technological development and human capacity building.

Dissemination products

Statistical products are, generally, information dissemination products that are published or otherwise made available for public use. They include general-purpose tabulations, analyses, projections, forecasts, or other statistical reports[21]. They may consist of yearly, quarterly or half-yearly statistical reports, sector publications and reports, press releases, infographics and video-graphics, animated products, maps or databases[22].

Box B.2.18: Department of statistics – Singapore

"As the National Statistical Office, we deliver insightful statistics and trusted statistical services that empower decision making. Our data are used by public sector agencies, policymakers, international agencies, businesses, researchers, analysts and the general public as vital inputs for monitoring economic and social trends, policy formulation and evaluation, planning and research, and international reporting.

Statistical information, analyses and visualisations are communicated and disseminated through user-friendly platforms such as our website, mobile and electronic services."

Source: Department of Statistics Singapore: Visualising Data

Data visualisation products[23] are more and more developed by statistical organisations as they have several advantages over other products. They are more attractive than standard tables and graphic presentations of the data and they are thus well suited for the dissemination through social media and for targeting younger audiences. Their production requires an additional reflection/investment as to prioritize among messages or indicators; as a consequence, they generally allow better targeting of the audience. Their elaboration requires a multidisciplinary look and perspective that must bring together statisticians (for the data), communication officers (for the message), designers (for the content organisation and drawing) and IT specialists (for the visualisation tools): it is a cooperative teamwork that may also strengthen the internal organisation of the institution and lead to a revamping of the dissemination strategy[24]

Box B.2.19: UNECE "Making Data Meaningful — Part 2: A guide to presenting statistics"

"Emerging tools and techniques are providing new opportunities for visualizing data and making them more interesting to users. Dynamic table, chart and map generators allow users to manipulate data and create their own visualizations. Animation and video are engaging formats, somewhat like television. They do a good job of illustrating changes over time and include verbal or textual descriptions to explain the meaning behind the numbers."

Source: United Nations Economic Commission for Europe (UNECE): Making Data Meaningful — Part 2: A guide to presenting statistics

Box B.2.20: Data visualisation example – Canada

Statistics Canada - Behind every number: A portrait of Canada (online video, 2017): Behind every number: A portrait of Canada

Data portals are instruments that make large sets of data available to the users, from different sources and covering different topics, with a single point of entry. They can build on data only, but most often they also offer applications for constructing tables and graphs or for carrying out data analysis. Normally, they also provide references on methods and norms. They are generally used for presenting the results of large statistical operations (surveys and censuses), but not only that. They may be open to all or accessible only with a password. However, with the rapid spread of the Open Data approach, the use of password-restricted access is quickly disappearing. The measurement of the SDGs and its implication in terms of data sources is bringing new considerations[25] to the content, format and access for data portals.

Box B.2.21: Examples of country data portals – Oman and Uganda

Oman

The Data Portal of the National Centre for Statistics and Information is a free and data-sharing portal. Anyone can access data relating to the Sultanate of Oman. The Data Portal provides many datasets from different entities, for everyone - citizen, investor, researcher or developer.

Source: National Centre for Statistics and Information, Sultanate of Oman: Data Portal

Uganda

The CountryStat data portal in Uganda includes datasets from the following domains: Production, Food availability, Trade, Machinery, Population, Prices, Value added, Land use, Employment, Water, Livestock, National account, Fishery and Forestry. CountrySTAT allows for the analysis of data coming from different sources to be manipulated and visualized directly online. Various types of charts are available to allow users to be able to perform further analysis. CountrySTAT supports online data filtering. Users can skim through complex data sets and easily locate the desired information. Subnational data can be visualized through maps to allow a clear and immediate view of statistics at lower administrative levels.

Source: Uganda Bureau of Statistics (UBOS): Data Portals

21 ESS Vision 2020 ADMIN (Administrative data sources) project: Definition of 'Statistical product'.

22 United Nations Economic Commission for Europe (UNECE): Making Data Meaningful — Part 2: A guide to presenting statistics, Geneva, Switzerland, 2009.

23 Data visualisation products can be non-animated and/or animated, with or without visual effects, present data only or data and text.

24 Office for National Statistics (United Kingdom): Presenting data — Guidance for creating charts and tables and best practice for using colour in your work.

25 Greenwell, G., Kinyua, J., Klein, T. and Ranjan, R.: Making Data Portals work for SDGs: A view on deployment, design and technology, PARIS21 Discussion Paper No. 8, 2016.

Channels for dissemination

The number and variety of channels for dissemination of statistics have increased dramatically in the last 20 years or so. Initially, dissemination was mainly made using paper publications (yearbooks, newsletters, press releases …). The costs[26]) were high, and as a consequence much data remained in the drawers of statistical organisations. In the 1990s, CD-ROMs were extensively used to market and circulate large data sets. The cost remained high. Later, web-based and online dissemination has developed considerably as a result of progress in IT tools for data archiving, storage and access, but also of increased access and use of the internet around the world. Data portals make the results of large statistical operations (surveys and censuses) available and facilitate the users' access to the data. The cost of dissemination has decreased. However, such tools are not adequate for all users. More recently, social media (Twitter, Facebook, LinkedIn, Instagram, YouTube …) as well as the development of mobile apps have opened new opportunities to access and target different categories of users. Today, most statistical organisations communicate with their users through posting key messages and results on social media (in addition to the more 'traditional' ways of dissemination through online datasets, online analytic articles, and downloadable reports). This evolution may prove to remain costly, as the statistical products have to be multiplied (an effective presence on social media requires posting regular information) and their attractiveness depends mostly on data visualisation. This technique is not fully mastered by many statistical organisations. It also requires investments in terms of IT tools (motion design, video …) and specialised human resources (designers and communicators, in particular).

Box B.2.22: Statistical Yearbook replaced by digital communication – Germany

The German Statistical Yearbook was hit by the transition to digital visualisation of data. The last edition boded its farewell at a press conference on 30 October 2019:

"Digitisation is shaping the statistics of the 21st century. The expansion of our digital communication is necessary if we want to remain the leading provider of statistical information about Germany. We say goodbye to the Statistical Yearbook, which stood for our activities for almost seven decades. The yearbook goes, but the data remain. They are already available via our online services in greater abundance than ever before… One thing is clear: Rigid reference books are hardly in demand today. The trend is towards up-to-date, digitally available information. The information is researched online."

Source: Destatis press conference, Wiesbaden, Germany, 30.10.2019 (in German)

Box B.2.23: We are Statistics Canada – YouTube channel

Statistics Canada presents data through its own channel on YouTube, featuring videos containing background information, instructions and support for the Census 2021, main figures on Canada, explanations of key terms such as GDP and Consumer Price Index etc.: Statistics Canada YouTube channel

Relations with the users and users' needs

What exactly do these statistical data mean? How far can I trust them? Using Using statistics often implies asking these kinds of questions. The work of a statistician is based on conventions that may result in complex concepts, methods, tools, and processes. As a consequence, this work is largely unknown or not well understood by statistical novices or non-statisticians (which most users are). Producers and users of statistics speak different languages, but they need to talk to understand each other and collaborate better for the benefit of all.

Users are not homogeneous. They cover very different groups who have different ways of consuming statistical information. They may be institutional users or not; they may be very heavy, heavy, light, occasional or potential consumers of statistical information; they may have a general interest, be interested in a very specific subject or be involved in research[27]. In the relations with them, one size (one mode, one format) does **not** fit all.

It is highly recommended to split the users into segments, in order to relate more efficiently with each group of users and work in closer proximity (organise visits, make invitations, set up focus groups, arrange in-depth interviews). This will also allow better targeting of the services and products offered by the statistical office. In the past, statistical offices often applied one-way avenues of communication with the users (pulling out), asking for their feed-back on the available products through satisfaction surveys or posts on dedicated sections of their websites. More recently, the segmentation of users has allowed the statistical offices to enter into in-depth exchanges with specific groups of users (pushing in). It is only recently that, instead of only relating with the users, many statistical offices have gone a step further by engaging with the users. The new approach establishes a two-way avenue between users and producers of statistics, through which the two groups may collaborate more closely: The users are more involved in the design of the statistical products that they will later use; in turn, the producers become more aware of the users' needs and may help them to better understand how the statistics may be used.

26 And not only on monetary terms. The dissemination of paper publications required a strong organisation and management in order to make sure that the documents were reaching the right targets. In addition, this type of products was not suited for mass dissemination.

27 European Statistical Advisory Committee (ESAC): The Users of Statistics and their role in the European Society (2015)

Box B.2.24: Why do we need to engage with users?

We need to engage with users so that we:

- prioritise our work based on what statistics users want;
- understand what users do with our data;
- understand what is an acceptable level of quality;
- present statistics when they want them and in a way they understand;
- can build trust in our statistics;
- maximise the use of our statistics;
- can test experimental statistics;
- can make users feel a part of the process.

Furthermore, the Code of Practice for Statistics says:

"Users of statistics and data should be at the centre of statistical production; their needs should be understood, their views sought and acted upon, and their use of statistics supported."

Source: Government Statistical Service (United Kingdom): Why we need to engage with users (2019)

Box B.2.25: Measuring data use

If the first rule of communication is "know your audience," then web analytics should form the foundation for NSOs' digital dissemination strategies. The analytic tracks left by website users provide evidence of what users are looking for and what they found. To better anticipate what users need, NSOs should consider using feedback forms, user surveys, focus groups, and advisory councils complemented by web traffic data. Changes made in response to user demands should always be reflected in the data. An effective web analytics and optimization program creates a robust feedback loop that connects data providers, content creators, website managers, and IT staff back to their users. This study reaffirms our belief that NSOs should view web analytics as a vital resource available to them to help disseminate data effectively.

The study also confirmed that NSO websites and data portals themselves are important vehicles for data dissemination.

Source: Open Data Watch: Measuring data use – an analysis of data portal web traffic (2018)

There is one category of users who may be an efficient relay for disseminating statistics and improving the trust that other users have in statistical organisations: journalists[28]. Establishing better relations with the media is a common goal for the statistical offices, not only to ensure a better interpretation of the data but also to establish networks for regular and efficient exchanges, thus reaching other audiences more effectively. Each profession, statisticians on the one hand and journalists on the other, must stay within their respective roles. However, both must contribute to building a profitable and mutual understanding on key statistical issues: how statistics are produced and how they can be best used in the public debate. An objective and professional analysis of official statistics by journalists, sensitized to the intrinsic constraints and qualities of the statistical production, may bring a new light for other users on what statistics can bring to the public debate. This may in turn have an impact on the level of trust and confidence in the statistical office.

28 United Nations Economic Commission for Europe (UNECE): Making Data Meaningful — Part 3: A guide to communicating with the media, Geneva, Switzerland, 2011.

Box B.2.26: Communication for statistics (C4S): a training course developed under MEDSTAT IV

In 2018-19, MEDSTAT IV* developed the C4S (Communication for statistics) training course together with the statistical offices of the EU's Southern Neighbourhood partner countries. The course resulted in the implementation of national training sessions in eight our of nine participating countries. These courses were very diverse in their format and content, but all converged to improving the relation between journalists and the statistical institutions. The C4S course has been continued under the fifth iteration of MEDSTAT programme.

Source: 'The C4S training for trainers course from the MEDSTAT IV project: description and initial lessons', presented at the 16th Conference of IAOS (2018)

(*) MEDSTAT IV was an EU-funded programme to support the improvement of statistics in the countries of the EU's Southern Neighbourhood. It covered several topics, including visibility, under which the C4S training course was prepared and implemented. The C4S component has been continued under the succeeding phase of MEDSTAT programme (MEDSTAT V).

Visibility of statistics

In our world of communication and information, official statistics are becoming less visible than before. On the social media in particular, they are in daily competition with huge flows of information, among which the consumer does not always make a distinction between what is of quality and what is not, what is the result of professional and objective work and what is not. The risk of 'fake news' is permanent and unchecked, and partisan information constitutes the bulk of the day-to-day news. For statistics, this translates into misleading or simply incorrect interpretations/presentations of the data. Official statistics are not particularly well armed against the expanding number of competitors in this new and rapidly changing environment: the freshness of the data is difficult to reach (particularly for macro aggregates), statistical organisations do not entirely master new communication and dissemination tools, users of statistics are often difficult to satisfy, and resources needed to do better are scarce or lacking[29]. The defence of official data against subjective interpretations is not always organised and "rectifications" may come too late or through inaudible channels. There is a risk for official statistics to be greatly affected by this new information era. It is crucial to build a strong relation with the users through promoting the use of statistics and by increasing statistical literacy.

29 Baldacci, E. and Pelagalli, F.: Communication of statistics in post-truth society: the good, the bad and the ugly, Eurostat Statistical Working Papers (2017).

Box B.2.27: Promotion of the use of statistics – Finland

The scope of promotion of the use of statistics extends to improvement of the usability of statistical information and the product and service selection based on it, and widening of public knowledge about them, as well as elevation of skills in statistical literacy and in the use of statistics.

The aim in promoting the use of statistics is to ensure wide and efficient exploitation of statistics in society. To attain this, statistics must be easily available and usable. The availability of statistics is improved by general and product-specific or statistics-specific communication and marketing and by making products and services easy to find and access. The usability of statistics is enhanced by making statistical products and services clear, illustrative, and suitable for user needs. The use of statistics is also fostered by the provision of guidance and training in their use and reading.

There is common understanding among statisticians that the visibility of their work must be improved as to be in a position to fight and survive.

Even when data is available and accessible, it may not be visible enough to prospective users for them to take advantage of this information in their work.

Source: Statistics Finland: Quality Guidelines for Official Statistics, 2nd Revised Edition (2007)

Communication strategy

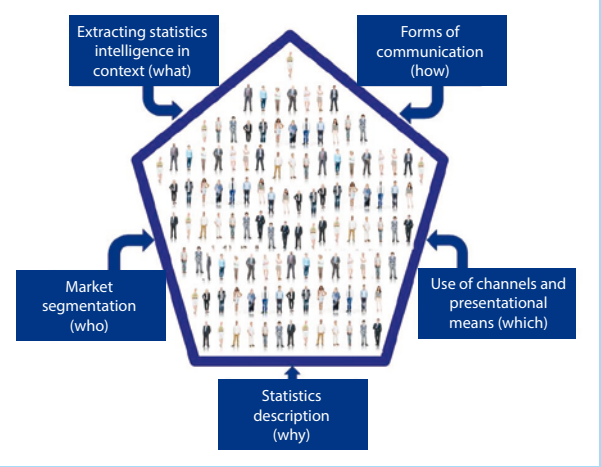
As illustrated in the sections above, efficient communication is an important issue for the future of official statistics in an environment where mass information is available daily, thus increasing the competition that official statistics face with a multitude of other sources of information. However, statistical work is complex and difficult to explain in a concise way. The results of large statistical operations and aggregations may take long before becoming available. The correction of false interpretations may also be the result of a complex process, difficult to explain in a way that is comprehensible to all. In addition, statisticians are not "natural" communicators. These are some of the main "comparative disadvantages" of official statistics vis-à-vis their competitors. ***"Communicating statistics is therefore a strategic asset as an integrated part of the functional independence of producing statistics. Within the same vein, communicating statistics is a fundamental and mandatory obligation contributing to national and international agents' transparency and accountability objectives."*** [30]

Communication must be considered at different and interrelated levels: as an internal objective within the statistical organisations (to share knowledge and create a common culture), as an approach to the relations with users (considering the customer as a central element of the statistical work) and as a collaborative process regionally and internationally.

Building a communication strategy is thus a challenge that each statistical organisation should address. This goes first through the creation of a communication function within the organisation. This should follow a new conceptual approach "as moving from a traditional 'pull' concept, where statistics is released in databases for public use, to a new 'push' concept. This new push concept relates to a new function, whereby the statisticians (a) segregate and provide tailored statistics – what – to (b) different users' groups – who – by (c) facilitating the understanding – why – and (d) simplifying the integration of statistics within workflows and (digital) media – which – and (e) offer statistics descriptions using common language and methodological advice – how." These five elements of building the communication strategy are illustrated in the graph below.

30 Nymand-Andersen, P.: Preparing a statistics communication strategy, Conference of European Statisticians (CES), Workshop on Statistical Data Dissemination and Communication, Geneva, Switzerland (2017).

Box B.2.28: Strategic communication framework for statistical institutions



Now more than ever, timely and relevant data and stories produced by statistical organizations are essential to healthy democratic societies since they remain the only independent, impartial, trusted, and reliable sources of official statistics. For official statistics to be beneficial to society, policy debate and decision making, they must be known, understood, communicated, and used.

Communicating official statistics is more than writing press releases or answering user questions and requests. Statistical authorities need a modern, proactive communication strategy with clearly defined key messages, and must use different channels to reach various target audiences.

A strategic communication function can guide the development and implementation of a communication strategy. This has particular relevance for the world of official statistics, where communication and dissemination have traditionally focused on expert users. With the changing environment, statistical organizations must learn to communicate more effectively and directly with citizens and improve statistical literacy across all audiences.

A productive, professional communication function can help position the statistical organization to succeed in this highly competitive environment. Communication professionals can work in partnership with the statistical organization's leadership board and staff to develop a communication strategy that supports the statistical organization's mission, demonstrates the value of official statistics and enhances the competitive advantage offered by the statistical organization.

Source: UNECE: Strategic Communication Framework for Statistical Institutions (2021)

In this new competition around information, official statistics must adapt their former practices and methods. They have a lot of positive arguments to push forward that may sensitize users to the value of official statistics. Some of these arguments are developed in the box below.

Box B.2.29: The value of official statistics

Official statistics help us understand who we are, have been and are becoming. Official statistics tell the stories of our countries – on population, health, crime and the economy. Over time, they weave a compelling narrative that charts the pace and nature of change in society. Better official statistics make for better decisions, and thus better outcomes. Statistics constitute the indispensable evidence base for high quality decisions – for public policy, service delivery, for companies taking commercial decisions and for people deciding about their everyday lives.

Good official data support trust in government and other institutions. The evidence is that when government decisions are made transparently and on the basis of sound official statistics, citizens are more likely to trust the political process. Official statistics give the basis for holding public and corporate bodies to account. Official statistics help promote equality. Access to information is a democratic and constitutional right. An open and transparent system of public data can help empower citizens across all of society. Official statistics are not the only source of information. On the contrary, the danger is of drowning in data. But official statistics have a number of key and sometimes unique advantages, based on the United Nations Fundamental Principles of Official Statistics, which make them indispensable:

- Official statistics are trusted because they are impartial: Good official data are produced free from political or commercial influence. Those who compile the statistics have no vested interests and are bound by a strict professional duty of impartiality.
- Official statistics are produced to recognized standards: Official statistics are based on open methodologies and produced to internationally recognized standards, and are thus internationally comparable. They are produced transparently so that users can assess their accuracy and reliability.
- Official statistics are firmly based on evidence: They are generally based on survey and/or administrative data sources which are larger in scale than most non-official statistics. They are conducted and resourced according to national need rather than commercial expediency. A global network of experts develops official statistics Statisticians have a strong network to share and develop methods and practices internationally. We profit from countries' best experts coming together to provide faster and better statistics on traditional as well as new areas – human capital, household services, climate change, globalization and many more.
- The benefits of official statistics vastly outweigh their production costs:
- Official statistics are cheap: In the United States, the production of government data is estimated to cost three cents per person per day. In Australia, the costs represent around 0.03 per cent of the overall size of the economy. Such costs are typical.

They are an efficient use of resources: Official statistics represent a reusable public good and their use does not reduce the amount of information available to others. On the contrary, the "network effect" of their being available to all potential users increases their value and benefit.

Benefits of official statistics are of an order of magnitude higher than their cost: The time and attention given by fiscal and monetary authorities around the world attests to the importance of the information official statistics convey. A study in New Zealand estimates that every dollar invested in the census generates a net benefit of five dollars. Benefits of a similar multiple were demonstrated for the 2011 Census of Population in the United Kingdom.

Source: United Nations Economic Commission for Europe (UNECE): Recommendations for promoting, measuring and communicating the value of official statistics (2018)

B.2.3 National Statistics Systems: who does what

B.2.3.1 USERS OF OFFICIAL STATISTICS

Statistical data exists to answer the questions of decisionmakers, whether public or private, national or international. Users of statistics are therefore important members of National Statistics Systems.

Box B.2.30: Users of official statistics

Five groups of users of official statistics can generally be identified:

- **government:** political decisionmakers and officials of central government, local authorities and supranational bodies;
- **general public:** press and citizens;
- **business:** enterprises, business and employers' representatives and trade unions;
- **other countries and international organisations:** including trade partners and development partners;
- **other users:** research centres and non-governmental organisations, whether national and international.

Statistical data are often further analysed following publication, by journalists, researchers, professional analysts and others. The use of official statistics for studying effects of government policies and other issues in society adds value to statistics. Widespread use and analysis of official statistics also serve to verify the quality of the statistics and to raise the authority of the official statistics if the quality is perceived as good.

The core use of official statistics is in preparation, public discussion, implementation, and evaluation of government policies. Therefore, the largest users of official statistics are, as a rule, government agencies and policymakers.

As well as being intensive users of general economic, demographic and other data, business users can demand detailed sector information. As data providers, businesses may have apprehensions about the confidentiality of the data they furnish, in particular whether competitors can deduce facts about their business from published data. In addition, businesses might be concerned about the workload of providing data.

Statistics can be used to analyse the outcomes of different policies that are pursued in comparable countries and regions, provided that the statistics have the same definitions and similar coverage. Consequently, the closer countries work together, for example in an economic union, the greater is the demand for comparable harmonised data. As a result, the EU has often taken the lead in international efforts to harmonise statistical concepts and methodologies and as a rule EU Member States' statistics are more directly comparable than are data from other developed countries. The role of regional and international organisations in statistics is further explored in section B.2.4.

Cooperation partners are key users of statistics, both in allocating funds and in evaluating progress of recipients of funds towards development goals. In low-income partner countries, the statistics user community can be small and there may be few skilled analysts. In this situation, the cooperation partners may become the primary users of statistics, even if they are aware of and guard against this possibility. Because cooperation partners and international agencies need to make cross-country comparisons in order to evaluate the effectiveness of their policies, they are often supporters of regional harmonisation of data, so that it becomes regionally comparable.

B.2.3.2 THE ORGANISATION OF A NATIONAL STATISTICS SYSTEM

The term 'National Statistics System' (NSS) refers collectively to a country's statistics producers, i.e., the National Statistical Offices (NSO) and other producers of official statistics. Mostly, the NSO is at the heart of the statistical system (but, for instance, USA is an exception). The structure of a NSS is generally built on national administrative or legal traditions. The statistical system is normally defined by a Statistical Law, which in particular states the main principle of the professional independence of the NSO. The Statistical Law also defines the obligations (e.g., relating to confidentiality) and rights (e.g., to influence and access administrative data registers) of the NSO. There is no 'right way' to organise an NSS; it is always dependent on traditions and organisation of the national administration.

Three structural elements describe how an NSS is organised:

Functional centralisation: The extent to which the whole process of production and dissemination of official statistics is managed directly by the NSO. In a more functionally centralised system, the NSO and the Central Bank are together responsible for most or all statistical publications and a large proportion of surveys and administrative data collection. In a less functionally centralised system, line ministries such as health and education ministries publish their own statistics and the NSO may have a restricted role in carrying out surveys.

Geographical centralisation: The extent to which statistical functions carried out throughout a country's territory are controlled by the central NSO. In large or federal countries, the NSO may have a federal structure. In particular, data collection may be carried out by state statistical institutions, so that the NSO must maintain consistent standards and methodologies for data collection across all states. With extreme geographic decentralisation, data collection units may be part of state / provincial administrations with no direct links to the NSO.

System coordination: The NSS may be coordinated through a National Council for Statistics which has the responsibility for coordinating statistical activities and methodologies and in which the main producers and users are represented. Such a council may have effective coordinating responsibilities, notably responsibility for authorising surveys, or else may be purely advisory. Alternatively, the NSO may itself be legally responsible for prioritising and coordinating activities and methodologies, in which case it would normally be answerable directly to national authorities. The organisation of the NSS varies between countries. However, the main principle of professional independence of the NSO should always be maintained.

Coordination of statistics activities is very important: without it, different government bodies can organise multiple data collections and produce competing statistics sources, none of which would be credible. Common methodologies are required to achieve coherence of results between different statistical series through the use of common classifications, concepts and methods. Agreed methodologies are also required to meet standards agreed with international organisations. The more an NSS is functionally decentralised, the more system co-ordination becomes important.

As well as providing a framework for formalising co-ordination between data producers, a National Council for Statistics can also be an essential place for dialogue between statistics producers and users. The Council sometimes has an additional role of promotion of statistics and may be requested to give its opinion on issues such as statistical programmes and the legal framework for statistical activity. Alternatively, where there is no Council, a consultative committee can be used for dialogue with statistics users.

The establishment of the 'High-Level Group for the Modernisation of Official Statistics' (HLG-MOS) has driven a substantial push forward towards the modernisation and harmonisation of statistical procedures and methods and efficient organisation of statistical systems and processes. The HLG-MOS involves key actors such as Eurostat, the OECD and UNECE, as well as a large number of national statistical organisations. The HLG-MOS oversees four collaborative Modernisation Groups, covering respectively: Supporting Standards; Sharing Tools; Capabilities and Communication; and the Blue Skies Thinking Network.

The goal of the 'Standards' group is to find ways to develop, enhance, integrate, promote, support and facilitate implementation of the range of standards needed for statistical modernisation. It has developed several inter-related tools that define how statisticians all over the world envisage their work and the collaboration among them and with partners in the statistical system. The group has operational responsibility for the maintenance and development of the Generic Activity Model for Statistical Organizations (GAMSO), Generic Statistical Business Process Model (GSBPM), and the Generic Statistical Information Model (GSIM), and the documentation of the Common Statistical Production Architecture (CSPA):

- The **Generic Statistical Business Process Model (GSBPM)** describes the core business processes undertaken by statistical organisations to produce statistical outputs. It is currently used by more than 50 statistical organisations worldwide.
- The **Generic Activity Model for Statistical Organisations (GAMSO)** extends and complements the GSBPM by describing overarching activities and processes to support the production of official statistical production.

- The **Generic Statistical Information Model (GSIM)** describes the core pieces of information needed by statistical organisations to produce statistical outputs.
- The **Common Statistical Production Architecture (CSPA)** helps statistical organisations create interoperable tools to share within and between them.

To find out more…

- Committee for the Coordination of Statistical Activities (CCSA)
- High-Level Group for the Modernisation of Official Statistics (HLG-MOS), including the Generic Statistical Business Process Model (GSBPM); the Generic Activity Model for Statistical Organisations (GAMSO); the Generic Statistical Information Model (GSIM); and the Common Statistical Production Architecture (CSPA)
- About the various traditional ways in which NSSs are organised, see 'Models of Statistical Systems' by Roger Edmunds (2005).

B.2.3.3 STATISTICAL DATA PRODUCERS

B.2.3.3.1 The National Statistical Office

The National Statistical Office (NSO) is the main body of the NSS, the core producer of official statistics. Its responsibilities may vary, as explored in section B.2.3.2.

The NSO can have the status of a ministerial department or be an autonomous government body with its own budget. The regulatory authority of an NSO also varies from one country to another: Presidency, Prime Minister, a Minister in charge of the economy, finance or planning or a Parliamentary Committee. In some countries, the NSO is part of a ministerial department and is not directly responsible to a Minister. The statute of the NSO and its administrative attachment influence its autonomy vis-à-vis the political power and its authority within the NSS. NSOs can be organised by function, by statistical subject or a mixture of the two. Whatever the legal and administrative structure of an NSO, the important elements for the effective functioning of an NSO are:

- guarantees of professional independence
- assured financial support
- a clear public mandate from government
- operational flexibility as to how it meets that mandate.

A wide range of partner country NSO structures exists. Francophone partner countries generally reflect the structure of the French NSO, INSEE. Anglophone partner countries have varying organisational structures that mostly do not replicate current or historical British practice.

National Statistical Offices may and arguably should also play a coordinating role for the NSS and usually act as representatives of the NSS in international meetings. However, representation in international meetings depends on the structure of the NSS. When other official bodies are responsible for certain statistics they may be the national representative in such meetings, e.g., the Ministry for Internal Affairs for migration and asylum statistics or the Customs Service for classification of international trade products.

A primary group of challenges facing NSOs in many partner countries concerns their financing. Financial problems may consist of:

- **Insufficient** budgets,
- **Late** authorisation or release of funds; or
- Lack of **multi-year funding** coupled with **unpredictable** annual budgets.

Good practice in **statistical governance** is of strategic importance. If an NSO forms part of a government ministry and does not have direct responsibility at ministerial level, it is unlikely that it will be sufficiently independent to publish data without political review or that an appropriate policy-level dialogue can develop.

Operational flexibility covers the ability of the NSO to hire appropriately qualified staff at reasonable salaries, set its own internal structure (hence have the ability to restructure) and not be overly constrained to use government common resources, such as printing facilities, where their use would prevent the NSO from meeting its statistical objectives.

These issues are explored in greater detail in chapter C.6.

To find out more…

about the organisation of NSOs in developed and partner countries, visit the websites of the national statistical offices and other organisations producing statistics and study their organisation charts. Some examples:

- France: Institut national de la statistique et des études économiques (Insee) organisation chart
- United Kingdom: UK Statistics Authority organisation chart
- USA: U.S. Census Bureau organisation chart
- Botswana: Statistics Botswana - Directorates
- Mozambique: Instituto Nacional de Estatística - organisation
- The United Nations Statistics Division (UNSD) maintains a complete overview over National Statistical Offices Websites and their profiles.
- About how an NSO is organised, see: Handbook on Management and Organization of National Statistical Systems, United Nations Statistical Division (2021)

B.2.3.3.2 Other producers of official statistics

The organisation of the National Statistical System governs which statistics are produced by other bodies than the NSO. All producers of official statistics should be covered by the fundamental principles and statistical codes of practice in the same way as NSOs. Their production of official statistics is normally included in the national work programme for official statistics.

Central banks are responsible for overseeing the financial and banking system. Thus, they are generally responsible for compiling monetary and financial statistics. In some countries, the central bank is also responsible for the balance of payments statistics, as the primary source for this is the Central banks' report on financial transactions with abroad. In addition, in some countries, the national accounts are published by the central bank. The central bank, together with the finance ministry, is the contact point and dialogue partner for the International Monetary Fund.

Line ministries such as agriculture, health, education, customs, or social security may have statistical services. The justification for producing statistics in these ministries is that they have in-depth knowledge of the field and of any specific issues or problems which need to be considered. They also have a close contact with the actors in the area. Thus, they are in prime position to validate and assure the quality of data. In particular, data from administrative sources, such as hospital data, are usually collected by the line ministry, but may be processed and published either by them or by the NSO. Whatever way the tasks are assigned to institutions, the line ministry and the NSO need to coordinate methodologies and classifications so that the resulting data are coherent with statistics from other sources such as health surveys.

Surveys that are funded by external assistance and are **organised independently of national statistics** operations constitute a further group of statistics production. This type of action is particularly prevalent in partner country health statistics where there is urgent need of data but little national capacity to collect it. Such surveys may be executed by e.g., central banks, line ministries or other public or private organisations.

B.2.4 The role of international and regional organisations with statistical activities

B.2.4.1 INTERNATIONAL ORGANISATIONS

B.2.4.1.1 Overview

Generally, international organisations that undertake statistical activities carry out the following tasks:

- Development and agreement on international standards for statistical activities;
- Compilation and dissemination of globally comparable statistical information;
- Support for countries' efforts to strengthen their national statistical systems through technical and financial means;
- Coordination of international statistics-related activities.

The United Nations (UN) acts through the United Nations Statistics Division (UNSD), a part of the Department of Social and Economic Affairs, as a coordinator of the global statistical system and a repository of certain international statistical data. Furthermore, certain UN specialised agencies perform statistical activities, notably compiling globally comparable data and working in their respective fields of competence on methodological improvement.

The Partnership in Statistics for Development in the 21st Century (PARIS21) aims at developing a culture of evidence-based policy making which seeks to improve governance and government effectiveness in reducing poverty and achieving the Sustainable Development Goals (SDG). PARIS21 focuses on promoting high-quality statistics and making the data meaningful by informing development policy decisions and managing their implementation. The consortium's role is to foster more effective dialogue among those who produce development statistics and those who use them. A key working area is to support partner countries in designing and successfully implementing a National Strategy for the Development of Statistics (NSDS).

Based upon a decade of experience, and building upon this success, the NSDS guidelines have been revisited in order to enhance and adapt the tool based on assessments made and the views of users and producers within the changing development context. On 2 April 2014, the new NSDS guidelines were officially launched at the PARIS21 Annual Meetings, marking the beginning of the next chapter in the NSDS story.

These new guidelines reflect several innovations that should broaden their scope and usefulness, including:

- A dedicated website that allows for the collection of suggestions and examples of good practices on an ongoing basis and includes links to documents produced by national statistical offices and international organisations.
- Translation into French, with plans in place for translation into Spanish.

- Restructuring into steps that are required when designing an NSDS (sequenced steps) and those that are also part of the regular statistical activities of a country (permanent steps); this supports the Guidelines dual nature as both a process and a product.
- Specific sections on key areas, such as implementation, fragile and small states, sectoral statistics, infra-national strategies, regional strategies, gender statistics and open data.

Other global organisations that have significant statistical methodology or coordinating roles are the International Monetary Fund (IMF), the World Bank and the Organisation for Economic Co-operation and Development (OECD).

Box B.2.31 illustrates the development cooperation roles of certain UN agencies, other international and regional organizations, involved in support for statistical capacity building, also showing selected publications and databases. In addition to that, PARIS21 publishes the 'Partner Report on Support to Statistics', in order to strengthen the partnership of statistical actors.

The coordination role of international organisations means that they are able to introduce statistical initiatives on a regional or a global scale. Also at national level, international organisations sometimes take the lead among the donors in coordinating statistics interventions.

Box B.2.31: Activities of international organisations in statistical cooperation

Organisation	Main statistics related activities
United Nations Economic Commission for Africa (UNECA), African Centre for Statistics (ACS) and the Statistical Commission for Africa (StatCom – Africa)	• Co-ordination of statistical activities in the related region • Technical assistance for member states
United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), Statistics Division	
United Nations Economic Commission for Europe (UNECE), Statistics Division	
United Nations Economic Commission for Latin America and the Caribbean (UNECLAC), Division for Statistics	
United Nations. Economic and Social Commission for Western Asia (UNESCWA), Statistics Division	
United Nations Conference on trade and Development (UNCTAD), UNCTADSTAT	• Reference manuals on statistical standards, concepts and guidelines on international trade, infrastructure for development, trade efficiency, globalization and related areas; • Develop and maintain the SDG Trade Monitor • Together with UN Women and ILO, develop the policy brief 'Gender and Trade: Assessing the Impact of Trade Agreements on Gender Equality' • Development, training in the WITS (World Integrated Trade Solution) software, bringing together statistics and other trade information; • Development, maintenance, training in the ASYCUDA (Automated System for Customs Data) software, covering foreign trade procedures and generates trade statistics; • Debt Management Programme (DMFAS), helping governments of 'partner country economies building their debt management capacity; • Collecting comprehensive and comparable Non-Tariff Measures (NTMs) data in 109 countries
United Nations Development Programme (UNDP)	• Statistics for Human Development Reports; • Support for general statistical capacity development, especially linked to poverty monitoring capacity and capacity to monitor progress towards the SDGs; • Censuses and socio-economic surveys; • Use of indicators in policy formulation; • Raise statistical literacy.
United Nations Population Fund (UNFPA)	• Support to Population and Housing Censuses; • Support to Data for Development: monitoring and evaluating progress towards the SDGs, in particular for population, health and gender aspects.
United Nations International Children's Fund (UNICEF)	• Technical assistance for the Multiple Indicator Cluster Surveys (MICS) household survey programme to monitor the situation of children and women. MICS provides statistically sound, internationally comparable estimates of 101 indicators, including 21 MDG indicators. • Support on monitoring and evaluation related issues and data analysis, as well as organisation of training.
World Tourism Organisation (UNWTO-Tourism)	• Development of national Systems of Tourism Statistics (STS) following the International Recommendations for Tourism Statistics 2008 (IRTS 2008); • Design of the required guidance, initiatives and tools for the implementation of STS in countries; • Dissemination and promotion of the Tourism Satellite Account (TSA) conceptual background for economic analysis, in line with the TSA Recommended Methodological Framework 2008 (TSA: RMF 2008); • Launched the initiative Towards a Statistical Framework for Measuring the Sustainability of Tourism (MST).

Box B.2.31: Activities of international organisations in statistical cooperation

Organisation	Main statistics related activities
International Labour Organisation (ILO), Department of Statistics	• Compiling and producing labour statistics, which are disseminated through ILOSTAT; • Setting international standards for labour statistics through the International Conference of Labour Statisticians (ICLS); • Providing technical cooperation, assistance and training in labour statistics; • Support policy development and implementation within the "Decent Work" agenda.
United Nations' Food and Agriculture Organisation (FAO)	Technical assistance in agricultural statistics projects in partner countries: • Agricultural censuses; • Systems of agricultural statistics and institutional strengthening; • Agricultural statistics for food safety and early warning information systems; • Statistical data processing and statistical databases; • Training and capacity building.
Organization for Economic Cooperation and Development (OECD)	• Coordination of statistical activities both within the Organisation and with other international agencies; • Provision of essential methodological guidelines; • The Better Life Initiative, measuring well-being and progress, including the How's Life? report and the Better Life Index; • The Gender Data Portal includes selected indicators on gender inequalities in education, employment, entrepreneurship, governance, health and development.
United Nations Educational, Scientific and Cultural Organisation (UNESCO), and its Institute for Statistics (UIS)	Assistance in statistical capacity development on education, science and technology, culture and communication, including: • Responsibility for SDG 4 indicators on education and literacy; • Improving the collection, quality and use of education data for policymaking purposes; • Regional workshops on data collection, concerning statistical and policymaking issues in education and in science and technology.
World Health Organisation (WHO)	• Support the strengthening of national health information systems; • Operates the Global Health Observatory (GHO), providing health data for SDG 3; • Technical assistance for data collection and analysis of health statistics; • Develops concepts, guidelines, classifications and carries out training programmes, including workshops and seminars.
World Bank	• Support for statistical capacity development in partner countries, including financial assistance, technical assistance and advisory services; • Assist countries in implementing specific household survey programs, such as the Living Standards Measurement Study (LSMS), which provide data on poverty in partner countries, as well as Household and Population Censuses.
World Trade Organisation (WTO)	• Cooperation activities in statistics primarily directed to government officials, for trade negotiation; • Plays an important role in monitoring progress in attaining the trade-specific targets in the Sustainable Development Goals (SDGs); • Support activities for primary data production and compilation.
International Monetary Fund (IMF)	• Technical assistance for statistical capacity development in macroeconomics, monetary and financial statistics, balance of payments, foreign debt, government finance statistics; national accounts and price statistics; financial soundness indicators; • Support to countries to develop their statistical systems using frameworks, such as the Special Data Dissemination Standard (SDDS), the Enhanced General Data Dissemination System (e-GDDS) and the Data Quality Assessment Framework (DQAF); • Offers courses, workshops, and seminars in Washington DC and through a network of Regional Training Centres (RTCs) and Regional Technical Assistance Centres (RTACs).

To find out more…

About the coordinating role of the UNSD see:

- About the UNSD

Introductions to other global institutions with statistics roles include:

- Key impact areas of PARIS21
- World Bank development topics
- IMF statistical activities
- OECD Statistics and Data Directorate
- UNESCO Institute for Statistics (UIS)
- UNICEF data

B.2.4.1.2 Data compilation and dissemination

The United Nations' specialised agencies and other regional and international organisations compile and publish data in their fields of competence based on information they receive from national authorities. As a rule, the international agencies process the data by making adjustments to ensure comparability across the countries, producing estimations for missing data and disseminating the results through public databases and publications. In certain cases, the UN specialised agencies may also make forecasts of economic data.

Some of this data are used for high profile development aid allocation and investment decisions. Data in this category include the SDG Global Database and the IMF's International Financial Statistics. Major international data sources are shown in Box B.2.32.

Since the data has been processed to achieve comparability, international data publications may not match the national statistics publications of partner countries. There is a continuing debate between partner countries and international organisations, especially those responsible for sections of the SDG Global Database. The issues concern data transmission from partner countries to the international organisations and the transparency of the data processing and estimation methodologies used by the international organisations to harmonise statistics across countries for this database.

Box B.2.32: Selected publications and databases of international organisations

United Nations

- The United Nations Statistics Division (UNSD) SDG Global Database covers a wide range of social, economic and environmental indicators for agreed policy goals
- The UNSD Statistical Yearbook includes a 'World and region summary' of key aggregates. Other sections cover population and social questions, national economic activity and international economic relations.
- The UNSD Demographic yearbook contains official statistics on population from national authorities.
- The UNSD external trade database COMTRADE contains data on each country's international trade in goods, per partner country, type of flow and product.
- The United Nations Population Division (UNPD) and its World population prospects database provides worldwide population series, per continent, region and country.
- United Nations Educational, Scientific and Cultural Organisation (UNESCO) Institute for Statistics (UIS) provides data on education, science & technology, culture, communication and literacy, in particular related to SDG 4 on education.
- The Food and Agriculture Organisation (FAO) provides food and agriculture data through its FAOSTAT database and publishes a Statistical yearbook and pocketbook
- The International Labour Organisation (ILO) statistical database ILOSTAT contains statistical information on active population, employment, working conditions, work disputes and household living conditions.
- The World Health Organisation (WHO) provides data on population, health, medical infrastructure, demographic and socioeconomic indicators through its Global Health Observatory and World Health Statistics.

World Bank

- The World Bank provides Open Data on global development with free and easy access to statistics and key development indicators, including the World Development Indicators.

International Monetary Fund

- International financial statistics and balance of payments statistics yearbooks, as drawn up by the International Monetary Fund (IMF).

OECD

- The OECD Data covers a wide range of statistics on developed countries, covering data on agriculture, development (including Official Development Assistance), economy, education (including the PISA study), finance, government, Health, innovation and technology, jobs and society (demography, inequality migration, population by region, social protection).

African Development Bank

- The AfDB's Open Data for Africa platform facilitates access to quality data for managing and monitoring development results in African countries. To strengthen the statistical systems and promote open access to statistics across Africa, Open Data for Africa has been extended to cover all African countries. Data cover a wide range of different topics.

Eurostat

- Eurostat's website provides free access to the Eurobase database, containing a wide range of harmonised data and metadata for European Union and Euro Area aggregates, EU Member States, EFTA countries and candidate countries and potential candidates. A wealth of metadata are provided such as classifications, code lists, and concepts and definitions used.

Regional integration, especially trade agreements, creates demand for comparable data. Regional organisations such as the EU disseminate regionally harmonised and therefore comparable data from their Member States. The European Statistical System's approach to harmonisation is often seen as a model in other regions.

B.2.4.1.3 International statistical concepts and methods

To produce statistics that are comparable across countries, common concepts, classifications, and methods need to be defined and implemented. For example, concepts of unemployment, grey economy and foreign population have been defined at international level. Established international nomenclatures and classifications include those covering the classification of economic activities (ISIC), the classification of occupations (ISCO) or the classification of diseases (ICD). Similarly, standard methods for carrying out statistical actions are described in international manuals.

Revisions of methodologies and classifications are carried out periodically through dialogue among statisticians from national and international institutions, often coordinated through the United Nations Statistics Division. The periodic revisions of the System of National Accounts (SNA) are among the most complex of these activities: revisions are dated 1968, 1993 and 2008. The purpose of methodological updates in general is to ensure that the methods and concepts used in the statistics remain relevant to the economic, social or environmental issues being measured. In addition, greater attention is now being drawn during methodological revisions to the needs of partner countries. One such need is to ensure that partner countries with limited statistical resources are able to produce statistics that meet the international standards while avoiding unnecessary complexity. Furthermore, statistical concepts need to be appropriate to the economic and social conditions found in partner countries.

Box B.2.33: What metadata can do for you

Metadata is Information that is needed to correctly use and interpret statistics; they are data that describe other data ('ordinary' data become metadata when they are used in this way). Generally, metadata can be split in structural and reference metadata.

Structural metadata is used to identify, formally describe or retrieve statistical data: Examples are: dimension names, variable names, dictionaries, dataset technical descriptions, dataset locations, keywords for finding data etc. Structural metadata includes e.g., the titles of the variables and dimensions of statistical datasets, as well as the units employed, code lists, data formats, potential value ranges, time dimensions, value ranges of flags, classifications used, etc.

Reference metadata (sometimes called explanatory metadata) describes the contents and the quality of the statistical data from a semantic point of view. It includes explanatory texts on the context of the statistical data, methodologies for data collection and aggregation, as well as quality and dissemination characteristics.

There are several international frameworks for structuring and disseminating reference metadata, including the IMF's Enhanced General Data Dissemination System (e-GDDS) and Special Data Dissemination Standard (SDDS) as well as the Statistical Data and Metadata eXchange (SDMX – metadata standard of the ESS).

Metadata give crucial insights into the data, which is vital for understanding how data can be used, whether they are comparable with other statistics and how reliable analysis based on them is likely to be. For example, metadata should give answers to questions such as:

- What is the source of the data; sample survey, census, administrative records or a combination of several sources? Who is producing the statistics?
- For whom and for what purpose are the data compiled? Which persons or entities are covered by the statistics, and how are the characteristics defined?
- What is the quality of the data? Do they follow international standards and classifications and statistical good practice?
- What is the frequency of the data collection? Is it certain that the data collection will be repeated with regular frequency? Is there a legal basis for the data collection?
- Are the statistics comparable with corresponding statistics in other countries? Are they comparable with other national statistics?

More information on metadata can be found on Eurostat's metadata page and in the European Statistical System handbook for quality and metadata reports, re-edition 2021.

A valuable source for information on the quality and availability of data in individual countries is the IMF's Enhanced General Data Dissemination System (e-GDDS) and Special Data Dissemination Standard (SDDS). The GDDS is mainly used by partner countries, whereas SDDS is used mainly by developed countries and emerging countries. The objective of the GDDS is to encourage the production and dissemination of complete sets of data with widest coverage, based on international methodologies. The GDDS contains reference metadata such as explanatory texts on the context of the statistical data, methodologies for data collection and aggregation, as well as quality and dissemination characteristics. This information covers both general system information and information on some selected statistical areas. GDDS provide key information on the overall state of countries' statistical systems and their adoption of international methodologies and classifications. This is valuable input for planning and evaluation of technical assistance in statistics. GDDS metadata are also useful to co-ordinate, assess, implement and evaluate statistical programs across agencies and donors. Further details on statistical quality can be found in section C.6.3 and on IMF's Dissemination Standards Bulletin Board (DSBB).

In partner countries, **international classifications and methodologies are not always fully adhered to**, or **earlier versions of the key classifications are used**. This is often because major statistics actions such as s**urveys have not been carried out** for some time. Good practice in partner countries is to implement methodological or classification updates when there is a major statistical action, such as periodic survey or census or a change in an index base year. **Surveys therefore need to be sufficiently well planned** to permit the adoption of current international classifications. Achievement of all objectives of a survey requires close collaboration of specialized statisticians. Attainment of this level of cooperation is a **senior management task**.

Support in these tasks is provided through the International Household Survey Network (IHSN), which is a partnership of international organizations seeking to improve the availability, quality and use of survey data in partner countries and by the Accelerated Data Program (ADP) which provides technical and financial support to documentation and dissemination of survey data and helps partner countries to set up national survey databanks.

In the past, classification changes often required significant updates to computer systems, although current systems are more easily changed. In partner countries, adoption of a new index base or classification still usually requires computer systems to be updated.

Internationally agreed concepts and methods express a minimum consensus: where appropriate, some flexibility for countries in meeting the standards is permitted. In particular, classifications such as trade classifications are mandatory at more aggregate levels, with some flexibility permitted at detailed level. However, for direct comparability between country statistics at detailed level, greater harmonisation not only of classifications but of concepts and methods generally is required. Regional partnerships require increased statistical harmonisation in order to prepare, monitor and evaluate the partnerships' common policies.

Due to the EU's high level of economic integration, Europe has become a leading force in international harmonisation of statistics. National accounts represent a good example of successful harmonisation. The global standard for national accounts is the 2008 System of National Accounts (2008 SNA), replacing the previous SNA93 and responding to changes in the economic environment. Based on the 2008 SNA, the European System of Accounts 2010 (ESA 2010) has been developed and provides the legal basis for the EU National Accounts statistics since 2014. ESA 2010 is compatible with the 2008 SNA and provides for more closely defined sources, methods and data transmission.

In May 2008, Eurostat together with the UN Statistical Division organised a high-level conference on national accounts in the context of development cooperation. The conference concluded by endorsing a series of Recommendations which were then passed on to the Inter-secretariat Working Group on National Accounts (ISWGNA) for further consideration before submission to the UN Statistical Commission in February 2009. In the 2nd quarter of 2009, ISWGNA finalised the adoption of the 2008 SNA and used the following selected principles laid down by the Luxembourg Recommendations to underline the proposed implementation strategy of the 2008 SNA:

- strategic planning;
- coordination, monitoring and reporting;
- improving statistical systems.

The ISWGNA principle of improving national statistical systems is undertaken providing support, focusing on the collection and processing of basic source data and in so doing, improving national accounts at the institutional and international level through undertaking the following tasks:

- use of common tools for the production of national accounts;
- preparing manuals and handbooks.

UNSD agreed on the 2008 SNA in February 2008. It was implemented in 2014. To support partner countries in developing their national accounts in compliance with the 2008 SNA rules and recommendations, Eurostat has developed a practical handbook called "Essential SNA: building the basics". This is a practical handbook mainly aimed at a relatively early stage of implementation of 2008 SNA (Level 0 as defined by the ISWGNA), but countries at higher levels can also find it useful, for the training and re-training of their staff, in particular newly employed staff members. Synthetic information on key topics is available on Eurostat's "Statistics explained" web pages, under the title "Building the System of National Accounts".

Regional trade agreements and increased integration in the global economy is increasingly leading to a need for statistical harmonisation in partner countries. In many countries, adherence to international statistical classifications, concepts and methods still needs improvement. However, such

harmonisation, which can be integrated with measures to adopt general international statistics standards, places further demands on the often limited statistical capacity.

To find out more…

about countries' use of statistics methodologies and classifications:

The IMF's Enhanced General Data Dissemination System (e-GDDS - mostly developing countries) and Special Data Dissemination Standard (SDDS – mostly developed countries) webpages on the Dissemination Standards Bulletin Board (DSBB) show each country's structured presentation of their statistical metadata – the methodologies, classifications and nomenclatures used covering some selected statistical areas.

A comprehensive directory and explanation of international statistics classifications and nomenclatures is provided by Eurostat's RAMON metadata server.

The International Household Survey Network seeks to improve the availability, quality and use of survey data in developing countries, while the Accelerated Data Program (ADP) provides technical and financial support to documentation and dissemination of survey data.

More info on national accounts implementation:

- System of National Accounts (SNA) (website)
- Luxembourg Recommendations (2008)
- Eurostat: "Essential SNA: building the basics" (2014 edition)
- Eurostat: Building the System of National Accounts (Statistics Explained online article series)

Some key classifications:

- International classification of economic activities (ISIC Rev. 4) (2008)
- International classification of occupations (ISCO) (website)
- International Standard Classification of Education (ISCED 2011) (website)
- International classification of diseases (ICD-11) (website)

B.2.4.2 REGIONAL ORGANISATIONS

Generally, regional organisations comprising partner countries undertake statistical activities in order to:

1. Advise policy makers on interpreting statistics relevant to regional policies;
2. Develop and produce harmonised statistics in fields where comparable statistical data is needed to shape regional policies;
3. Exploit economies of scale by virtue of undertaking joint actions where the respective member states have similar statistical needs.

As a rule, a statistics unit of a regional organisation typically needs to have access to data that originates from both the National Statistics Systems of their member states and from international organisations. These data sources are needed to present, compare, and explain policy-relevant statistics that cover both the member states of the region and other countries. Regional statistical units, therefore, require effective communication of current data with their member states' NSOs, as well as access to international statistical databases.

It is very confusing to data users when there are differences between national and international sources for the same statistics. Also, when data from various countries are presented in the same table, users expect data to be comparable; they need to be properly informed about the reasons if this is not the case.

Increased data comparability between countries is achieved by adopting consistent concepts, methods, and classifications. This process is known as 'statistical harmonisation'. Harmonisation requires agreement on common statistical classifications, methods, and systems. This is a long, expensive process that usually requires extensive consultation. Therefore, harmonisation in partner countries is usually focusing on statistics in key policy areas of regional integration. Statistics on international trade in goods and on prices are common priorities, as they are central to regional trade agreements.

The European process of economic and monetary integration favoured the creation of a European Statistical System (ESS). The process of economic and legal harmonisation of statistics in many regions is broadly comparable. The challenges of coordination are at least as great as they were in Europe. However, the financial resources and the availability of skilled personnel are much more restricted.

The majority of regional development organisations have some statistical personnel. The functions of the statistics unit can range from being limited to providing advice within the organisation to leading the production of regionally harmonised statistics. The UN regional organisations (e.g., ECLAC, UNECA) also have statistical functions and in some cases organise regional statistical activities.

When the number of professionals in each member state needing a specific training is small, it is often more efficient to organise training sessions at regional level. Examples of this are training in tailored software for specific statistical domains, e.g., international trade or national accounts. Regional organisations can coordinate training programmes to meet the needs of its member states' NSOs. Adoption of common statistical processing software also utilises economies of scale, both in software development, introduction, maintenance, and training. Various institutional arrangements have been adopted in different regions for statistics-related training. This issue is considered further in section C.9.6.

Box B.2.34: Example of a regional organisations with a statistical component: the West African Economic and Monetary Union (UEMOA)

The West African Economic and Monetary Union (UEMOA) provides an example of the statistical functions of a regional organisation. Eight States of West Africa, which already shared a common currency, decided in 1994 to increase their economic integration by signing a Treaty creating the UEMOA. The resulting Treaty provides for a multilateral monitoring of eight statistical indicators in support of policy convergence. The following four statistical indicators rank first:

- budget surplus / deficit as % of nominal GDP;
- annual inflation rate;
- public debt as % of the nominal GDP;
- arrears of annual payments.

The statistical data must be comparable across all eight Member States. The UEMOA Commission supports its Member States in harmonising the statistical data used for producing these indicators. It has benefited from EU regional integration support programmes.

UEMOA is financing an enhancement of the regional statistical system. This programme aims to (i) improve, harmonise and modernise regional statistical production; (ii) to implement and operationalize the institutional arrangements for follow-up in each domain; (iii) to reinforce the institutional and technical capacities of the UEMOA Commission in the field of statistics. The actions are be implemented in the framework of this horizontal statistical programme, organised on four axes:

1. Reinforcement of policy convergences;
2. Poverty and social cohesion (follow-up of regional PRSP and MDG's)
3. Common market establishment;
4. Institutional support

Concrete activities include: the adoption of a Harmonised Consumption Price Index (HCPI); publication of a regional consumption price index in the form of monthly and biannual notes; production and publication of biannual reports on the implementation of the multilateral monitoring system; adoption of methodologies for calculating the Gross Domestic Product (GDP); creation of a data base on competitiveness; harmonisation of sectoral, social and environmental statistics; creation of a regional business register; and promotion of gender statistics and governance. Since 2015, the Sub-Saharan African Observatory for Economy and Statistics (AFRISTAT) together with the UEMOA Commission has supported the UEMOA Regional Statistical System (RSS) and the NSOs of its member states in the implementation of the Regional Statistical Programme (PSR-UEMOA) 2015-2020, with a special emphasis on a general improvement of the statistics and in particular the national accounts.

The UEMOA Regional Statistical Committee (Comité Régional de la Statistique (CRS)), set up by the Council of Ministers in 2013, plays a central role in the plays a central role in the design and monitoring of the statistical programmes of UEMOA.

Source: UEMOA website – 7th meeting of the Regional Statistical Committee, 15-17 July 2019 (in French)

Box B.2.35: Selected regional organisations with statistical activities

Africa

AfDB	African Development Bank
AFRISTAT	Economic and Statistical Observatory of Sub-Saharan Africa
AU	African Union
BCEAO	Central Bank of West African States
BEAC	Banque des États de l'Afrique Centrale
CEMAC	Communauté économique et monétaire de l'Afrique centrale
COMESA	Common Market for Eastern and Southern Africa
ECOWAS	Economic Community of West African States
SADC	Southern African Development Community
UEMOA	Union économique et monétaire Ouest Africaine

Americas

IADB	Inter-American Development Bank
CAN	Comunidad Andina de Naciones
MERCOSUR	Mercado Común del Sur
SIECA	Secretaría de Integración Económica Centroamericana
CARICOM	Caribbean Community and Common Market

Asia

ADB	Asian Development Bank
ASEAN	Association of South East Asian Nations

Europe

Eurostat	Statistical Office of the European Union
ESS	European Statistical System

Euro-Asia

CIS STAT	Interstate Statistical Committee of the Commonwealth of Independent States

Pacific

SPC	Secretariat of the Pacific Community

UN regional organisations not included

B.3 Statistics and indicators in the European Commission development aid process

B.3. Statistics and indicators in the European Commission development aid process

The chapter in brief

This chapter starts with a presentation of the typology of indicators used by the European Commission. This is useful to understand which types of indicators are used to measure different phenomena.

It then presents how indicators and statistics are needed at all stages of the Commission cooperation action, dealing step by step with the subsequent stages of the programming cycle: programming, identification, formulation, implementation, evaluation. It also deals with the importance of reliable, relevant, timely and accurate data and a sustainable public financial management system for budget support. It mentions the central role of the SDG global monitoring framework and the SDG indicators for defining and mainstreaming national results frameworks, as basis for development programmes and joint programming and implementation.

B.3.1. The role and importance of statistics and indicators in the aid context

Over the last decades, there has been an increased focus on the effectiveness of development aid (for more details, see chapter B.1.). In this context, the need for reliable statistics has increased strongly, both for monitoring during activities and for evaluation of results after their completion. In this process the emphasis has shifted strongly from external monitoring of processes and evaluation of impacts by donors to using and strengthening partner countries' own results frameworks and monitoring and evaluation (M&E) systems, developed in line with their own development objectives and policies. Many of these are closely aligned with the global monitoring framework for the SDGs, so as to produce the required data for measuring progress towards the SDGs.

The existence of result-oriented reporting and assessment frameworks in partner countries and strengthened linkages between development strategies and budget processes are central in this process. The national capacity for developing and operating such results frameworks should be placed within the overall context of national capacity development for sustainable outcomes. Conditions should be based on the partner country's own development objectives. Transparent, country-owned results frameworks should be the central tool to assess progress and impact, based on a manageable number of output and outcome indicators drawn from the development objectives and goals of the partner country itself.

This process has been backed by donors as well as partner countries seeing the need to deliver more and better aid and increasing the effectiveness of aid in terms of impact in priority areas. If full use of the country results framework is not possible, donor(s) should discuss with the country how the national capacity could be strengthened, including any necessary assistance or changes.

The change from conditionality based on external results frameworks to conditionality based on national frameworks linked to the country's own development objectives and policies has led to the emergence of new indicators. The 'traditional' measurements of direct aid input (such as person-days or budget allocated for a specific aid project) and results (such as number of hospital places, number of educated nurses) have been supplemented or sometimes even replaced. The new indicators address the results and overall impact from the beneficiary's point of view (e.g., access to basic medical services, decreasing death rates from treatable diseases) using the country's own results measurement systems and in line with the country's own development strategy.

A close monitoring and evaluation (M&E) of activities and projects needs data of good quality. The data must be appropriate for the task: they must be relevant, reliable and available when needed and expected. For evaluating development over time, the data must be comparable over time. For wider benchmarking uses, the data should be comparable between countries and regions. The importance of good data and good indicators goes well beyond efficient monitoring and evaluation. Quality statistics are:

- vital for the development of evidence-based development policies;
- crucial for the priorities contained in national development strategies;
- essential for efficient public administration;
- (if trusted by the public) increasing transparency and promoting accountability of the government, which are vital to good governance.

Thus, availability and reliability of relevant statistics and the capacity of countries to produce these are important to the EU's support for good governance, transparency and accountability. (For more information on quality of statistics, see section C.6.3). Assurance of reliability is based on the UN Fundamental Principles of Official Statistics, as well as regional adaptations of these (e.g,. the African Charter on Statistics, the Code of Good Practice in Statistics for Latin America and the Caribbean) and others (see section B.2.1 for more details).

B.3.2. Typology of development indicators

The EU and its Member States are committed to the joint programming of development cooperation to address national development objectives. The resulting joint strategy is fully aligned to the partner country's national development plan. It is therefore critical that its result framework has the capacity to provide relevant indicators to define baselines, monitor progress, measure output, and assess impact of the national development strategy. The use of carefully selected outcome indicators is crucial for development partners and partner countries to measure progress against the country's own development objectives.

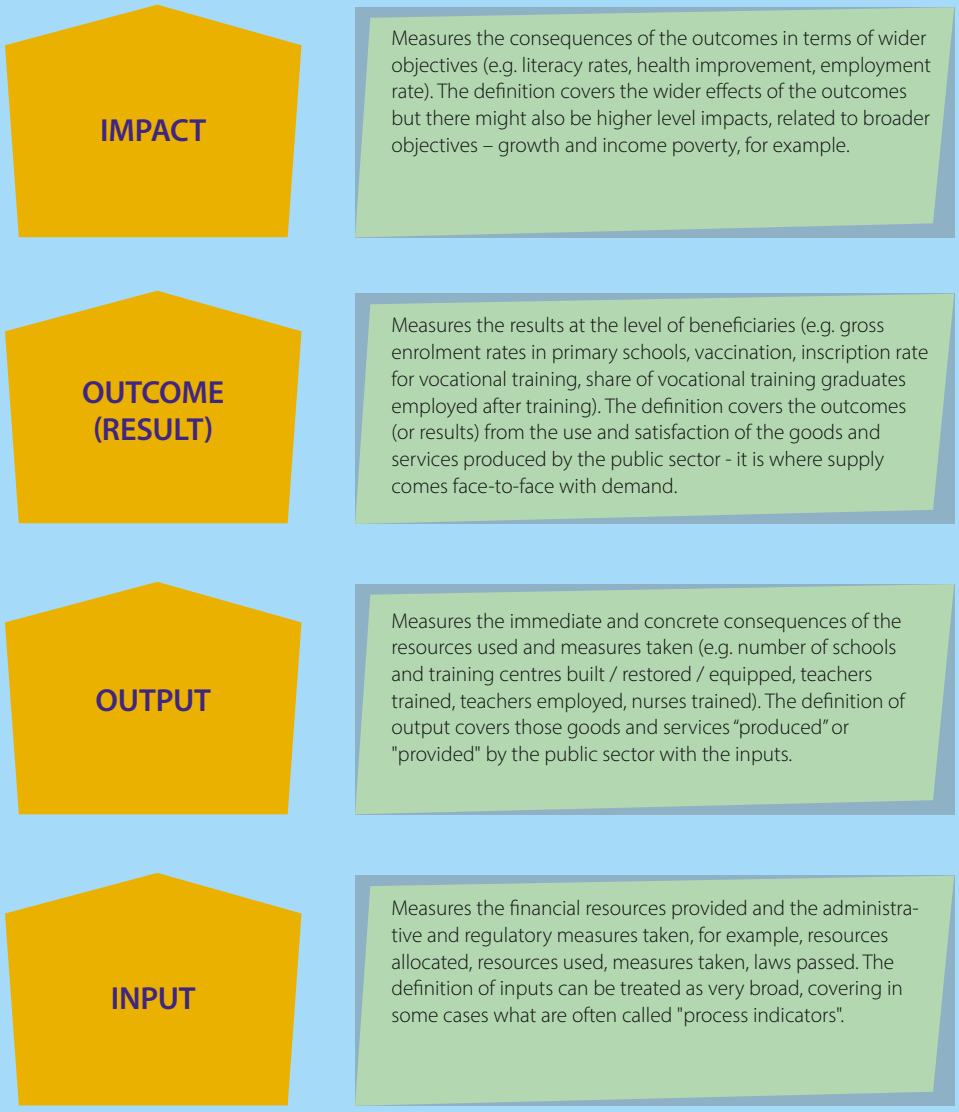
In order to classify an indicator according to what state or event it measures, the European Commission uses the OECD-DAC's typology of indicators. This classifies each indicator as measuring an "input", an "output", an "outcome" or an "impact". Each indicator falls into one and only one of the types.

These types of indicators are all relevant for policy makers and development practitioners. A full diagnosis of progress and weaknesses of a sector (or programme or project, or country) will require a set of indicators that includes all the four different types identified, which are:

- Input Indicators
- Output Indicators
- Outcome Indicators
- Impact Indicators

Box B.3.1 presents a visualisation of the main characteristics of the OECD-DAC typology.

Box B.3.1: Typology of indicators



Some donors use other definitions or names for the different types of indicators. For example, some donors use the term "outcome" or "result" to refer to what the above typology calls "impact". When entering into dialogue with governments or donors concerning the types of indicators used in the national results frameworks, it is crucial to clarify beforehand the concepts underlying the terminology.

The European Union Results Framework was laid down in the Commission staff working document SWD(2015) 80 final "Launching the EU International Cooperation and Development Results Framework". This aimed at strengthening the capacity of the European Commission to monitor and report results, enhancing accountability, transparency and visibility of EU aid. Following the launch of the 2030 Agenda and the SDGs in 2015 and the new European Consensus on Development in 2017, the EU Results Framework was revised to align it with these key development policy frameworks. The updated Results Framework is described in the Commission staff working document SWD(2018) 444 final "A Revised EU International Cooperation and Development Results Framework in line with the Sustainable Development Goals of the 2030 Agenda for Sustainable Development and the New European Consensus on Development".

The new European Consensus on Development aligned EU development policies with the 2030 Agenda and the SDGs, integrating the previous EU 'Agenda for Change' (2011). It provides a common framework for development cooperation for the EU and its Member States.

The Consensus sets out that the EU and its Member States will integrate the 2030 Agenda and support the use of SDG indicators to measure development results at country level. In particular, SDG indicators can foster and facilitate harmonised reporting of results, including partner countries' results frameworks, thus supporting the efforts of the EU in boosting the statistical capacity of partner countries, including on the production and analysis of data to inform policy and decision-making.

Basing the EU Results Framework on the SDGs facilitates further progress towards a common approach across the EU and its Member States for measuring and communicating the results of development policies and interventions. It also facilitates common approaches for measuring and communicating results in Joint Programming. Moreover, the SDGs provide a better context to articulate EU efforts with those of other actors, including other international donors, thereby enhancing development effectiveness. Given that partner countries are gearing their national systems towards SDG implementation, the use of SDG indicators in the EU Results Framework also contributes to the general development effectiveness objective of making use of data produced by national systems to the greatest extent possible, including in the context of their own development strategies.

Overall, this approach enhances the role of the results framework as an essential element of the architecture contributing to effective implementation and consistent communication of the EU contribution to progress towards the SDGs in partner countries.

The revised EU Results Framework maintains the three-level structure of the first framework, organising it around the 17 SDGs. Level 1 continues to track development progress in partner countries: i.e., the medium/long term development impact achieved in partnership and collaboration with partner governments, donors and other development actors, including the private sector and civil society. Such progress is, by nature, slow and impacts reported at this level are not intended to directly assess the performance of EU international cooperation, but rather give the operational context in which EU external assistance is provided.

Level 2 focuses on development outcomes and outputs which EU funded interventions contributed to in collaboration with partner country governments and other funding providers. It is at this level that results, most relevant for internal decision-making, accountability, communication, and lesson learning are aggregated.

Level 3 focuses on policy priority mainstreaming as measured by budgetary commitments directed towards specific priorities (e.g., human development, gender, nutrition). Indicators on overall organisational performance previously included were not easily understandable and were already regularly reported on; they have therefore been omitted from the revised Results Framework.

Box B.3.2: Typology of indicators by the use made of them

A. Indicators used to describe events at country or regional level and which are useful for policy. They are able to depict the context of a sector and to measure its changes over time. This category includes: the EU Results Framework indicators, the SDGs, the World Bank International Development Association (IDA) Results Managements System etc.

B. Indicators used to monitor what is happening at programme/project level and to evaluate it. These indicators can usually be found in a logical framework for a programme or project and in budget support programmes. For programmes/projects, these will often be sector specific and may be tailored to the individual action.

C. Indicators used for reporting and accountability of countries and donors with respect to their commitments. These include aid effectiveness indicators. In principle, the SDG indicators could be seen as part of this group, but in practice they cannot be used to hold countries or donors accountable.

To find out more…

- European Consensus on Development (2017)
- European Commission: SWD(2018) 444 final A Revised EU International Cooperation and Development Results Framework in line with the Sustainable Development Goals of the 2030 Agenda for Sustainable Development and the New European Consensus on Development (2018)
- World Bank International Development Association: IDA Results Measurement System; IDA18 Results Measurement System Tier I database
- Independent Evaluation Group / World Bank: Designing a results framework for achieving results: a how-to guide (2012)
- United Nations Development Programme: Evaluation Guidelines (2021)
- OECD-DAC: DAC Network on Development Evaluation; Development co-operation results for the 2030 Agenda (2018); Toolkit for identifying, monitoring and evaluating the value added of triangular co-operation (2018)

B.3.3. Indicators and statistics in the European Commission development cycle

B.3.3.1 STATISTICS IN PROGRAMMING

European Commission development policies have undergone substantial update and refocusing in recent years and a major shift for the programming period 2021-2027. The new European Consensus on Development, adopted in 2017, aligned EU development policies with the 2030 Agenda for Sustainable Development and the Sustainable Development Goals, while also integrating the 2011 'Agenda for Change'.

With the adaptation of the European Green Deal, the European Union has affirmed its role as a global leader in climate action and towards sustainable societies and economies. The EU will:

- work with Africa to bring climate and environment issues to the centre of the mutual relations.
- set up a Green Agenda for the Western Balkans, mirroring the Green Deal.
- establish environment, energy and climate partnerships with the Eastern Partnership and Southern Neighbourhood.
- build Green Alliances with partner countries and regions in Latin America, the Caribbean, Asia and the Pacific.

Box B.3.3: The European Consensus on Development and reliable data for planning and programming

The European Consensus on Development from 2017 emphasises the EU's and its Member States' common commitment to "working better together". This includes improving effectiveness and impact through greater coordination and coherence. Joint Programming should be promoted and strengthened, while being kept voluntary, flexible, inclusive, and tailored to the country context. It should allow for the replacement of EU and Member States' programming documents with EU Joint Programming documents.

Partner country engagement, appropriation and ownership are essential for this process. Joint Programming should be led by the partner country's development strategy and aligned to the partner country's development priorities. National governments have the primary responsibility for implementing the 2030 Agenda. The EU and its Member States will provide support for comprehensive and inclusive planning in partner countries, rooted in national and sub-national development strategies, programmes and budgets.

Some of the fundamental aims will be to build the capacity of partner countries to implement the 2030 Agenda at local, regional and national levels. The EU and its Member States will support capacity building for nationally owned monitoring frameworks, quality data collection, disaggregation, and analysis. The EU and its Member States will support partner countries' capacity to formulate and implement inclusive national sustainable development policies and results frameworks as well as to increase accountability and responsiveness to citizens.

The EU and its Member States will boost the statistical capacity of partner countries, including through strengthened capacity for the production and analysis of data to inform policy and decision-making. These data should be disaggregated where possible by income, gender, age and other factors, and provide information on marginalised, vulnerable and hard-to-reach groups. This will also include investments in stronger statistical institutions at sub-national, national and regional level, and the use of new technologies and data sources. The EU and its Member States will encourage their partner countries to include the voices of marginalised communities in monitoring the SDGs and to promote concrete mechanisms to this end.

The EU and its Member States will integrate the 2030 Agenda and support the use of SDG indicators to measure development results at country level. In particular, SDGs indicators can foster and facilitate a common EU results-oriented approach that favours harmonised results reporting at partner country level, including partner-country-level results frameworks, where they exist.

The EU and its Member States will progressively adapt their reporting systems in the field of development cooperation to be consistent with the 2030 Agenda's follow-up processes and indicators. They will improve the quality and availability of data on their development cooperation activities, across the 2030 Agenda.

Source: The new European Consensus on Development: 'Our World, Our Dignity, Our Future' (2017)

B.3.3.2 GLOBAL EUROPE: NEIGHBOURHOOD, DEVELOPMENT AND INTERNATIONAL COOPERATION INSTRUMENT

The new 'Global Europe: Neighbourhood, Development and International Cooperation Instrument' (NDICI) gives particular priority to the countries most in need, particularly least developed countries, low-income countries, fragile or crisis-struck countries, supporting them to overcome long-term developmental challenges. NDICI – Global Europe will contribute to achieving the international commitments and objectives that the European Union has agreed to, in particular the 2030 Agenda and its Sustainable Development Goals and the Paris Agreement.

NDICI – Global Europe will be the EU's main financing tool for eradicating poverty and promoting sustainable development, prosperity, peace and stability over the programming period 2021-2027. It merges several previous external financing instruments under the EU budget, including the Development Cooperation Instrument, the European Neighbourhood Instrument, the Partnership Instrument, the Instrument for Stability and Peace, the European Instrument for Democracy and Human Rights and the European Fund for Sustainable Development. It unifies grants and guarantees, which will allow the EU to strategically promote public and private investment worldwide in support to sustainable development through the European Fund for Sustainable Development Plus (EFSD+). Investments will be backed by an External Action Guarantee, which will also cover the pre-accession countries. The EU will continue to work towards achieving the target of investing 0.7% of its collective Gross National Income (GNI) in official development assistance (ODA), and 0.2% to the least developed countries (LDC).

NDICI - Global Europe will increase the effectiveness and visibility of the EU's development cooperation actions, strengthen the policy coherence of the EU's development policy with other EU policies and give the EU flexibility to provide a faster response to new crises and challenges. Its place within the EU's Multiannual Financial Framework (MFF) 2021-2027 increases transparency and improves democratic scrutiny through the European Parliament, while also simplifying and modernising procedures and management. The new instrument will also vastly increase EU flexibility to react to changing circumstances and rapidly emerging crises.

NDICI – Global Europe operates through three key pillars:

- The geographic pillar will support and foster dialogue and cooperation with third countries and regions in the Neighbourhood, in Sub-Saharan Africa, in Asia and the Pacific, and in the Americas and the Caribbean; develop special strengthened partnerships and enhanced political cooperation with the European Neighbourhood, founded on cooperation, peace and stability and a shared commitment to the universal values of democracy, rule of law and respect for human rights, and aiming at deep and sustainable democracy and progressive socio-economic integration as well as people-to-people contacts; foster dialogue and cooperation with third countries. Each regional envelope will be adapted to the needs and priorities of the respective countries and region, which will reflect the EU's strategic priorities.
- The broad instrument will remove artificial barriers between previous instruments, reduce administrative burden and streamline the management structure. In line with the close interlinkages between the 17 Sustainable Development Goals, the ambition of the new integrated architecture is that individual actions will not be addressing just one separate issue but respond to several goals at the same time.
- The thematic pillar will protect, promote and advance democracy and rule of law, including accountability mechanisms, and human rights including gender equality and the protection of human rights defenders; support civil society organisations; further stability and peace and prevent conflict, thereby contributing to the protection of civilians; address other global challenges such as climate change, protection of biodiversity and the environment, as well as migration and forced displacement, health, education, empowering women and children, inclusive growth, decent work, social protection and food security.
- The (non-programmable) rapid-response pillar will allow the EU to rapidly and effectively intervene for conflict prevention and to respond to situations of crisis or instability, including those which may result from migratory flows and forced displacement and hybrid threats. It will help increase partner countries' resilience, including to natural and man-made disasters, linking of humanitarian aid and development action, as well as taking early action to address the EU's foreign policy needs and priorities

NDICI – Global Europe also includes a buffer reserved for emerging challenges and priorities and may raise additional financial resources from the private sector to support financing and investment operations in all its geographical areas, with special attention to least developed countries and countries experiencing fragility and conflict.

NDICI – Global Europe is delivered through direct management by the Commission (centrally and through the EU Delegations), as well as through indirect management by entities such as the EU Member States agencies or international organisations or partner countries. Financial instruments will be designed in partnership with the European Investment Bank, Member States' financial institutions or other European and international development financial institutions. The lead services involved in implementing the instrument are DG International Partnerships (DG INTPA), DG Neighbourhood and Enlargement Negotiations (DG NEAR) and the Service for Foreign Policy Instruments (FPI), in cooperation with the European External Actions Service (EEAS) and DG Trade (TRADE) and other line DGs, especially on external dimensions of internal policies like climate, energy, digital and education.

Information on the instrument is provided at DG INTPA's webpage on NDICI – Global Europe and in the facts featured on that page. Readers are invited to consult the web pages of DG INTPA, DG NEAR or the EEAS for more information.

Box B.3.4: Global Europe: Neighbourhood, Development and International Cooperation Instrument (NDICI) – Performance framework

Target: To support and foster dialogue and cooperation with third countries and regions in the Neighbourhood, in Sub-Saharan Africa, in Asia and the Pacific, and in the Americas and the Caribbean; to develop special strengthened partnerships and enhanced political cooperation with the European Neighbourhood, founded on cooperation, peace and stability and a shared commitment to the universal values of democracy, rule of law and respect for human rights, and aiming at deep and sustainable democracy and progressive socio-economic integration as well as people-to-people contacts.

Indicator	Dimension measured	Type	Source	Data availability
The Rule of Law score in relation to countries benefiting from Union assistance[(c)]	Guarantees of fundamental rights and values	Impact	World Bank Worldwide Governance Indicators	First data in 2022; estimated lag 1 year; annually
Proportion of population below the international poverty line[(c)]	Poverty eradication	Impact	SDG Global Database	First data in 2022; estimated lag 3 years; annually

Target: At global level, to protect, promote and advance democracy, and the rule of law, including accountability mechanisms, and human rights, including gender equality and the protection of human rights defenders, including in the most difficult circumstances and urgent situations, to support civil society organisations, to further stability and peace and prevent conflict, thereby contributing to the protection of civilians, to address other global challenges such as, climate change, protection of biodiversity and the environment, as well as migration and mobility.

Indicator	Dimension measured	Type	Source	Data availability
N. of women of reproductive age, adolescent girls, and children under 5 reached by nutrition programmes with Union support[(2)]	Human development – nutrition	Output	Commission's monitoring and reporting systems	First data in 2022; estimated lag 1 year; annually
N. of smallholders reached with Union supported interventions aimed to increase their sustainable production, access to markets and/or security of land[(2)]	Human development	Output	Commission's monitoring and reporting systems	First data in 2022; estimated lag 1 year; annually
N. of 1-year olds fully immunised with Union support[(2)]	Human development – health	Output	Commission's monitoring and reporting systems	First data in 2022; estimated lag 1 year; annually
N. of individuals with access to improved drinking water source and/or sanitation facilitation with Union support[(2)]	Human development – health	Result	Commission's monitoring and reporting systems	First data in 2022; estimated lag 1 year; annually
Number of students enrolled in education: (a) primary education (b) secondary education and number of people who have benefitted from institution or workplace-based VET/skills development interventions, supported by the Union[(2)]	Human development – education	Output	Commission's monitoring and reporting systems	First data in 2022; estimated lag 1 year; annually
N. of victims of human right violations directly benefitting from assistance funded by the Union(2)	Human rights	Output	Commission's monitoring and reporting systems	First data in 2022; estimated lag 1 year; annually
Proportion of Union funded cooperation promoting gender equality and women's empowerment(1)	Gender equality	Input	Commission's internal financial information management system	First data in 2022; estimated lag none; annually
Migrants, refugees and internally displaced people or individuals from host communities protected or assisted with Union support(2)	Migration	Output	Commission's monitoring and reporting systems	First data in 2022; estimated lag 1 year; annually
Number of SMEs applying sustainable consumption and production practices with Union support(2)	Healthy environment and climate change mitigation	Result	Commission's monitoring and reporting systems	First data in 2022; estimated lag 1 year; annually

Countries and cities with climate change and/or disaster risk reduction strategies with Union support(2)	Healthy environment and climate change mitigation	Result	Commission's monitoring and reporting systems	First data in 2022; estimated lag 1 year; annually
Greenhouse gas emissions avoided (kilotonnes of CO2 equivalent) with Union support(2)	Healthy environment and climate change mitigation	Result	Commission's monitoring and reporting systems	First data in 2022; estimated lag 1 year; annually
Area of marine, terrestrial and freshwater ecosystems protected and/or sustainably managed with Union support(2)	Healthy environment and climate change mitigation	Result	Commission's monitoring and reporting systems	First data in 2022; estimated lag 1 year; annually
Renewable energy generation capacity installed (MW) with Union support(2)	Healthy environment and climate change mitigation	Output	Commission's monitoring and reporting systems	First data in 2022; estimated lag 1 year; annually
Leverage of investments and multiplier effect achieved(1)	Inclusive growth, decent jobs and private sector engagement	Output	Commission's internal financial information management system	First data in 2022; estimated lag none; annually
Target: To respond rapidly to: situations of crisis, instability and conflict including those which may result from migratory flows and forced displacement and hybrid threats; resilience challenges, including natural and man-made disasters, and linking of humanitarian aid and development action; as well as the Union foreign policy needs and priorities.				
Indicator	**Dimension measured**	**Type**	**Source**	**Data availability**
Number of individuals directly benefiting from Union supported interventions that specifically aim to support civilian post-conflict, peace building or conflict prevention(2)	Conflict prevention, peace-building and crisis preparedness	Output	Commission's monitoring and reporting systems	First data in June 2022; estimated lag: 6 months; annually
Number of processes related to partner country practices on trade, investment and business, or promoting the external dimension of Union internal policies or Union interest, which have been influenced(2)	Union foreign policy	Result	Commission's monitoring and reporting systems	First data in June 2022; estimated lag: 6 months; annually
Number of Union funded initiatives supporting the implementation of political, economic and social reforms and joint agreements in partner countries(1)	Union foreign policy	Input	Commission's internal financial information management system	First data in June 2022; estimated lag: 6 months; annually

c Context indicators
1 Level 1 indicators in the EU Results Framework
2 Level 2 indicators in the EU Results Framework

Source: DG International Partnerships: Neighbourhood, Development and International Cooperation Instrument: Performance framework (2021)

Box B.3.5: The Global Europe – NDICI: Estimation of baselines and targets

Baselines and targets for Level 1 indicators in the EU Result Framework	The baselines for these indicators are the average values over 2014-2020. Step 1: The monitoring services of the relevant DGs of the Commission provide the available data on performance over the 2014-2020 MFF; Step 2: The Commission's relevant units adjust for changes in budget and priorities.
Baselines and targets for Level 2 indicators in the EU Result Framework	Since these indicators measure results achieved since the beginning of the MFF, at the beginning of the MFF nothing has been achieved yet and therefore the baselines are zero. Step 1: The monitoring services of the relevant DGs of the Commission provide the available data on performance over the 2014-2020 MFF; Step 2: The Commission's relevant units adjust for changes in budget and priorities. In some cases, only 3 years of data will be available, meaning that milestones and targets will have to be set with very limited information. Consequently, these milestones and targets will be conservative.
Baselines and targets context indicators	The baselines for these indicators are the values in 2020. Step 1: The monitoring services of the relevant DGs of the Commission use the historical data to project future values using linear interpolation; Step 2: The Commission's relevant units validate. These indicators are context indicators, and the results they measure are in no way attributable to our actions. Consequently, targets will be estimated by using past values to project into the future, assuming past trends will continue in the future. Linear projections will be used unless the data indicates that a nonlinear approach would be more appropriate.

Source: DG International Partnerships: Neighbourhood, Development and International Cooperation Instrument: Performance framework (2021)

B.3.3.3 STATISTICS AND BUDGET SUPPORT

Budget support is an important instrument in EU's comprehensive development policy towards partner countries. EU budget support is not a blank cheque, nor is it provided to every country. "Underlying principles" matter and policy dialogue is a key part of the package.

Moreover, eligibility criteria have to be met before and during the programme and conditions need to be fulfilled before payments are made. This ensures that resources are used for their intended purposes, mitigates risks, and creates incentives for improved performance and results. It also creates incentives for partner countries to improve their governments systems.

The European Commission only provides budget support to countries that meet the following eligibility conditions:

- A well-defined national or sectoral development or reform policy and strategy is in place;
- A stability-oriented macroeconomic framework is in place;
- A credible and relevant programme to improve public financial management is in place;
- Transparency and oversight of the budget information must be made publicly available.

Budget support is only disbursed when the eligibility criteria and additional agreed conditions on results are met. Compliance with the eligibility criteria and fulfilment of the agreed conditions is crucial to assure the appropriate use of resources, reduce risks and create incentives for improved performance. Where the European Commission notes that progress is insufficient, budget support tranches are withheld until credible reassurances or measures have been established.

The European Commission Communication 'The future approach to EU budget support to third countries' (2011) confirms that EU budget support should continue to be predictable, to emphasise nationally owned development strategies and to use performance related tranches. The Commission remains committed to results-based budget support operations. It will further strengthen progress assessment and monitoring of outcomes, including by using process and output indicators.

This initial framework was later completed by the EU's commitment to the UN 2030 Agenda for Sustainable Development (2015) and the Addis Ababa Action Agenda (2015). The New European Consensus on Development (2017), which implements the 2030 Agenda in the EU, reiterates the importance of a coordinated approach to budget support and insists on the need for a rights-based approach, to make sure no one is left behind.

The EU will continue to apply a dynamic approach to eligibility criteria, focusing on progress in the implementation of credible and relevant reform strategies. The European Commission intends to improve its eligibility criteria and assessment of these as well as the allocation of funds.

Budget support should continue to involve a combination of base tranches linked to eligibility, and performance tranches linked to progress against indicators in addition to eligibility criteria. The indicators should be drawn from the partner country's national or sector development policy and should contain a mix of process, output, and outcome indicators.

Indicators and targets should be reviewed as part of each annual review and may be adapted in the light of lessons learned.

Budget support relies on conditionality and policy dialogue; thus baseline information is needed to start the process. As budget support is focused on development results, information to measure the performance of budget support at general and at sector policy level is needed. Relevant and reliable performance and output indicators, based on statistics, are necessary to verify the extent to which variable budget support tranches can be disbursed.

The partner country should have a credible and functioning system for monitoring and evaluation of results. If weaknesses are identified in this system, actions should be agreed to strengthen it. The European Commission pays particular attention to:

- The institutional setup of the monitoring and results evaluation system;
- The existing monitoring and evaluation plan linked to development objectives and key processes;
- Quality, regularity and reliability of data. In particular, this covers official statistics, information systems, indicators and reporting documents;
- Capacity development to support monitoring and evaluation functions.

The European Commission systematically assesses the need for capacity development, in order to enhance the capacity of partner country governments to implement policies and deliver services to final beneficiaries and to promote active engagement of domestic stakeholders. In particular, the European Commission assesses the needs to strengthen the national statistical system and its capacity to provide reliable statistics for required policy formulation, monitoring and performance assessment. The support to capacity development is based on demand, linked to clear outputs, and through harmonised and aligned initiatives.

B.3.3.4 STATISTICS AND IDENTIFICATION

The use of indicators is also crucial for the success of a project or programme identification. Compared to the set of indicators used during programming, the indicators chosen at this stage will tend to present a closer definition of the particularities of a sector.

The choice of the set of indicators will provide measurements of the situation in the sector where the cooperation intervention is to be designed. The main aim of these measurements will be to identify what are the needs, the strengths and weaknesses existing in the sector and will facilitate the choice of activities and targets constituting the project.

In the case of budget support programmes, it is important not to confuse the indicators that will furnish this crucial information on needs, strengths, and weaknesses and those that will be used for the disbursement of the variable tranches. Usually, the disbursement indicators will be a limited subset of the sector indicators that will focus on a few main issues which are considered crucial to assess the progress of the government towards the achievement of the programme's objectives.

The process for reaching the decision on whether to provide budget support involves:

- assessment of a country's commitment to the fundamental values of human rights, democracy, and rule of law. The assessment will be done within the risk management framework (political risk category) during the identification phase and subsequently monitored during the formulation and implementation phases, using the risk framework;
- assessment of eligibility against the four eligibility criteria (well-defined national/sectoral development strategy; stability-oriented macroeconomic framework; credible and relevant programme to improve public financial management; transparency and oversight of the budget). This will be done for all budget support contracts during the identification and formulation phases. It will also be done during implementation, in addition to variable tranche performance.
- assessment of the risks and whether these are likely to be outweighed by the mitigating measures and expected benefits during the identification, formulation, and implementation phases.

Decisions on ***how much budget support*** will be provided will be based on a broad qualitative assessment of the following needs and performance criteria:

- Financing needs of the partner country, assessed on the basis of its medium-term fiscal framework and the national/sector development strategies;
- Commitment of the partner country to allocate national budget resources in line with development strategy and objectives;
- Effectiveness, value for money and impact of the specific added value that budget support will bring in achieving the partner country's policy objectives;
- Track record and absorption capacity of past disbursements, and how effectively agreed objectives were achieved with budget support operations;
- Result orientation in the partner country's development strategy, including a monitoring system.

B.3.3.5 STATISTICS AND FORMULATION / IMPLEMENTATION

The same set of indicators used to support the identification of a project or programme will usually be useful for the formulation phase. However, given the greater knowledge of the field of intervention at this stage, new indicators are often added to the set as new needs for information on specific issues are defined. This final set of indicators constitutes a project's logical framework and will be used later on for monitoring of project implementation. For budget support programmes, some issues need to be taken into account:

Formulation: All budget support contract Action Fiches should follow the same format, covering the following main sections:

- Rationale, objectives and expected benefits of the budget support programme, which constitute the key lines of the strategic framework;
- Assessment of country context and budget support eligibility, which summarize the main issues and results of the assessment of the four eligibility criteria;
- Risk Management, which covers the main issues identified in the risk management framework, focusing on a description of the major risks and mitigating measures;
- Design of the programme, which covers the implementation issues, including the expected benefits and results, total budget and indicative calendar for disbursements, stakeholders and donor coordination, performance monitoring, criteria for disbursement, complementary measures (in particular for capacity development, evaluation and audit, communication and visibility).

Implementation: Regular monitoring and dialogue are key elements of all budget support operations. Promoting domestic ownership and accountability, strengthening teamwork within EU Delegations and across all budget support providers, and paying attention to appropriate communication and visibility activities will all be important.

At the end of a budget support programme, a final report needs to be formulated. These final programme reviews will highlight the initial objectives of the programme, progress and results achieved during implementation, as well as lessons learnt. These reviews are not formal evaluations but aim at providing input for future budget support operations and at improving the communication and visibility of results.

B.3.3.6 STATISTICS AND EVALUATION

Four sets of indicators correspond to four specific stages of the evaluation process:

- Context indicators provide information about the changes in the country under evaluation, the location and the assistance provided.
- Programme indicators detail the resources, implementation, results and if possible, the impacts of an ongoing activity.
- Evaluation indicators, when examined together with the evaluation criteria, enable the evaluator to formulate a judgement on the programme's relevance, coherence, efficiency, and effectiveness and to support answers to evaluation questions.
- Monitoring indicators are included in the monitoring system of programmes and sometimes used by evaluators to assess the implementation of programmes.

An indicator can belong to several of these indicator sets and be used in a variety of situations. For example, a socioeconomic indicator may also be appropriate as a programme impact indicator.

The European Commission country evaluations make use of context indicators. These indicators are often designed to highlight the specificities of a local context, however without enabling the evaluator to make a comparison between countries or get a global and normative view of the country's situation. In certain cases and countries, the emphasis may be put on particular sectors or issues (e.g., poverty analysis, conflict analysis). Context indicators include:

- Economic indicators: GDP, growth, debt, balance of payments;
- Social indicators: population, unemployment, educational level, health;
- Indicators of services provided to the population: education, health, drinking water, electrification;
- Others: indicators for the analysis of poverty.

The main evaluation indicators are those that specify the data needed to make a judgement based on specific judgement criteria. An indicator can be constructed specifically for an evaluation or measured through a survey. It may also be drawn from monitoring databases, a performance assessment framework, or statistical sources.

A qualitative indicator measures the target group's opinion on a specific subject, e.g., how parents perceive their children's possibility of attending a primary school class with a qualified teacher (very good/good/average/poor/very poor). A quantitative indicator gives information on an issue that can be measured or counted, e.g., the number of qualified and experienced teachers. More advanced indicators (ratios, rates) may be calculated on the basis of basic quantitative indicators directly resulting from the counting process, e.g., the educational cost per pupil or the number of qualified experienced teachers per thousand children of primary-school age. If there are no indicators available that directly measure what is needed for the evaluation, proxy indicators may be used; these are indicators that measure related issues rather than directly the issue evaluated but can still give general information on trends and tendencies.

Indicators, as mentioned before, may belong to different categories: inputs, outputs, results or impacts. When an evaluation question centres on an intended result or impact, it is worth checking whether this result or impact has been subject to performance monitoring. In such cases, the evaluation uses the corresponding indicators and data, which generally should also provide baseline data. However, performance monitoring data do not cover cross-cutting issues, sustainability factors, unintended effects, evolving needs or problems, coherence etc.

Performance indicators and targets are often expected to be SMART: Specific; Measurable; Attainable; Realistic; Timely.

Indicators used to evaluate an effect are not in themselves a measurement or evidence of that effect. The indicator only informs on changes, which may either result from the intervention (effect) or from other causes. This is in particular a challenge for budget support programmes.

Budget support evaluations should be carried out every five to seven years, together with the other donors that provide

budget support to the partner country to be evaluated. The budget support evaluation should use the methodological approach developed by the OECD/DAC Steering Group for budget support evaluations. Donors need to work closely with evaluation departments of governments throughout the process leading to and during evaluations. The Technical and Administrative Provisions of Financing Agreements and Memoranda of Understanding should include provisions on when and how budget support evaluations should take place. In particular, they should ensure that proper monitoring and data collection systems (including household and other required surveys) are in place.

B.3.4. Eurostat database

The Eurostat website and database provide extensive harmonised data about the EU, the Eurozone, and EU Member States and regions. For many indicators, data are also provided for EFTA countries, as well as for EU candidate countries and potential candidates. Generally, the data for the candidate countries and potential candidates have been reported within the same data collection schemes as the data for the EU Member States and have undergone the same validation. Some data are also provided for the USA, Canada, Japan and other partner countries.

For the candidate countries and potential candidates, Eurostat carries out a dedicated annual data collection on a range of additional indicators. These data supplement the data collected through Eurostat's regular data collections. These data are available for Commission use, including the Annual Statistical Annexes of the Annual Progress Reports on the candidate countries and potential candidates issued by DG European Neighbourhood and Enlargement Negotiations (DG NEAR).

The Eurostat website also provides data on the European Neighbourhood Policy (ENP) countries in the ENP-East database and the ENP-South database. These data can also be accessed through the Data Navigation Tree on the Eurostat database, under 'Detailed datasets' – 'General and regional statistics' – 'Non EU countries'.

Data for the ENP countries are supplied by and under the responsibility of the national statistical authorities in the respective countries or territories. Data from other sources are very limited and clearly identified; the ENP data have not undergone the same validation process as the other data in the Eurostat database.

More information on Eurostat's cooperation with different groups of countries and different statistical capacity development tools can be found on Eurostat's International cooperation webpage.

To find out more…

about Eurostat international cooperation

- International cooperation - Overview
- Candidate countries and potential candidates
- European Neighbourhood Policy (ENP) countries
- ENP-East countries; Statistics Through Eastern Partnership (STEP)
- ENP-South countries
- MEDSTAT
- Pan African Statistics (PAS) programme

about Eurostat data for European Neighbourhood Policy (ENP) countries

- ENP-East database
- ENP-South database
- Eurostat database

To find out more…

about international frameworks:

- UN Resolution 70/1 (2015) "Transforming our world: the 2030 Agenda for Sustainable Development"
- The Sustainable Development Goals
- The Inter-Agency and Expert Group on Sustainable Development Goal Indicators (IAEG-SDGs)
- Paris Declaration on Aid Effectiveness (2005) and the Accra Agenda for Action (2008)
- PARIS21: Dakar Declaration on the Development of Statistics (2009)
- Busan High Level Forum on Aid Effectiveness: Busan Action Plan for Statistics (2011)
- High-level Group for Partnership, Coordination and Capacity-Building for statistics for the 2030 Agenda for Sustainable Development (HLG-PCCB)
- United Nations World Data Forum (UN WDF)
- Cape Town Global Action Plan for Sustainable Development Data (2017)

about European Commission development policies:

- European Commission Communication COM(2011) 638: The future approach to EU budget support to third countries
- Shared vision, common actions: a stronger Europe. Global strategy for the European Union's foreign and security policy (2016)
- New European Consensus on Development (2017)
- EU as a global leader: the European Green Deal (factsheet, December 2019)
- DG International Partnerships: Climate, environment and energy
- Proposal for a Regulation of the European Parliament and of the Council establishing the Neighbourhood, Development and International Cooperation Instrument (COM(2018) 460 final)
- Partnership between African, Caribbean and Pacific states and the EU: the Cotonou Agreement (2000; extended to 30 November 2021); new Partnership Agreement between the EU and the Organisation of African, Caribbean and Pacific States (OACPS) (agreed on 15 April 2021)

about procedures for European Union development financing instruments:

- Commission Staff Working Document SWD(2018) 444: A Revised EU International Cooperation and Development Results Framework in line with the Sustainable Development Goals of the 2030 Agenda for Sustainable Development and the New European Consensus on Development
- European Commission: Better Regulation Toolbox chapter 3 (which contains, among other things, Tool #35 Developing countries
- European Commission – DG International Partnerships: Budget Support Guidelines (2017)
- European Commission – DG International Partnerships: Budget support
- European Commission – DG International Partnerships: Budget support – Trends and results 2023
- Commission Staff Working Document SWD(2015) 198: Collect more – Spend better: Achieving development in an inclusive and sustainable way
- European Commission – DG International Partnerships: Aid transparency; Strategic evaluations – Assessing the quality of EU development aid; Project and programme evaluations

about the Global Europe - Neighbourhood, Development and International Cooperation Instrument:

- Regulation (EU) 2021/947 of the European Parliament and of the Council of 9 June 2021 establishing the Neighbourhood, Development and International Cooperation Instrument – Global Europe
- Commission Staff Working Document SWD(2018) 337 Impact assessment accompanying the document Proposal for a Regulation of the European Parliament and of the Council establishing the Neighbourhood, Development and International Cooperation Instrument
- DG International Partnerships: Global Europe: Neighbourhood, Development and International Cooperation Instrument
- European Fund for Sustainable Development Plus (EFSD+)
- DG International Partnerships: Factsheet - Global Europe: Neighbourhood, Development and International Cooperation Instrument (2022)
- DG International Partnerships: Neighbourhood, Development and International Cooperation Instrument: Performance framework (2021)
- DG International Partnerships: Neighbourhood, Development and International Cooperation Instrument – Global Europe - Performance

B.4 Statistics across policy sectors

B.4. Statistics across policy sectors

The chapter in brief

This chapter presents some international indicators that have cross-sectional coverage and are relevant to the European Commission development aid process, in particular the SDGs indicators and indicators to assess the implementation of a Poverty Reduction Strategy. Examples of project or programme indicators are presented in the specific sector chapters of this Guide.

Finally, the chapter describes the links between the European Commission's defined policy sectors and statistical activities.

B.4.1. Sustainable Development Goals indicators

B.4.1.1 THE SUSTAINABLE DEVELOPMENT GOALS, THEIR TARGETS, AND INDICATORS

The eight Millennium Development Goals (MDGs) set specific targets on poverty alleviation, education, gender equality, child and maternal health, environmental stability, HIV/AIDS reduction, and a 'Global Partnership for Development.' By 2015, substantial progress had been made towards achieving the MDGs; global poverty had continued to decline, more children than ever were attending primary school, child deaths had dropped dramatically, access to safe drinking water had been greatly expanded, and targeted investments in fighting malaria, AIDS and tuberculosis had saved millions of lives.

However, the world community was committed to continue the efforts to achieve a world of prosperity, equity, freedom, dignity, and peace for all. The 17 Sustainable Development Goals (SDGs) are to be achieved by 2030. These goals are broken down into 169 specific targets. To measure the progress towards attaining these targets, the Inter-Agency and Expert Group on Sustainable Development Goal Indicators (IAEG-SDGs) has developed a framework of SDG indicators, which was adopted by the UN Statistical Commission in its meeting in March 2016. There are currently 231 unique SDG indicators. However, 12 indicators repeat under two or three different targets; therefore, the global monitoring framework lists 247 indicators.

The follow-up and review of the progress towards the SDGs is informed by an annual progress report prepared by the United Nations Secretary-General in cooperation with the United Nations system, based on this global indicator framework, data produced by national statistical systems and information collected at the regional level. In July 2016, the first annual Sustainable Development Progress Report was published by the United Nations, based on the SDGs indicators. Updated and further expanded issues of the SDG progress report have been published annually ever since.

Also in 2016, the UN Statistics Division launched the SDG Global Database, which provides the data compiled for the annual SDG progress report. The SDG indicators database also provides detailed metadata for each SDG indicator, including definition, calculation methods, data sources, responsible custodian institution (mostly UN organisations) and other methodological information. An 'E-Handbook on Sustainable Development Goals Indicators' has also been added, enabling national statisticians to monitor progress in the implementation of the SDGs based on data produced by national statistical systems, focusing on key aspects such as concepts, definition, sources and calculations that are essential for measuring the SDGs indicators.

Providing an example of this monitoring framework, the box below shows the relationship between Sustainable Development Goal 1 'No poverty', its associated targets and the indicators used to measure progress toward these targets. This structure is the same for each of the SDGs. The entire framework is presented on the UN Statistics Division website dedicated to the SDGs indicators.

Box B.4.1: Sustainable Development Goals, targets and indicators (example)

Sustainable Development Goal 1: End poverty in all its forms everywhere

Targets		Indicators	
1.1	By 2030, eradicate extreme poverty for all people everywhere, currently measured as people living on less than $1.25 a day	1.1.1	Proportion of the population living below the international poverty line by sex, age, employment status and geographic location (urban/rural)
1.2	By 2030, reduce at least by half the proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions	1.2.1	Proportion of population living below the national poverty line, by sex and age
		1.2.2	Proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions
1.3	Implement nationally appropriate social protection systems and measures for all, including floors, and by 2030 achieve substantial coverage of the poor and the vulnerable	1.3.1	Proportion of population covered by social protection floors/systems, by sex, distinguishing children, unemployed persons, older persons, persons with disabilities, pregnant women, newborns, work-injury victims and the poor and the vulnerable
1.4	By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance	1.4.1	Proportion of population living in households with access to basic services
		1.4.2	Proportion of total adult population with secure tenure rights to land, (a) with legally recognized documentation, and (b) who perceive their rights to land as secure, by sex and type of tenure
1.5	By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters	1.5.1	Number of deaths, missing persons and directly affected persons attributed to disasters per 100,000 population
		1.5.2	Direct economic loss attributed to disasters in relation to global gross domestic product (GDP)
		1.5.3	Number of countries that adopt and implement national disaster risk reduction strategies in line with the Sendai Framework for Disaster Risk Reduction 2015–2030
		1.5.4	Proportion of local governments that adopt and implement local disaster risk reduction strategies in line with national disaster risk reduction strategies
1.a	Ensure significant mobilization of resources from a variety of sources, including through enhanced development cooperation, in order to provide adequate and predictable means for developing countries, in particular least developed countries, to implement programmes and policies to end poverty in all its dimensions	1.a.1	Total official development assistance grants from all donors that focus on poverty reduction as a share of the recipient country's gross national income
		1.a.2	Proportion of total government spending on essential services (education, health and social protection)
1.b	Create sound policy frameworks at the national, regional and international levels, based on pro-poor and gender-sensitive development strategies, to support accelerated investment in poverty eradication actions	1.b.1	Pro-poor public social spending

The 2030 Agenda for Sustainable Development requires each country to produce a large number of statistics-based indicators, the frequency of data depending on the indicator and the country's level of development. The data are intended for use as a development map to illustrate how countries, regions and the world as a whole are progressing towards attaining the SDGs.

Although the previous MDGs indicators stimulated demand and coordinated international support for sustainable national statistical capacity development, they also led to debates about the quantity and quality of the data and associated metadata. These questions fundamentally centred on data availability, comparability, and national ownership of the indicators.

The IAEG-SDGs addressed a number of these issues in its work, leading to the global monitoring framework and its indicators. However, this continuous process involves further development and critical review of these indicators, as well as the definition and implementation of work plans. The IAEG-SDGs is currently preparing a comprehensive round of review of the global SDG indicators to be adopted in 2025.

In March 2015, the United Nations Statistical Commission created the 'High-level Group for Partnership, Coordination and Capacity-Building for statistics for the 2030 Agenda for Sustainable Development' (HLG-PCCB), aiming to establish a global partnership for sustainable development data. The HLG-PCCB provides strategic leadership for the SDG implementation process as it concerns statistical monitoring and reporting.

Following the recommendations in the report 'A World That Counts', presented in November 2014 by the United Nations Secretary-General's Independent Expert and Advisory Group on Data Revolution for Sustainable Development, the UN Statistical Commission agreed that a United Nations World Data Forum on Sustainable Development Data (UN World Data Forum) would be the suitable platform for intensifying cooperation with various professional groups, such as information technology, geospatial information managers, data scientists, and users, as well as civil society stakeholders.

The 'Cape Town Global Action Plan for Sustainable Development Data' (CTGAP) was launched at the first UN World Data Forum in Cape Town, South Africa, in January 2017. The implementation of the CTGAP addresses gaps in national statistics and statistical coordination identified in response to the 2030 Agenda. It is essential that such gaps are addressed in order to better enable the use of country-generated statistics in the calculation of global SDGs indicators. The goal is to strengthen the national statistical systems so that they can be most responsive to statistical needs to achieve the 2030 Agenda and beyond.

The CTGAP proposes six strategic areas, each associated with several objectives and related implementation actions:

Strategic Area 1: Coordination and strategic leadership on data for sustainable development.

Strategic Area 2: Innovation and modernisation of national statistical systems.

Strategic Area 3: Strengthening of basic statistical activities and programmes, with particular focus on addressing the monitoring needs of the 2030 Agenda.

Strategic Area 4: Dissemination and use of sustainable development data.

Strategic Area 5: Multi-stakeholder partnerships for sustainable development data.

Strategic Area 6: Mobilize resources and coordinate efforts for statistical capacity building.

The implementation of the CTGAP is supported by the Dubai Declaration, which was announced at the UN World Data Forum in Dubai in 2018. The Dubai Declaration calls for the establishment of an innovative funding mechanism open to all stakeholders aiming to mobilise both domestic and international funds, and to activate partnerships and funding opportunities to strengthen the capacity of national data and statistical systems.

The box below shows how an SDG indicator is developed based on existing statistics.

Box B.4.2: Building a statistical indicator of poverty

'No poverty' is the first of the Sustainable Development Goals (SDGs); more specifically, it is defined as "By 2030, eradicate extreme poverty for all people everywhere, currently measured as people living on less than $1.25 a day". To measure progress towards this first target, SDG indicator 1.1 is the 'poverty headcount ratio', which is defined as:

'The proportion of the national population living in households with per-capita consumption or income that is below the international poverty line of USD 1.25. It is calculated by dividing the number of persons living in households below the poverty line by the total number of persons.'

Data on household income, consumption and expenditure are generally collected through household budget surveys or other household surveys (LFS, HIES, LSMS, Integrated household surveys etc.). National statistical offices, sometimes in conjunction with other national or international agencies, usually undertake such surveys, typically every three to five years in partner countries.

Household income may be converted into equivalised income, i.e. income per adult equivalent. This can be calculated for different types of households (e.g., rural or urban, by gender of the head of the household etc.) Equivalised income can also be used to define national 'poverty lines', the level of income under which the household is considered as poor.

When using statistical data that originates from different surveys, attention must be paid to the definitions of income, for instance, whether income in kind is included or not. At country level, comparisons over time may be affected e.g., by changes in survey types or data collection methods.

The use of purchasing power parity (PPP) ensures that differences in price levels across countries are taken into account. The PPP is computed on the basis of price data from across the world; for the 2011 PPPs, prices were collected across 199 countries. As differences in the cost of living across the world evolve, the global poverty line has to be periodically updated. The responsibility for determining a particular year's PPP rests with the International Comparison Program (ICP), an independent statistical program.

A continuously debated issue remains the consistency between data and indicators published by the countries themselves on the one hand and indicators published by international organisations on the other hand. Such indicators in international databases/publications may result from conversion or transformation of national data in order to comply with international definitions (and thus increase comparability across countries), or they may be estimated for other reasons. The 'countryData' database, published by the UN Statistics Division, provides concise comparisons between national and international estimates of development indicators.

Part C discusses whether and how to provide European Commission support in order to improve the national data required for the SDG indicators and other indicators. SDGs indicators are discussed in chapter D.10.

To find out more…

- United Nations: Sustainable Development Goals; The Sustainable Development Goals Report 2023: Special Edition
- United Nations Statistics Division: SDG indicators website; official list of SDG indicators; SDG Global Database; E-Handbook on SDG indicators; countryData database
- United Nations Secretary-General's High-Level Panel on Global Sustainability (GSP): 'Resilient People, Resilient Planet: A Future Worth Choosing' (2012)
- UN system Task Team: Realizing the future we want for all (2012)
- UN Secretary-General's Independent Expert Advisory Group on a Data Revolution for Sustainable Development (IEAG): A World That Counts: Mobilising The Data Revolution for Sustainable Development (2014)
- High-level Group for Partnership, Coordination and Capacity-Building for statistics for the 2030 Agenda for Sustainable Development (HLG-PCCB)
- UN World Data Forum
- Cape Town Global Action Plan for Sustainable Development Data (CTGAP) (2017)
- Dubai Declaration (2018)
- United Nations' Sustainable Development Solutions Network

B.4.1.2 GDP AND BEYOND – MEASURING PROGRESS, WELL-BEING, AND SUSTAINABLE DEVELOPMENT

The Gross Domestic Product (GDP) is the best-known measure of macro-economic activity. GDP aggregates the value added of all money-based economic activities. It is based on a clear methodology that allows comparisons to be made over time and between countries and regions. GDP has also come to be regarded as an indicator for overall social development and general progress. However, there are growing demands to measure progress, well-being, and sustainable development in a more meaningful way. The definition of GDP implies clear limitations on its use as a measure of well-being and of economic, environmental, and social sustainability. The need to develop better data and indicators has been the focus of several international initiatives.

In 2008, the French government set up the 'Commission on the measurement of economic performance and social progress', also known as the 'Stiglitz-Sen-Fitoussi Commission'. Its aims were to identify the limits of GDP as an indicator of economic performance and social progress, to consider what additional information might be required for producing more relevant indicators of social progress, and to assess the feasibility of alternative measurement tools.

In 2009, the 'Stiglitz-Sen-Fitoussi Commission' Report was published, presenting 12 recommendations on how to better measure economic performance, societal well-being, and sustainability. The report was explicit on the need to look beyond factors of production to better measure economic performance and social progress in the context of sustainability. It suggested new avenues for better measurement in three main areas:

- Economic performance where improvements in GDP accounting are needed;
- Societal well-being (quality of life, including subjective measures of well-being);
- Sustainability and the environment.

The European Commission's Communication 'GDP and beyond — Measuring progress in a changing world' in 2009 aimed at developing more inclusive indicators that provide a more reliable knowledge base for better public debate and policymaking. It pointed to the need to improve, adjust and complement GDP with indicators that concisely incorporate social and environmental achievements (e.g., improved social cohesion, accessibility and affordability of basic goods and services, education, public health and air quality) and setbacks (e.g., increasing poverty, more crime, depleting natural resources). It proposed five priority actions to further develop environmental and social indicators and to report more accurately on distribution and inequalities:

Action 1: Complement GDP with environmental and social indicators (a comprehensive environmental index, quality of life and wellbeing).

Action 2: Provide near real-time information for decision-making (timelier environmental and social indicators).

Action 3: Report more accurately on distribution and inequalities.

Action 4: Develop a European sustainable development scoreboard.

Action 5: Extend national accounts to environmental and social issues.

To answer the challenges to official statistics presented by these two initiatives, the European Statistical System launched a 'Sponsorship Group'. This Sponsorship Group addressed statistical gaps, making concrete proposals on how to implement the recommendations of the 'Stiglitz-Sen-Fitoussi Commission' report and the 'GDP and Beyond' Communication. Its mandate was mainly to prioritise actions with the aim of producing adequate indicators rather than proposing an additional conceptual framework. The work

focused on making better use of and improving existing statistics with a view to providing the most appropriate indicators. Its report 'Measuring Progress, Well-being and Sustainable Development' was adopted the European Statistical System Committee in November 2011. This report identified more than 50 concrete actions for improving and developing European statistics over the coming years. The priority areas were:

- Household perspective and distributional aspects of income, consumption and wealth;
- Multidimensional measurement of the quality of life;
- Environmental sustainability.

The Sponsorship Group concluded that, for comparison purposes, core instruments are one important way of building harmonisation, and these should be developed. These should be defined in close cooperation with international partners.

This development work is continued through several international initiatives. The OECD's 'Better Life Initiative' and work programme on 'Measuring Well-Being and Progress' helps to understand what drives well-being of people and nations and what needs to be done to achieve greater progress for all. For well-being measures to start making a real difference to people's lives, they have to be explicitly brought into the policy-making process, requiring bridging of the gap between well-being metrics and policy intervention. The measuring well-being agenda calls for new and improved statistical measures, aimed at filling the gap between standard macroeconomic statistics that sometimes are used as proxies of people's welfare and indicators that have a more direct bearing on people's life.

The World Bank has released the report 'The Changing Wealth of Nations 2018: Building a Sustainable Future', presenting wealth accounts that allow countries to take stock of their assets to monitor the sustainability of development. The publication covers national wealth as the sum of produced capital, 19 types of natural capital, net foreign assets, and human capital overall as well as by gender and type of employment. New data substantially improve estimates of natural capital, and, for the first time, human capital is measured by using household surveys to estimate lifetime earnings.

The United Nations Environment Programme's (UNEP) 'Inclusive Wealth Report' (IWR) evaluates the capacities and performance of nations around the world to measure sustainability of the economy and the wellbeing of their people. The existing statistical systems in the countries are using the System of Environmental Economic Accounting, which is geared to measure flow-income. The flow would critically depend upon the health and resilience of capital assets like manufactured, human and natural capital. A country's inclusive wealth is the social value (not dollar price) of all its capital assets, including natural capital, human capital and produced capital.

To find out more…

About measuring growth, well-being and sustainable development, beyond the Gross Domestic Product

- International Commission on Measurement of Economic Performance and Social Progress (Prof. J. Stiglitz, Prof. A. Sen, Prof. J.P. Fitoussi; 2009)
- European Commission Communication COM(2009) 433: GDP and beyond – Measuring progress in a changing world (2009)
- European Statistical System: 'Measuring Progress, Well-being and Sustainable Development' website (2011)
- Eurostat: Quality of life statistics - overview
- European Commission, DG Environment: Beyond GDP
- OECD: Better Life initiative: Measuring Well-being and Progress
- World Bank: Changing Wealth of Nations (2018)
- United Nations Environment Programme (UNEP): Inclusive Wealth (2018)
- United Nations: System of Environmental Economic Accounting

B.4.2. Indicators for poverty reduction strategies

The World Bank and the IMF introduced the Poverty Reduction Strategy (PRS) approach in the context of their joint Initiative for Heavily Indebted Poor Countries (HIPC). The analysis is structured to promote country policies and activities that can meet the overall country economic and social goals. The approach has also been a cornerstone for IMF concessional financing and the Policy Support Instrument (PSI), the non-financing instrument for low-income countries.

Following the completion of the HIPC process, the content and process of PRS documentation changed. Most countries eligible for concessional financing were no longer required to produce HIPC-related PRS documentation to qualify for debt relief. In parallel, countries increasingly produced PRS documentation for their own domestic purposes on timelines determined by national needs. Reflecting these developments, the World Bank delinked its concessional financial support from the PRS process.

The new PRS approach is more flexible and streamlined, with a focus on macro-relevant aspects of the PRS. It is based on an Economic Development Document (EDD) that can take the form of an existing national development plan or strategy document on the country's PRS or a newly prepared document on the PRS. Minimum standards apply to the content of the EDD and good practice guidelines are expected to be followed, while taking into consideration specific country circumstances.

Indicators are required at each level of the PRS analysis. The indicators of human development and poverty reduction should be, at the levels of objectives and development outcomes, similar or identical to SDGs indicators as they serve the same purposes. At the action / policy level, indicators are often specified in less detail in the PRS itself, because individual activities will often be designed subsequent to the adoption of the PRS.

While PRSs and EDDs can require diverse data, commonly used indicators are:

- economic statistics (macroeconomic monitoring): two key national accounts aggregates, i.e., Gross National Income (GNI), GDP; consumer price index (inflation monitoring); public finance statistics (budget balance, public debt); balance of payments;
- demographic statistics: enumeration of population, its geographical distribution, its distribution by age and sex, mortality (especially infant mortality) by age and sex, and birth rates;
- statistics on household living conditions: income and expenditure, consumption, household equipment, employment;
- statistics on education: population of school age, school attendance, adult literacy, diplomas delivered, teachers, schools and their equipment;
- statistics on health: population morbidity, access to healthcare, staff, and health infrastructures.

Although PRSs and EDDs base their indicators on existing data sources where possible, there is an explicit recognition that PRS implementation may require improvement of the statistical quality and / or the range of available statistics.

A Performance Assessment Framework (PAF) is the core tool for the joint assessment by government and development partners of implementation of the national strategy and reform programme. The PAF is a government-owned document that prioritises reform measures and agreed targets in priority sectors within the national strategy. It provides a concise and verifiable set of indicators that is regularly revised in line with progress. Most PRSs and EDDs have an associated PAF.

The PAF should contribute to national capacities in planning, implementing, monitoring and evaluating its programmes. The long-term vision is for ministries and agencies to produce their own quantified and verifiable input, output and outcome indicators as a part of their annual planning processes.

PAF-type instruments are influenced by the European Commission Budget Support framework. The PAF design should ensure that indicators are simple and that systems are in place to produce the data necessary to monitor progress on a timely basis. The PAF as a whole is not necessarily used as the basis for budget support disbursement, although all disbursement indicators should be included in the PAF.

Each year, the national government will identify a concise list of the highest priority indicators and targets for the subsequent year, from its overall goals and targets. The selection of appropriate targets and indicators is the responsibility of the national planning ministry, in consultation with sector ministries and spending agencies, donor partners and other stakeholders. The PAF should include, as far as possible, indicative targets and indicators for the following two years based on medium-term commitments in the national strategy and medium term expenditure framework.

The World Bank Group's Country Partnership Framework (CPF) aims to make its country-driven model more systematic, evidence-based, selective, and focused on the World Bank's twin goals of ending extreme poverty and increasing shared prosperity in a sustainable manner. Used in conjunction with a Systematic Country Diagnostic (SCD), the CPF guides the World Bank Group's support to a member country.

A Systematic Country Diagnostic (SCD) informs each new CPF. The aim of the SCD is to identify the most important challenges and opportunities a country faces in advancing towards the twin goals. This is derived from a thorough analysis and informed by consultations with a range of stakeholders. SCDs are built on an analysis of data and existing studies by the World Bank Group and external partners, and aim at identifying the most critical constraints to, and opportunities for, reducing poverty and building shared prosperity sustainably. The SCD's findings take into account the views of a broad set of stakeholders, including the private sector.

To find out more…

- International Monetary Fund: Reform of the Fund's Policy on Poverty Reduction Strategies in Fund Engagement with Low-Income Countries—Proposals (2015)
- International Monetary Fund: IMF Support for Low-Income Countries (2021)
- World Bank Group: Policy and Procedure Framework (2018) with Directive for Country Engagement (2014)
- World Bank Group: templates with instructions for Country Partnership Framework (CPF), CPF Results matrix and Performance and Learning Review (PLR)
- World Bank Group: Country Engagement featuring the Country Partnership Framework; example: Kazakhstan Country Partnership Framework 2020-2025 (2019)

B.4.3. European Commission policy intervention areas and related statistical activities

General development strategies target development of overarching aspects of society such as economic growth or poverty reduction. To assess the progress in these fields, quantifiable information is needed on a wide range of aspects associated with the strategy. For example, Poverty Reduction Strategies and Economic Development Documents use a variety of indicators to quantify targets and measure progress.

These indicators are drawn from a wide range of statistics, including e.g., national accounts, price statistics, public finance statistics, balance of payments, population statistics, education statistics, health statistics, and obviously statistics on living conditions and poverty.

Although there are common characteristics across statistics areas, each statistics area has its own characteristics, challenges, sources, and data providers. The evidence base on specific statistics areas, which is required for policy formulation, implementation, monitoring, and assessment, may not be available, may be of inadequate quality, may need to be transformed to be comparable with other sources or may need to be interpreted with special care.

The sector chapters in parts D – G of this Guide provide detailed information on statistics needed to inform specific policy areas where the European Commission has a 'comparative advantage'. The chapters are organised according to the policy area they mainly inform. The statistics covered by the chapters are defined according to the Conference of European Statisticians' 'Classification of Statistical Activities' (CSA), which is used to classify statistical activities of international organisations and national actors. CSA is also used by PARIS21 to classify statistical activities in the Partner Report on Support to Statistics (PRESS), and a slightly revised version of its first three domains is adopted as part of the Statistical Data and Metadata eXchange (SDMX) Content-oriented Guidelines.

The chapters in parts D – G offer advice on how statistics and indicators from different sectors can be used to inform policies, to monitor progress and evaluate outcomes and impacts. The chapters present data needs and use for specific statistics areas and provide the main definitions and concepts used. They describe how data quality and data availability in the area can be improved and give practical advice and examples of how the statistical system can be developed.

To find out more…

- European Commission Staff Working Document SWD(2018) 444 final: A Revised EU International Cooperation and Development Results Framework in line with the Sustainable Development Goals of the 2030 Agenda for Sustainable Development and the New European Consensus on Development (2018)
- DG International Partnerships: Budget support website (including links to the European Commission Communication COM(2011) 638 'The Future Approach to EU Budget Support to Third Countries' and Budget Support Guidelines (2017))
- Eurostat: International cooperation
- Eurostat: International statistical cooperation – Overview
- Eurostat: International statistical cooperation tools
- Conference of European Statisticians (CES): Classification of Statistical Activities (CSA) 2.0
- PARIS21: Partner Report on Support to Statistics (PRESS)
- Statistical Data and Metadata eXchange (SDMX) Content-oriented Guidelines

Eurostat statistical cooperation contact email:

- ESTAT-STATISTICAL-COOPERATION@ec.europa.eu

B.5 International statistical classifications

B.5. International statistical classifications

The chapter in brief

International classifications are of great importance for the production of official statistics. The international official statistics community devotes a lot of resources in the development, maintenance and promotion of such classifications.

The chapter provides a brief introduction to international statistical classifications and continues with the presentation of a small number of important such classifications.

B.5.1. Introduction to international statistical classifications

Statistical classifications are indispensable tools for the producers of official statistics. The Best Practice Guidelines for Developing International Statistical Classifications, published under the auspices of the United Nations Statistics Division (UNSD), define a **statistical classification** as follows: 'A statistical classification is a set of categories which may be assigned to one or more variables registered in statistical surveys or administrative files, and used in the production and dissemination of statistics. The categories are defined in terms of one or more characteristics of a particular population of units of observation. A statistical classification may have a flat, linear structure or may be hierarchically structured, such that all categories at lower levels are sub-categories of a category at the next level up. The categories at each level of the classification structure must be mutually exclusive and jointly exhaustive of all objects in the population of interest.'

Principle 9 of the UN's Fundamental Principles of Official Statistics (see section B.2.1.2) states that 'The use by statistical agencies in each country of international concepts, **classifications** and methods promotes the consistency and efficiency of statistical systems at all official levels.' Similarly, the Principles of the African Charter on Statistics (Box 2.3) include the provision that 'African statistics … shall employ internationally recognized and accepted concepts, **classifications**, terminologies and methods.'

Indeed, the use of common classifications over time, between authorities and across statistical products, at domestic and international level, improves the comparability and coherence of official statistics, and makes easier their joint use in analyses.

International statistical classifications are being developed, maintained, and updated for several variables describing the phenomena measured in official statistics. The aim is that these classifications be adopted by national statistical authorities as such or as the basis for national statistical classifications. The UNSD presides the International Family of Classifications which contains approximately 150 classifications covering domains such as economics, demographics, labour, health, education, social welfare, geography, environment, tourism etc. Most of them have been approved as guidelines by the United Nations Statistical Commission or other competent intergovernmental bodies.

Each international classification is developed under the responsibility of a **custodian** international authority and with the cooperation of several competent international and national organisations. The custodian coordinates the work of the authorities for monitoring the classification's applicability and suitability for prevailing conditions in the phenomenon it refers to, and for revising it when its present version does not match adequately anymore these prevailing conditions. The UNSD, for instance, is the custodian of several international classifications, among which most of those presented in this chapter.

The UN Committee of Experts on International Classifications (UNCEISC; formerly known as the Expert Group on International Statistical Classifications) coordinates the international work on the development and maintenance of classifications. This Expert Group has published the aforementioned best practice guidelines and maintains the list of the international family.

National and regional statistical authorities usually develop statistical classifications conformant to international ones but with adaptations to the local conditions (e.g., further division of the lowest level of international classifications). AFRISTAT, for instance, publishes, adaptations of the international classifications ISIC and CPA, among others, for use by its member states, under the names of NAEMA and NOPEMA respectively. Two additional examples of regional variants of ISIC are the EU's Statistical Classification of Economic Activities in the European Community (NACE) and the North American Industry Classification System (NAICS) used by Canada, USA and Mexico.

Correspondence tables are used to convert from one classification to another or to update from an old version to the current version of a classification. Correspondence tables are provided, for instance, under the United Nations and Eurostat classifications links provided in the box 'To find out more' at the end of the chapter.

B.5.2. Main international statistical classifications

B.5.2.1. INTERNATIONAL STANDARD INDUSTRIAL CLASSIFICATION OF ALL ECONOMIC ACTIVITIES (ISIC)

The International Standard Industrial Classification (ISIC) is the reference classification for economic activities (industries) and is led by the UN Statistical Division. It is applied in several statistical domains: national accounts, business statistics, labour market statistics etc. Allocation to activities takes place according to the inputs, the process and technology of

production, the characteristics of the outputs and the use to which outputs are applied. The observed statistical unit are the enterprise, the establishment, the kind-of-activity unit or the local unit depending on the application.

The first ISIC, ISIC 1949, was adopted in 1948. Subsequent versions were ISIC revision 1 (or rev. 1), rev.2, rev. 3, rev. 3.1 and rev.4. The latest version is ISIC rev. 5, endorsed by the UN statistical Commission in 2023.

ISIC is not intended to substitute ISIC for national classifications of economic activities. It is desirable that countries use ISIC as a guide to adapt their national classifications to it. If a country lacks the resources to develop a national classification it is free, of course, to adopt ISIC. The USND Manual on ISIC rev. 5 presents rules for adapting ISIC to national specificities.

ISIC rev. 5 splits economic activities, in a hierarchical manner, into one-letter sections (top level of the classification), two-digit divisions, three-digit groups, and four-digit classes. The top level comprises 22 sections:

- **Agriculture, forestry and fishing (A)**
- **Mining and quarrying (B)**
- **Manufacturing (C)**
- **Electricity, gas, steam and air conditioning supply (D)**
- **Water supply; sewerage, waste management and remediation activities (E)**
- **Construction (F)**
- **Wholesale and retail trade; repair of motor vehicles and motorcycles (G)**
- **Transportation and storage (H)**
- **Accommodation and food service activities (I)**
- **Publishing, broadcasting, and content production and distribution activities (J)**
- **Telecommunications, computer programming, consultancy, computing infrastructure, and other information service activities (K)**
- **Financial and insurance activities (L)**
- **Real estate activities (M)**
- **Professional, scientific and technical activities (N)**
- **Administrative and support service activities (O)**
- **Public administration and defence; compulsory social security (P)**
- **Education (Q)**
- **Human health and social work activities (R)**
- **Arts, entertainment and recreation (S)**
- **Other service activities (T)**
- **Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use (U)**
- **Activities of extraterritorial organizations and bodies (V)**

The UNSD is responsible for the maintenance, update and revision of ISIC.

B.5.2.2. HARMONIZED COMMODITY DESCRIPTION AND CODING SYSTEM (HS)

The Harmonized Commodity Description and Coding System (HS) of the World Customs Organization (WCO) is used worldwide as a reference for classifications of external trade statistics and for customs tariffs. The HS is a classification of goods by criteria based on the materials, stage of production and functionality of commodities. The industrial origin criterion (i.e., the economic activity whose output is the commodity in question) is considered whenever it is compatible with the main criteria set out before.

The HS is at the heart of the whole process of harmonisation of international economic classifications being jointly conducted by the UNSD and Eurostat. Its items and sub-items are the fundamental terms on which goods are identified in product classifications.

The HS has the legal status of an international convention and has been in effect since 1.1.1988. Subsequent versions were HS 1992, 1996, 2002, 2007, 2012 and 2017. The latest version, implemented on 1.1.2022 is HS 2022. Earlier versions are still in use in several countries.

HS 2022 splits goods, in a hierarchical manner, into Roman numeral sections (top level of the classification), two-digit chapters, four-digit headings, and six-digit subheadings. The top level comprises 21 sections:

- **Live animals; animal products (I)**
- **Vegetable products (II)**
- **Animal, vegetable or microbial fats and oils and their cleavage products; Prepared edible fats; Animal or vegetables waxes (III)**
- **Prepared foodstuffs; Beverages, spirits and vinegar; Tobacco and manufactured tobacco substitutes; Products, whether or not containing nicotine, intended for inhalation without combustion; Other nicotine containing products intended for the intake of nicotine into the human body (IV)**
- **Mineral products (V)**
- **Products of the chemical or allied industries (VI)**
- **Plastics and articles thereof; Rubber and articles thereof (VII)**
- **Raw hides and skins, leather, furskins and articles thereof; saddlery and harness; travel goods, handbags and similar containers; articles of animal gut (other than silk-worm gut) (VIII)**
- **Wood and articles of wood; wood charcoal; cork and articles of cork; manufactures of straw, of esparto or of other plaiting materials; basketware and wickerwork (IX)**
- **Pulp of wood or of other fibrous cellulosic material; recovered (waster and scrap) paper or paperboard; paper and paperboard and articles thereof (X)**
- **Textiles and textile articles (XI)**
- **Footwear, headgear, umbrellas, sun umbrellas, walking-sticks, seat-sticks, whips, riding-crops and**

parts thereof; Prepared feathers and articles made therewith; Artificial flowers; Articles of human hair (XII)

- **Articles of stone, plaster, cement, asbestos, mica or similar materials; ceramic products; glass and glassware (XIII)**
- **Natural or cultured pearls, precious or semi-precious stones, precious metals, metals clad with precious metal, and articles thereof; imitation jewellery; coin (XIV)**
- **Base metals and articles of base metal (XV)**
- **Machinery and mechanical appliances; electrical equipment; parts thereof; sound recorders and reproducers, television image and sound recorders and reproducers, and parts and accessories of such articles (XVI)**
- **Vehicles, aircraft, vessels and associated transport equipment (XVII)**
- **Optical, photographic, cinematographic, measuring, checking, precision, medical or surgical instruments and apparatus; clocks and watches; musical instruments; parts and accessories thereof (XVIII)**
- **Arms and ammunition; parts and accessories thereof (XIX)**
- **Miscellaneous manufactured articles (XX)**
- **Works of art, collectors' pieces and antiques (XXI)**

The WCO is responsible for the maintenance, update and revision of HS. The ongoing revision of this classification is evidence of the commitment to systematise the improvement of the classification over time, keeping it current and making it more responsive to existing economic and technological reality while maintaining conceptual consistency.

B.5.2.3. STANDARD INTERNATIONAL TRADE CLASSIFICATION (SITC)

The Standard International Trade Classification (SITC) is an alternative classification of goods which, like the HS, is based on raw materials and the stage of production of commodities. Its latest version covers all goods covered by the HS, except for monetary gold, gold coin and current coin.

The first SITC was adopted in 1950. Subsequent versions were SITC revised, Revisions 2 (rev.2) and rev. 3. The current version is SITC rev. 4, which was accepted in 2006.

The subheadings of HS 2007 are the building blocks of SITC rev. 4. HS having been widely adopted for international merchandise trade statistics, SITC is now mostly used in economic analyses, e.g., for the study of long-term trends in international merchandise trade.

SITC rev. 4 splits goods, in a hierarchical manner, into single-digit sections (top level of the classification), two-digit divisions, three-digit groups, four-digit subgroups, and five-digit basic headings. The top level comprises 10 sections:

- **Food and live animals (0)**
- **Beverages and tobacco (1)**
- **Crude materials, inedible, except fuels (2)**
- **Mineral fuels, lubricants and related materials (3)**
- **Animal and vegetable oils, fats and waxes (4)**
- **Chemicals and related products, not elsewhere specified (5)**
- **Manufactured goods classified chiefly by material (6)**
- **Machinery and transport equipment (7)**
- **Miscellaneous manufactured articles (8)**
- **Commodities and transactions not classified elsewhere in the SITC (9)**

The UNSD is responsible for the maintenance, update and revision of SITC.

B.5.2.4. CENTRAL PRODUCT CLASSIFICATION (CPC)

The Central Product Classification (CPC) is a complete product classification covering all goods and services. It serves as an international standard for assembling and tabulating all kinds of data requiring product detail, including statistics on industrial production, domestic and foreign commodity trade, international trade in services, balance of payments, consumption and price statistics and other data used within the national accounts. It provides a framework for international comparison and promotes harmonization of various types of statistics related to goods and services.

The first, provisional CPC was published in 1991. Subsequent versions were Version 1.0, Version 1.1, and Version 2.0. The latest version is CPC Version 2.1, published in 2013. The primary purpose of Version 2.1 is to classify the goods and services that are the result of production in any economy. This production is accounted for in the national accounts of countries and can be measured and analysed using the System of National Accounts (SNA; see chapter F.17).

CPC Version 2.1 is useful in studying transactions in goods and services in detail. It can also be used as a basis for developing lists of goods and services for specific purposes, such as price statistics surveys, tourism statistics surveys or ICT-related surveys, with its primary advantage being that it meets the criteria of an international standard. It has broad acceptance and facilitates the maintenance of systems of categories of products, with regard to both character and definition. It can therefore serve as a framework for international comparison.

CPC Version 2.1 splits products and services, in a hierarchical manner, into one-digit sections (top level of the classification), two-digit divisions, three-digit groups, four-digit classes, and five-digit subclasses. The 10 top-level sections of Version 2.1 are the following:

- **Agriculture, forestry and fishery products (0)**
- **Ores and minerals; electricity, gas and water (1)**
- **Food products, beverages and tobacco; textiles, apparel and leather products (2)**

- **Other transportable goods, except metal products, machinery and equipment (3)**
- **Metal products, machinery and equipment (4)**
- **Constructions and construction services (5)**
- **Distributive trade services; accommodation, food and beverage serving services; transport services; and electricity, gas and water distribution services (6)**
- **Financial and related services; real estate services; and rental and leasing services (7)**
- **Business and production services (8)**
- **Community, social and personal services (9)**

Products are classified based on their physical properties and intrinsic nature, on one hand, and on the economic activity from which they originate. Each CPC subclass generally consists of the outputs of a specific class or set of classes of ISIC rev. 4. Furthermore, again with exceptions, especially for agricultural products, each subclass in sections 0 – 4 of CPC Version 2.1 consists of one or more subheadings of HS 2012.

The UNSD is responsible for the maintenance, update and revision of CPC. The ongoing revision of this classification is evidence of the commitment to systematise the improvement of the classification over time, keeping it current and making it more responsive to existing economic and technological reality while maintaining conceptual consistency.

B.5.2.5. CLASSIFICATION BY BROAD ECONOMIC CATEGORIES DEFINED IN TERMS OF THE HS AND THE CPC (BEC)

The Classification by Broad Economic Categories (BEC) is essentially a high-level aggregation of existing product classifications. It provides an overview of international trade based on the detailed commodity classifications in the SITC, the HS and the CPC. Its comparative advantage has traditionally been the classification of goods (and with BEC Rev. 5 also services) by end use category. This facilitates a range of analytical applications, such as the relative integration of economies in global value chains, and statistical applications, such as commodity flow approaches to estimating gross domestic product.

The original BEC was issued in 1971. Subsequent versions were revision 1 (rev. 1), rev. 2, rev. 3 and rev. 4. The latest version is BEC rev. 5, released in 2016, which is based on HS 2012 and CPC ver. 2.1. BEC Rev. 5 includes services for the first time.

The coding system of BEC rev. 5 is hierarchical and decimal. The classification consists of six dimensions, namely the dimension of broad economic categories (eight categories), the product dimension, the SNA end-use dimension (with three categories), the processing dimension (with two categories), the specification dimension (with two categories), and the durability dimension (with two categories). The basic categories of BEC are expressed as six-digit codes, where each digit indicates the category at that dimension. Note that a 0 is used to indicate the non-applicability of that dimension.

The eight top-level broad economic categories of BEC rev. 5 are the following:

- **Agriculture, forestry, fishing, food, beverages, tobacco (1)**
- **Mining, quarrying, refinery, fuels, chemicals, electricity, water, waste treatment (2)**
- **Construction, wood, glass, stone, basic metals, housing, electrical appliances, furniture (3)**
- **Textile, apparel, shoes (4)**
- **Transport equipment and services, travel, postal services (5)**
- **ICT, media, computers, business and financial services (6)**
- **Health, pharmaceuticals, education, cultural, sport (7)**
- **Government, military and other (8)**

The Statistical Paper on BEC rev. 5 presents the categories of all dimensions of the classification.

The UNSD is responsible for the maintenance, update and revision of BEC.

B.5.2.6. INTERNATIONAL STANDARD CLASSIFICATION OF EDUCATION (ISCED)

The International Standard Classification of Education (ISCED) is a classification of education programmes and related qualifications by education levels and fields. It has been designed as an instrument suitable for assembling, compiling, and presenting statistics of education both within individual countries and internationally. It is expected to facilitate international compilation and comparison of education statistics.

ISCED 2011 classifies education programmes and qualifications by level, the so-called ISCED-P and ISCED-A classifications respectively. In 2013, it was complemented by the revised classification of education and training fields (ISCED-F 2013).

The ISCED 2011 Operational Manual defines an **education programme** as 'a coherent set or sequence of educational activities or communication designed and organized to achieve pre-determined learning objectives or to accomplish a specific set of educational tasks over a sustained period.' An **educational qualification** is defined, in the same manual, as 'the official confirmation, usually in the form of a document certifying the successful completion of an education programme or a stage of a programme.'

The ISCED classification was developed initially in the 1970s and was first revised in 1997. ISCED 2011 is its second major revision and the first to introduce a classification of educational qualifications by level. It was adopted by the UNESCO General Conference in November 2011. It has **nine levels of education**, defined in the ISCED 2011 Operational Manual as follows:

- **Early childhood education (ISCED 0):** early childhood programmes that have an intentional education component. These programmes target children below the age of entry into primary education (ISCED level 1). They

aim to develop cognitive, physical and socio-emotional skills necessary for participation in school and society.

- **Primary education (ISCED 1):** Primary education usually begins at age 5, 6 or 7, and has a typical duration of six years. Programmes at ISCED level 1 are normally designed to give pupils a sound basic education in reading, writing and mathematics, along with an elementary understanding of other subjects such as history, geography, natural science, social sciences, art and music.
- **Lower secondary education (ISCED 2):** Programmes at the lower secondary education level are designed to lay the foundation across a wide range of subjects and to prepare children and young people for more specialised study at upper secondary and higher levels of education. The beginning – or the end – of lower secondary education often involves a change of school for young students and a change in the style of instruction. Lower secondary education has a typical duration of three years.
- **Upper secondary education (ISCED 3):** Programmes at the upper secondary education level are more specialised than those at lower secondary and offer students more choices and diverse pathways for completing their secondary education. The range of subjects studied by a single student tends to be narrower than at lower levels of education, but the content is more complex and the study more in-depth. Programmes offered are differentiated by orientation and often by broad subject groups. The typical duration of study at this level is three years.
- **Post-secondary non-tertiary education (ISCED 4):** Programmes at the post-secondary non-tertiary education level are not significantly more complex than those at the upper secondary level. They generally serve to broaden rather than deepen the knowledge, skills and competencies already gained through successful (full) level completion of upper secondary education. They may either be designed to increase options for participants in the labour market or for further studies at the tertiary level or both. Usually, programmes at ISCED level 4 are vocationally oriented. Their duration may range from six months to three years.
- **Short-cycle tertiary education (ISCED 5):** The content of ISCED level 5 programmes is noticeably more complex than in upper secondary programme(s) giving access to this level. ISCED level 5 programmes serve to deepen knowledge by imparting new techniques, concepts and ideas not generally covered in upper secondary education (whereas ISCED level 4 programmes serve to broaden knowledge and are typically not significantly more advanced than programmes at ISCED level 3). Their duration may range from two to three years.
- **Bachelor's or equivalent level (ISCED 6):** Programmes at ISCED level 6 are longer and usually more theoretically-oriented than ISCED level 5 programmes. They are often designed to provide participants with intermediate academic and/or professional knowledge, skills and competencies, leading to a first degree or equivalent qualification. They typically have a duration of three to four years of full-time study. They may include practical components and/or involve periods of work experience as well as theoretically-based studies. They are traditionally offered by universities and equivalent tertiary educational institutions.
- **Master's or equivalent level (ISCED 7):** Programmes at ISCED level 7 have a significantly more complex content than programmes at ISCED level 6 and are usually more specialised. The content of ISCED level 7 programmes is often designed to provide participants with advanced academic and/or professional knowledge, skills and competencies, leading to a second degree or equivalent qualification. Programmes at this level may have a substantial research component but do not yet lead to the award of a doctoral qualification. They typically have a duration of one to four years following studies at ISCED level 6.
- **Doctoral or equivalent level (ISCED 8):** Programmes at ISCED level 8 are designed primarily to lead to an advanced research qualification. Programmes at this ISCED level are devoted to advanced study and original research and are typically offered only by research-oriented tertiary educational institutions such as universities. Doctoral programmes exist in both academic and professional fields. The theoretical duration of these programmes is three years full-time in most countries, although the actual time that students take to complete the programmes is typically longer.

The coding schemes for programmes and qualifications provide detail at three digits' level. There is a high degree of correspondence between the two schemes but no perfect mapping from one to the other at the three-digit level.

The UNESCO Institute for Statistics (UIS) hosts ISCED mappings. These tables map national education systems' programmes and qualifications to ISCED (both 1997 and -for most countries- 2011 versions). The mappings promote the production of internationally comparable education statistics.

These mappings are essential tools for organizing information on national education systems, their programmes and related qualifications in order to ensure the cross-national comparability of education statistics and indicators and to assist analysts to understand and interpret them.

The ISCED 2013 Fields of Education and Training classification (ISCED-F 2013) was adopted in November 2013. The ISCED-F 2013 Manual defines a **field of study** as 'the broad domain, branch or area of content covered by an education programme or qualification.'

The classification splits fields into 11 broad fields and extends up to four-digit codes which define approximately 80 detailed fields. The broad fields are the following:

- **Generic programmes and qualifications (00):** Programmes and qualifications providing fundamental and personal skills education which cover a broad range of subjects and do not emphasise or specialise in a particular broad or narrow field.
- **Education (01)**
- **Arts and Humanities (02)**

- **Social Sciences, Journalism and Information (03)**
- **Business, Administration and Law (04)**
- **Natural Sciences, Mathematics and Statistics (05)**
- **Information and Communication Technologies (06)**
- **Engineering, Manufacturing and Construction (07)**
- **Agriculture, Forestry, Fisheries and Veterinary (08)**
- **Health and Welfare (09)**
- **Services (10)**

The UIS is responsible for the development, maintenance, updating and revision of ISCED.

B.5.2.7. INTERNATIONAL STANDARD CLASSIFICATION OF OCCUPATIONS (ISCO)

The International Standard Classification of Occupations (ISCO) is a classification for organising jobs into a clearly defined set of groups according to the tasks and duties undertaken in the job. It is intended both for statistical users and for client-oriented users. In official statistics, it is intended to facilitate international communication on the subject of occupations and occupational groups.

According to ISCO-08 Part 1: Introductory and methodological notes, a **job** is 'a set of tasks and duties performed, or meant to be performed, by one person, including for an employer or in self-employment', while **occupation** refers to 'the kind of work performed in a job' and is defined as a 'set of jobs whose main tasks and duties are characterized by a high degree of similarity.'

The first ISCO, ISCO-58, was published in 1958. Subsequent versions, published in the years indicated by their name, were ISCO-68 and ISCO-88. The latest version is ISCO-08, published in 2008.

As was also mentioned about ISIC, ISCO is not supposed to replace national classifications of occupations. It is intended to serve as a model with which national classifications will be aligned, so as to promote international comparability of national occupational statistics. However, ISCO-08 Part 1: Introductory and methodological notes advise countries that do not have the capacity to develop national classifications in the short to medium term to devote resources to implementing ISCO.

ISCO-08 splits occupations into 10 major groups, 43 sub-major groups, 130 minor groups, and 436 unit groups in a hierarchical manner. The major groups are the following:

- **Managers (Major Group 1):** Managers plan, direct, coordinate and evaluate the overall activities of enterprises, governments and other organizations, or of organizational units within them, and formulate and review their policies, laws, rules and regulations.
- **Professionals (Major Group 2):** Professionals increase the existing stock of knowledge; apply scientific or artistic concepts and theories; teach about the foregoing in a systematic manner; or engage in any combination of these activities.
- **Technicians and Associate Professionals (Major Group 3):** Technicians and associate professionals perform technical and related tasks connected with research and the application of scientific or artistic concepts and operational methods, and government or business regulations.
- **Clerical Support Workers (Major Group 4):** Clerical support workers record, organize, store, compute and retrieve information, and perform a number of clerical duties in connection with money-handling operations, travel arrangements, requests for information, and appointments.
- **Services and Sales Workers (Major Group 5):** Services and sales workers provide personal and protective services related to travel, housekeeping, catering, personal care, protection against fire and unlawful acts; or demonstrate and sell goods in wholesale or retail shops and similar establishments, as well as at stalls and on markets.
- **Skilled Agricultural, Forestry and Fishery Workers (Major Group 6):** Skilled agricultural, forestry and fishery workers grow and harvest field or tree and shrub crops; gather wild fruits and plants; breed, tend or hunt animals; produce a variety of animal husbandry products; cultivate, conserve and exploit forests; breed or catch fish; and cultivate or gather other forms of aquatic life in order to provide food, shelter and income for themselves and their households.
- **Craft and Related Trades Workers (Major Group 7):** Craft and related trades workers apply specific technical and practical knowledge and skills to construct and maintain buildings; form metal; erect metal structures; set machine tools or make, fit, maintain and repair machinery, equipment or tools; carry out printing work; and produce or process foodstuffs, textiles, wooden, metal and other articles, including handicraft goods.
- **Plant and Machine Operators and Assemblers (Major Group 8):** Plant and machine operators and assemblers operate and monitor industrial and agricultural machinery and equipment on the spot or by remote control; drive and operate trains, motor vehicles and mobile machinery and equipment; or assemble products from component parts according to strict specifications and procedures.
- **Elementary Occupations (Major Group 9):** Elementary occupations involve the performance of simple and routine tasks which may require the use of hand-held tools and considerable physical effort.
- **Armed Forces Occupations (Major Group 0):** Armed forces occupations include all jobs held by members of the armed forces. Members of the armed forces are those personnel who are currently serving in the armed forces, including auxiliary services, whether on a voluntary or compulsory basis, and who are not free to accept civilian employment and are subject to military discipline. Included are regular members of the army, navy, air force and other military services, as well as conscripts enrolled for military training or other service for a specified period.

ISCO-08 Part 3: Group definitions provides definitions of all levels' groups.

The International Labour Organization (ILO) is responsible for the maintenance, update and revision of ISCO. The ongoing revision of this classification aims to maintain ISCO up-to-date, following the changes happening in the world of work by revising and improving ISCO skill model and structure.

B.5.2.8. CLASSIFICATION OF INDIVIDUAL CONSUMPTION BY PURPOSE (COICOP)

The Classification of Individual Consumption According to Purpose (COICOP) is the international reference classification of household expenditure. It is part of a set of classifications of the functions of expenditure, also known as "functional" classifications and which have formed part of the system of national accounts since 1968. "Functional" classifications are designed to classify certain transactions of producers and of three institutional sectors, namely household, general government and non-profit institutions serving households. They are described as "functional" classifications because they identify the "functions" - in the sense of "purposes" or "objectives" - for which these groups of transactors engage in certain transactions.

COICOP is also used in several other statistical areas, such as: household expenditure statistics based on household budget surveys and the analysis of living standards; consumer price indices; international comparisons of gross domestic product and its component expenditures through purchasing power parities; and statistics relating to culture, sports, food, health, and tourism.

The first classification under the name COICOP was adopted by the United Nations Statistical Commission in March 1999. The current version, COICOP 2018, is the first revision of the classification. The revision is more detailed than the previous version, responding to the users' need for more detail, and addresses several other issues that required a revision of the classification. The new COICOP 2018 reflects the significant changes in goods and services in some areas, improves the links of COICOP to other classifications, and addresses emerging statistical, and policy needs of several international organizations. COICOP 2018 is currently in use in very few countries. Its wide adoption is expected to be gradual.

COICOP splits goods and services, in a hierarchical manner, into two-digit digit divisions (top level of the classification), three-digit groups, four-digit classes, and five-digit subclasses. The 15 top-level divisions are the following:

- **Food and non-alcoholic beverages (01)**
- **Alcoholic beverages, tobacco and narcotics (02)**
- **Clothing and footwear (03)**
- **Housing, water, electricity, gas and other fuels (04)**
- **Furnishings, household equipment and routine household maintenance (05)**
- **Health (06)**
- **Transport (07)**
- **Information and communication (08)**
- **Recreation, sport and culture (09)**
- **Education services (10)**
- **Restaurants and accommodation services (11)**
- **Insurance and financial services (12)**
- **Personal care, social protection and miscellaneous goods and services (13)**
- **Individual consumption expenditure of non-profit institutions serving households (NPISHS) (14)**
- **Individual consumption expenditure of general government (15)**

The UNSD is responsible for the maintenance, update and revision of COICOP.

B.5.2.9. CLASSIFICATION OF THE FUNCTIONS OF GOVERNMENT (COFOG)

The Classification of the Functions of Government (COFOG) is another "functional" classification. It is designed for classifying current transactions (such as consumption expenditure, subsidies and current transfers), capital outlays (capital formation and capital transfers) and acquisition of financial assets by general government and its subsectors.

COFOG has three levels comprising two-digit divisions (top level of the classification), three-digit groups, and four-digit classes. The 10 top-level divisions are the following:

- **General public services (01)**
- **Defence (02)**
- **Public order and safety (03)**
- **Economic affairs (04)**
- **Environmental protection (05)**
- **Housing and community affairs (06)**
- **Health (07)**
- **Recreation, culture and religion (08)**
- **Education (09)**
- **Social protection (10)**

There is now a distinct overlap between COFOG and COICOP because COICOP covers the expenditures of non-profit institutions serving households and the individual consumption expenditures of government as well as expenditures of households. Division 14 of COICOP covers the individual consumption expenditures of government. In other words, the disaggregations defined in this division relate to those groups and classes of COFOG which are defined as individual (rather than collective) expenditures.

The UNSD is responsible for the maintenance, update and revision of COFOG.

To find out more…

International coordination of work on statistical classifications

- United Nations Statistics Division classifications page
- UN Best Practice Guidelines for Developing International Statistical Classifications
- International Family of Classifications
- United Nations, classifications on economic statistics and correspondence tables

International Standard Classification of Education (ISCED)

- UNESCO Institute for Statistics (UIS)
- ISCED homepage
- ISCED 2011
- ISCED 2011 Operational Manual
- ISCED mapping page
- ISCED-F 2013
- ISCED-F 2013 Manual

International Standard Classification of Occupations (ISCO)

- International Labour Organization (ILO)
- ISCO homepage
- ISCO-08 Part 1: Introductory and methodological notes
- **ISCO-08 Part 3: Group definitions**

International Standard Industrial Classification of All Economic Activities (ISIC)

- United Nations Statistics Division
- ISIC homepage
- Manual on ISIC rev. 4 (English edition)

Harmonized Commodity Description and Coding System (HS)

- HS homepage
- World Customs Organization (WCO)

Standard International Trade Classification (SITC)

- SITC homepage

Central Product Classification (CPC)

- CPC homepage
- CPC Version 2.1 manual

Classification by Broad Economic Categories defined in terms of the HS and the CPC (BEC)

- BEC homepage
- Statistical Paper on BEC rev. 5

Classification of Individual Consumption by Purpose (COICOP)

- COICOP revision

Classification of the Functions of Government (COFOG)

- COFOG homepage

Regional classifications

- AFRISTAT classifications (in French)
- Eurostat classifications
- North American Industry Classification System (NAICS)
- North American Product Classification System

Guide to statistics in European Commission development cooperation

SUPPORT FOR STATISTICS

C.6 How to decide on a statistical action

C.6. How to decide on a statistical action

The chapter in brief

This chapter explains the aims and methods used to strengthen the capacity of countries to produce and publish statistics of good quality and to improve the ability of users to understand and analyse such statistics. This issue may arise when a country or region requests support to improve their results framework or when poor quality or absence of data required for policy / activity formulation, implementation, monitoring, and evaluation clearly impedes the national / joint development agenda of the country or region.

The chapter includes an overview of the concept of 'quality' in statistics: what should a developing country's statistical system be able to provide for its users? With the objective quality measures as a benchmark, the chapter also considers methods of evaluating a country's statistics and the system that produces them. The methods proposed start with the simplest and become progressively more systematic. It includes the most recent internationally agreed standards and tools for data management and quality frameworks.

C.6.1. The importance of National Statistical Systems

C.6.1.1 NATIONAL STATISTICAL SYSTEMS ARE GENERATORS OF OFFICIAL STATISTICS

National statistical systems, generally with a national statistical office (NSO) at the heart, are the key producers of official statistics. Without good statistics, governments face great problems in delivering efficient administration, good management, and evidence-based policy making. An effective and efficient national statistical system (NSS), providing regular and reliable data, is an important indicator of good policies and a crucial component of good governance. Quality statistics increase transparency and promote the accountability of policymakers by enabling media, non-governmental organisations, and citizens to monitor the activities of government.

Good and reliable statistics are also essential to international organisations and other donors. These need to assess where aid is most needed, whether resources are used efficiently, to measure progress and to evaluate results. Statistics are vital for mutual accountability between beneficiaries and donors and for a focus on results.

Regional cooperation is an engine of economic growth, development, and security. The European Commission supports a strengthened role for regional and sub-regional organisations in the process of enhancing international peace and security, including their capacity to coordinate donor support. International cooperation partners also need to make cross-country comparisons in order to evaluate the effectiveness of global and regional policies. Therefore, they are supporters of regional harmonisation of data, so that these become regionally comparable. With its extensive experience in harmonising classifications, definitions, concepts, and statistics in a large group of countries, the European Commission has often taken the lead in such international efforts. The role and activities in statistics of different regional and international organisations is explored in section B.2.4.

In low-income partner countries the national use of and interest in statistics may be low. However, promotion of evidence-based policymaking along with advocacy on the importance of statistics raises national user interest. This, together with strategic planning in the NSS, should substantially increase the interest and trust in statistics and thus the level of analysis.

The Paris Declaration on Aid Effectiveness (see section B.1.4.), the Accra Agenda for Action (AAA) and the Busan Action Plan for Statistics (see section B.1.3.3) encourage partner countries to set their own strategies for poverty reduction, improve their institutions and tackle corruption. National ownership of statistics implies that surveys first and foremost respond to the national need for data to inform policies and therefore to meet user needs.

Central to the European Consensus on Development (see section B.1.4.1.) are ownership of development priorities by partner countries, a focus on results, inclusive development partnerships, transparency, and mutual accountability. The EU defines its objectives based on the partner countries' own development priorities, supporting the policy processes for formulating these priorities, as well as the results frameworks to manage and report on them. The EU also works through strengthening and building on partner countries' own systems to deliver on policy objectives and implement development programmes.

For measuring progress towards the Sustainable Development Goals (SDGs) and their targets, data are produced by national statistical systems, ensuring national ownership. Countries are asked to strengthen collection of baseline data in order to better measure progress for each of the SDGs. A core element of the global indicator framework is the disaggregation of data, e.g., by gender, by age group or by rural versus urban population, and the coverage of particular groups of the population, in order to fulfil the main principle of the 2030 Agenda of "leaving no one behind". Thus, statistical capacity building is essential for national statistical systems to meet the demands of the 2030 Agenda.

C.6.1.2 DATA AVAILABLE THROUGH THE NATIONAL STATISTICAL SYSTEMS

The purpose of evaluating a country's statistics system is to understand what the country is currently capable of producing, in terms of quantity and quality of statistics, and what it actually does produce. A detailed evaluation will identify the major constraints to the system.

The best starting point in identifying statistics as a potential sector for support should be the national development

strategy or poverty reduction strategy. The ideal situation is that a National Strategy for the Development of Statistics (NSDS) exists (see section C.7.1) that is compatible with the national development strategy. If this does not exist, a national results framework that is based on or at least includes SDGs indicators can be the target for improvement.

If there is no means to obtain expert analysis of data coverage and quality and no recent analysis has been made, the non-specialist should examine a core indicator set for performance monitoring so as to look at what data exists and what their status is. If there is no agreed performance monitoring system, the World Bank's 'World Development Indicators (WDI)' can provide a core indicator set for the non-specialist to analyse. However, these indicators should not be used as the target for support.

Availability and reliability of data is a basic indicator of the condition of the statistical system. Indicators should be drawn directly from national sources to ensure that the country analysis is based on the most up-to-date data available and that there is agreement among the development partners on the data sources to be used.

The core economic data should be fairly complete and up to date. What 'up to date' means depends on how frequently, easily and rapidly data can be collected, processed and published. Discussions of the international recommendations for when data should be available are located in the relevant sector chapters of this Guide.

The national sources for key economic indicators are mostly the NSO and the Central Bank. However, data published by the World Bank are often used in practice. Key NSO data sources are ideally online databases, but in practice often national statistical yearbooks and periodic (usually quarterly or annual) statistical digests. Press releases give the most recent information, although they can be subject to revision. As a matter of principle, national data sources should be preferred. In particular, this is the case where there is no need for cross-country comparison.

Data availability for the other SDGs indicators may be less straightforward than for economic and demographic data. Data may originate from outside the NSO, such as from Ministries for Health, Ministries for Education, Ministries for Rural Development etc. Coordination among statistics producers and publishers can be difficult and there are more likely to be 'competing' duplicate statistical publications than with the economic data. However, the focus on collecting and compiling reliable data for the SDGs indicators has often improved coordination. In cases where several potential sources are available, identification of the best source usually requires sector knowledge. Social data are generally less frequently updated than economic and demographic data. In some such cases, appropriate methods are used to project estimates for years in which no new data are collected. Such estimates should be clearly indicated in the published data.

It is essential to use the most recent version of the data. It is therefore necessary to keep a record (metadata) of the source (publication, edition, and publication date) of each data series and, if necessary, each data point.

Many partner countries' NSOs and Central Banks have websites, although they may not be stable. These websites vary enormously in structure and quality, and the update frequently may vary strongly.

A checklist on the key points to look at when analysing national data is given in Box C.6.1. The first points to be checked are general; the later points are more specific, but most of them can still be checked by someone with no specialist knowledge.

Box C.6.1: Key questions for examining national data

- Are data that cover performance indicators available from national sources?
- Is the statistical information about the sector sufficiently up to date so that it can be used to evaluate progress against a baseline?
- Will the frequency of data publication allow the monitoring of the programmes of interest?
- Are the data sufficiently disaggregated for activity monitoring and evaluation?
- When is the base year for quantity or index calculations? Is the base year more than 10 years old?
- Do the statistics appear to be reliable at first glance?
    - Are the current data easy to obtain? Can they be found on the internet?
    - Are there 'competing' data sources on the same subject published by more than one organisation?
    - Is methodological documentation available?
    - Are there references to international methods and classifications and do they appear to be adhered to?
    - Do the data broadly meet the international quality standards as applied to the sector?
    - For economic statistics, are the national data broadly comparable with international sources?
- Is the current data easy to obtain? Can it be found on the internet?
- Are there 'competing' data sources on the same subject published by more than one organisation?
- Is methodological documentation available?
- Are there references to international methods and classifications and do they appear to be adhered to?
- Does the data broadly meet the international quality standards as applied to the sector?
- For economic statistics, is the national data broadly comparable with international sources?

Measuring and monitoring development outcomes require timely, reliable, comparable, relevant, and accessible survey data. In many partner countries, survey programs rarely provide the necessary flow of reliable, timely, comparable and accessible data. The timing of national surveys is rarely optimal, data collection programs lack methodological consistency, and existing data often remain largely unexploited. In many cases, it is difficult to get a comprehensive picture of which data are actually collected throughout the national statistical system.

C.6.1.3 INTERNATIONAL SOURCES AS DATA SOURCES AND QUALITY REFERENCES

International data sources are useful for a first examination of a country's statistical system, even though their primary purpose is to act as a basis for comparisons between countries. The differences between data from national and international sources can provide a pointer either to the ease of communications between the country and the compiler of the international data or to the confidence that the international organisation has in the national data, although it can be difficult to distinguish between these two situations.

Eurostat has made available for European Commission staff a number of important indicators. The data are mostly sourced from international organisations, in particular the World Bank and IMF. The main international data sources were first presented in section B.2.4. The IMF Statistical Annexes are particularly useful for looking at the quality of economic statistics such as GDP. These annexes are not adjusted to follow a set format or to be comparable between countries. For this reason, these data give an indication of the IMF's view of the data quality: if the data in this document are similar to the data in national publications, this may imply a positive view by the IMF of the country data.

Data in the United Nations Statistics Division's SDG Global Database can be compared with national data sources on social issues. There can be a variety of possible causes for national data to be missing, estimated or very different from nationally published data in the international database. Considerable sector knowledge is often required.

Looking at the available international data and trying to find their national counterparts can give an idea of how accessible the statistics are and to what extent they contain or give directions for finding the metadata. The United Nations Statistics Division's countryData database provides data both from national sources and corresponding data from international sources. The database also provides concise comparisons between the national and international estimates of development indicators and explains the reasons for any differences. This helps users to make informed decisions as to which data are most appropriate for their needs.

In certain cases, data not available at national level may be replaced by data available through international sources. This can be the case e.g., when international organisations have used nowcasting and/or forecasting techniques to produce estimates, when data too uncertain to be published at national level have been further processed and improved by use of secondary sources or data structures from similar countries etc. However, using international sources should only be a temporary solution. If key data are missing at national level, the medium- and long-term objective must be to develop the statistical system's capacity to provide such data, according to sound methodology, international standards and classifications, and with good quality. Above all, the statistical system must be enabled to produce the data long term. In other words, the sustainability of the data provision process must be assured. Strengthening of the capacity of the national statistical system and strategic development of statistics are described in chapter C.7.

To find out more…

- The United Nations Statistics Division lists internet addresses of partner country National Statistical Offices Websites
- IMF Statistical Annexes
- The UN Statistics Division's SDG Global Database, covers a wide range of social, economic and environmental indicators for agreed policy goals
- The UN Statistics Division's countryData database provides data from national sources and corresponding data from international sources, provides concise comparisons between them, and explains any differences.

C.6.2. Assessing the capacity of the National Statistical System

C.6.2.1 OBJECTIVE OF THE ASSESSMENT

Statistical quality is most often defined as 'fitness for use' by end users. Quality therefore depends on data uses and users. Various users – local, national, and international – can have different demands. Analysis of statistical quality permits the identification of target areas for capacity building.

The analysis so far has covered the data and other basic facts of the national statistical system. It may have arrived at some tentative conclusions concerning the quality of the data available for use for policy making and management and for European Commission development cooperation in particular. The demand for statistics for policy formulation and management is the point of departure for both an assessment of an NSS and for a medium term statistical strategy more generally. Approaches to statistics strategies are discussed in more depth in section C.7.1.

Correcting widespread deficiencies in published statistics requires an understanding of their causes, direct and indirect. Any fruitful analysis of the NSS must be undertaken and owned by the country itself. Thus, prior support at the political level is essential for an in-depth assessment, including recognition of the resources required for an effective statistics system. Support for an assessment should be a precursor to medium term support for statistics capacity development.

Providing support for assessing an NSS is a strategic choice. It should be discussed with the development partners in a country. As in any other field, a strategic diagnosis and recommendations should be owned by the partner country and agreed and shared by development partners. This forms a basic starting point towards coordination.

C.6.2.2 THE ISSUES TO BE ADDRESSED

The typical difficulties that face an NSS can be classified into:

- Legislation and strategic relationships with government and within the NSS (these were outlined in section B.2.3);
- Financing and consequent human resources issues;
- Systems and infrastructure.

A detailed assessment of the NSS must obtain sufficient information on these issues to allow appropriate conclusions to be drawn.

As with other government departments, the NSO and other statistics producers may not receive sufficient financing from the national government. Lack of funding could be due to:

- Overall lack of government funds and / or budgeting problems at government level;
- Lack of understanding of the need for and use of statistics and / or;
- Lack of confidence in the NSO to deliver quality statistics for policy purposes.

Largely as a consequence of financial problems, human resources difficulties such as low salary levels or late payment of salaries are typical problems for NSOs and other statistics producers. These problems may arise also in other government departments, but personnel issues that might be more evident for statistics producers include:

- Staffing structures that do not reflect current working methods, showing relatively high numbers of low-level technical personnel, even if the total number of staff is appropriate;
- Lack of current knowledge and / or skills (at any grade and staff age);
- Absence of human resources strategy or staff training strategy;
- Brain drain towards the private sector.

Some NSOs have been established as public bodies outside national civil services, which may give them greater control and flexibility over staff grading, pay scales and budget certainty. However, institutional independence does not necessarily eliminate any of these problems. NSO senior management may respond to the impact of financial problems on human resources in a sub-optimal way. Statistics managers may not have adequate training or incentive to allow them to focus sufficiently on building, maintaining, and updating their department's operational manuals. Managers can therefore lose touch with how data are actually collected on the ground. Such lack of institutionalised knowledge could imply that data quality could suffer from changes in management or in local supervisory staff.

Systems and infrastructure problems that may be faced by NSOs and other major statistics producers include statistics software systems and, more generally, computing, communications and offices that are out of date. Regional statistical harmonisation requires similar classifications to be used, often necessitating recently updated software.

A key reference on the organisation of national statistical systems is the UNSD's 'Handbook on Management and Organization of National Statistical Systems'.

C.6.2.3 ASSESSMENT METHODOLOGIES

Since some but not all of the difficulties facing statistics producers are common to other public sector institutions, an assessment methodology must both integrate the NSS study with other public sector institutional assessments and also pay attention to the specific problems facing statistics. One solution is for the development and implementation of a statistics strategy as part of a general public sector reform programme.

General public sector assessment methodologies are outside the scope of this Guide. The overall methodologies for developing statistics strategies are presented in section C.7.2. As part of these methodologies, international organisations have developed assessment methods that are specific to statistics. An important contribution to this work was the 'Statistical Capacity Building Indicators' analysis developed by the PARIS21 Task Team on Statistical Capacity Building Indicators.

PARIS21 focuses its efforts on encouraging and assisting all low-income and lower middle-income countries to design, implement, and monitor National Strategies for the Development of Statistics (NSDS) and to have nationally owned and produced data for all SDGs indicators. Countries need to have an overall vision of the development of their national statistical system, which

- will include the national, regional, and international needs;
- be part of the country development and poverty reduction policy;
- serve as a framework for international and bilateral assistance;
- include all parts of the data production units and address the issues related to the analysis and use of data;
- follow the international standards including quality; and
- build on all past and existing activities and experiences.

In practice, the set of indicators developed by the PARIS21 Task Team appeared to be too heavy for the countries as well as for the international bodies. However, a number of the proposed tools and principles are used in the different data quality assessment frameworks, in the IMF's Reports on Observance of Standards and Codes (ROSC) and in the World Bank's Statistical Performance Indicators.

Statistics are a vital element of the whole cycle of political priority setting, project definition, planning, financing, implementation, and evaluation. Based on its experience as a technical reference throughout this cycle, Eurostat has considered some of the most pressing problems that may limit the success of statistical cooperation activities.

A key problem is ensuring the sustainability and resilience of the results achieved. The support provided by Eurostat and other Directorates-General should be refined to enable objective measurement and increase the sustainability of the

results of statistical cooperation activities, thus making more effective use of available resources.

Eurostat has developed a tool for assessing the organisation and effectiveness of NSSs and their capacity to produce quality data. The 'Snapshot' tool provides a quick and easy-to-interpret picture of the main strengths and weaknesses of the NSS, based on internationally agreed principles (UN Fundamental Principles of Official Statistics and similar work) and criteria. The tool and its capabilities are presented in Box C.6.2 below.

Box C.6.2: A tool for EU delegations to create a 'Snapshot' of National Statistical Systems and their capabilities

EU cooperation is led by the key principles of partnership and ownership. As a consequence, the assessment of the performance of national development policies and of EU interventions in support of these policies is based on statistical data that are provided by the national authorities. These statistical data are used to elaborate indicators that are the foundation for assessment of the results achieved; often, they are triggers for the release of funding. It is thus vital that these indicators are reliable and that the national statistical system as a whole is credible, i.e. of good quality.

Eurostat has developed a tool called 'Snapshot'. This tool translates the complex statistical quality framework into a clear and easy-to-understand assessment of the status and the development of key aspects of statistical systems. The results can be used to analyse the whole NSS or key sectors. The Snapshot Tool was originally based on the European Statistical System (ESS) Quality Assurance Framework, adjusted to consider the context of statistics in other regions of the world. During the first six months of 2023, Eurostat worked on a new version that improves the coverage of other international frameworks, in particular the United Nations Fundamental Principles of Official Statistics and the United Nations National Quality Assurance Framework (see section B.2.1.). The revision takes into account diversity (including gender issues). Finally, it has benefited from the experience gathered in Africa and Latin America.

The tool comprises 2 modules:

1. a **first module** providing a diagnostic of the national statistical system as a whole by focusing on the institutional, legal and organisational aspects.
2. a **second module** providing a method to assess data quality in specific sectors and indicators in these sectors. The concept is designed in such a way that it fits a wide range of sectors. It is divided into two parts: one dedicated to sector assessment (38 questions) and the other assessing the key indicators of the sector (7 questions).

The questions cover:

The legal, institutional and strategic framework at national or sector level (i.e., legal and institutional framework supporting the production of statistics, integration and coherence with the strategic framework supporting statistics development)

- The adequacy of resources (i.e., personnel in adequate quantity, quality of the personnel involved in statistics, equipment and infrastructure, financing)
- The determinants of data quality (i.e., quality commitment, professional independence, impartiality, objectivity, methodology and appropriate statistical procedures)
- The relations with users (i.e., relevance, accessibility)
- Specifically for Module 2: information on the statistical production in the sector (i.e., list of the statistics regularly produced in the sector).

The pre-defined answers give an intuitive colour code for good, average and poor achievement for the issue concerned. This approach provides an easy-to-understand assessment.

Source: Eurostat: Capacity building tools – The Snapshot

The World Bank's Statistical Performance Indicators are measuring the capacity and maturity of national statistical systems. They are based on a diagnostic framework which identifies five pillars of statistical performance: a) data use, b) data services, c) data products, d) data sources, and e) data infrastructure. The pillars 'break down' into 22 dimensions and 51 indicators. The values of the indicators are combined to compute the scores for the dimensions, the pillars and, at the top, the **Statistical Performance Index (SPI)**.

The SPI covers 174 countries; data on indicators are available for an additional 43 economies but are not sufficient to compute the SPI. The indicators are produced annually, and the available series of the SPI currently covers the period 2016 – 2019. The data for the indicators come from the World Bank, IMF, Open Data Watch, PARIS21, ILO, WHO, UNESCO, IHSN, UN, and FAO. It is noted that the SPI has replaced the Statistical Capacity Index, which was discussed in the 2021 edition of this Guide.

Statistical capacity is closely related with data quality. Two data quality tools developed by the IMF contain elements directly relevant to assessing statistical capacity of partner countries. The Enhanced General Data Dissemination System (e-GDDS), presented in Box C.6.5, superseded the previous GDDS in 2015. The e-GDDS encourages participants to emphasize data publication, assisting participants in improving data transparency and governance through release of data essential for macroeconomic analysis of conditions on a disciplined release schedule. Data should be published according to a set release schedule and in a standardised format, thus facilitating data sharing. The data coverage of e-GDDS is focused on four data categories essential for macroeconomic monitoring: real sector statistics (incl. national accounts (GDP) and consumer price index); fiscal sector statistics (government operations and gross debt); fiscal sectors statistics; external sector statistics (incl. balance of payments, external debt, international trade in goods, international investment positions, exchange rates). The Data

Quality Assessment Framework (DQAF), presented in Box C.6.6, builds on five dimensions of data quality: assurances of integrity, methodological soundness, accuracy and reliability, serviceability, and accessibility. The DQAF, which is used for comprehensive assessments of countries' data quality, covers institutional environments, statistical processes, and characteristics of the statistical products.

The United Nations Statistics Division has developed a National Quality Assurance Framework (NQAF). The NQAF is described in detail in the United Nations National Quality Assurance Frameworks Manual for Official Statistics (UN NQAF Manual), which was developed by the Expert Group on National Quality Assurance Frameworks (EG-NQAF). The Manual and its recommendations were adopted by the United Nations Statistical Commission in March 2019. It is an important contribution in guiding countries in the implementation of a national quality assurance framework, including new data sources, new data providers, and data and statistics of the SDGs indicators. The implementation of the NQAF is supported by workshop in different regions.

A peer review is an external assessment focused on a national statistical institute with the aim to develop recommendations to improve it. Peer reviews are a key instrument in the European Statistical System's strategy to monitor the implementation of the ESS Code of Practice. Their objective is to review the compliance/alignment of the EU Member States, EFTA countries and Eurostat with the Code of Practice and to help the statistical authorities in the ESS to further improve and develop their national statistical systems.

In its work to support partner countries and countries in its neighbourhood to further develop and improve their national statistical systems, Eurostat has carried out or supported peer reviews, 'light' peer reviews, sector reviews and adapted global assessments of NSOs and NSS in numerous countries. For the EU candidate countries and potential candidates, and the European Neighbourhood Policy (ENP) countries Eurostat has financed and played an active part in managing the process. Assuring transparency of the process, the reports and associated synthesis reports of the peer reviews and global assessments are made available to the public through Eurostat's website. An overview of the approach is presented in Box C.6.3.

Box C.6.3: Eurostat: peer reviews, light peer reviews, sector reviews and adapted global assessments of NSOs and NSSs in candidate countries and potential candidates and in ENP countries

Peer reviews

Peer reviews are qualitative assessments of how compliant a country's statistical system is with the European Statistics Code of Practice. The peer reviews result in a set of recommendations, the implementation of which is followed up and monitored by Eurostat. The methodology of these reviews is the same as that of the peer reviews carried out in the Member States and Eurostat.

Generally, as preparation and basis for the peer review, countries are required to complete self-assessment questionnaires:

- a full and a light questionnaire on compliance with the Code of Practice;
- a questionnaire on coordination within the statistical system;
- a questionnaire on cooperation within and integration achieved by the ESS.

Two guides explaining the exercise, one for the statistical authorities and one for the peer reviewers, are also provided.

Light peer reviews

Light peer reviews target countries with relatively well-developed statistical systems that are on the way to join the EU. Light peer reviews might be considered as precursors of standard European Statistical System peer reviews.

The objectives of Light peer reviews are:

- to assess compliance of the reviewed NSO, in particular with Principles 1 to 6 (i.e. professional independence, mandate for data collection, adequacy of resources, commitment to quality, statistical confidentiality, impartiality and objectivity, respectively) and 15 (i.e. accessibility and clarity) of the European Statistics Code of Practice;
- to evaluate the coordination role of the NSO within the statistical system;
- to highlight transferable practices suitable to foster compliance with the European Statistics Code of Practice;
- to recommend improvement actions needed to fully comply with the European Statistics Code of Practice.

Sector reviews

Sector reviews analyse the statistical production processes in specific sectors in detail. They are specifically tailored to selected partner countries that aim to align important sectors of statistics with European standards.

Sector reviews have the following specific objectives:

- to assess the administrative and technical capacity of the reviewed statistical systems to produce statistics in the sector concerned;
- to assess the statistical production in the relevant sector;
- to assess the statistical production against the EU acquis;
- to review the medium and long-term planning within the sector;
- to propose a list of recommendations to be undertaken in order to improve the data delivery and functioning of the sector under review.

Adapted global assessments

Adapted global assessments are comprehensive reviews of a country's statistical system that are tailored towards the needs of countries with a European perspective which have the intention to align their statistical production to European standards. Adapted global assessments assess the entire national statistical infrastructure and some selected statistical domains of the reviewed country.

The objectives of Adapted global assessments are:

- to assess the administrative and technical capacity of the statistical system;
- to assess the statistical law and other legal acts and their compliance with European and international recommendations and principles;
- to assess the mechanisms used by the national statistical office to coordinate the statistical system;
- to review the medium and long-term planning mechanisms in place;
- to propose a list of actions to be undertaken in order to improve and strengthen the statistical system;
- to assess the statistical production against the EU acquis in statistics.

The reports from these reviews and global assessments are available on Eurostat's website at Enlargement countries – Reports on reviews and at European Neighbourhood Policy countries - Reports on reviews

Source: Eurostat's website on International cooperation

In Africa, peer reviews are one of the actions aimed at strengthening NSOs and NSSs, specifically under Strategic objectives 3.1 'Reform and enhance national statistical systems' and 3.2 'Develop sustainable statistics capacity' of the Updated Strategy for the Harmonisation of Statistics 2017-2026 (SHaSA 2) (see section B.1.2.3). The target is to have performed peer reviews of the NSS of 54 countries in 2026. PARIS21 facilitated peer reviews for the NSS in a number of African countries since 2005, assessing the capacity to produce, disseminate and use official statistics. Within the framework of the Pan African Statistics Program (PAS), financed by the Europe-Africa partnership and with practical support by Eurostat, the methodology has been renewed and further developed, but still relies on the African Charter on Statistics as reference and benchmark throughout the process, together with the UN's Fundamental Principles of Official Statistics (see section B.2.1). The practical approach is based on Eurostat's 'Snapshot' tool for evaluation of statistical systems (see Box C.6.2). Eurostat has also produced a leaflet presenting the Methodology for Peer reviews of National Statistical Institutes and National Statistical Systems in African countries. It should be noted that this process was mutually beneficial; the Snapshot methodology was further developed and improved through the experiences gathered in the process of the peer reviews of African NSOs and NSSs. Similar benefits were drawn from assessments of NSSs in Latin America.

To find out more…

- United Nations Statistics Division: Handbook on Management and Organization of National Statistical Systems
- PARIS21 Task Team Statistical Capacity Building Indicators: "Statistical Capacity Building Indicators - Final report" (2002)
- World Bank: Statistical Performance Indicators, Measuring the Statistical Performance of Countries: An Overview of Updates to the World Bank Statistical Capacity Index (technical note) and SPI Data Portal
- IMF: Extended General Data Dissemination System (e-GDDS) (2015) and Data Quality Assessment Framework (DQAF) (2012)
- Eurostat and the European Statistical System: Quality Assurance Framework of the European Statistical System (version 2.0) (2019)
- Eurostat: Monitoring of implementation in the ESS of the revised European statistics Code of Practice, EU candidate countries and potential candidates: Peer reviews, light peer reviews, sector reviews and adapted global assessments and European Neighbourhood Policy (ENP) countries: Global assessment reports, light peer reviews and sector reviews
- African Union and Eurostat: Peer reviews of National Statistical Institutes and National Statistical Systems in African countries — An outline of the methodology (leaflet, 2017); Pan African Statistics Programme: final training on the Snapshot tool (2017)
- Pan-African Statistics Programme (PAS): Peer reviews of NSIs/NSSs in African countries: proposed methodology (draft, 2016)
- Eurostat: Capacity building tools – The Snapshot

C.6.3. The concept of quality in statistics

C.6.3.1 THE KEY QUALITY CONCEPTS IN STATISTICS

Internationally adopted quality frameworks for statistics are used for assessing the quality of the data and the procedures that are used in their production. They are practical applications of the principles of statistics, notably the **United Nations Fundamental Principles of Official Statistics**, which were explored in section B.2.1. As such, all statistics quality frameworks cover the various dimensions of quality. Quality frameworks consider all steps of the statistical process by which data are collected, transformed and disseminated. They therefore refer to the quality of the:

- overall organisation of the process;
- input data;
- data collection, transformation and dissemination operations;
- products (output data).

The approach of the European Statistical System comprises the institutional environment, statistical process, and statistical outputs, in line with European Statistics Code of Practice referred to in chapter B.2:

Institutional environment

Institutional and organisational factors have a significant influence on the effectiveness and credibility of a statistical authority producing and disseminating European Statistics. The relevant issues are professional independence, coordination and cooperation, mandate for data collection and access to data, adequacy of resources, commitment to quality, statistical confidentiality and data protection, impartiality and objectivity.

Statistical processes

European and other international standards, guidelines and good practices must be fully observed in the processes used by the statistical authorities to organise, collect, process and disseminate official statistics. The credibility of the statistics is enhanced by a reputation for good management and efficiency. The relevant aspects are sound methodology, appropriate statistical procedures, non-excessive burden on respondents and cost effectiveness.

Statistical outputs

Available statistics must meet users' needs. Statistics comply with the European quality standards and serve the needs of European institutions, governments, research institutions, business concerns and the public generally. The important issues concern the extent to which the statistics are relevant, accurate and reliable, timely, coherent, comparable across regions and countries, and readily accessible by users. These dimensions can be specified as follows:

1 - Relevance refers to the degree to which statistics meet current and potential users' needs for information,

- relevance to current policy questions,
- disaggregation, especially geographic, to an appropriate level, and
- representative coverage

2 – Accuracy and reliability refer to the closeness of estimates to the unknown true values

- survey quality: planning, execution, reporting, and audit trail,
- scientific validity: employing appropriate sampling techniques; ensuring impartiality and appropriate sample size,
- respect for data confidentiality,
- explicit incorporation of a quality framework or procedure

3 - Timeliness refers to the length of time between the reference period (the event or phenomenon that the data describe) and the data release date, when data become available; **Punctuality** refers to the length of time between the data release date and the target delivery date (for instance with reference to dates announced in an official release calendar, laid down by Regulations or previously agreed with partners).

4 - Comparability refers to the impact of the differences in applied concepts and measurement tools and procedures when statistics are compared between geographical areas, sectoral domains or over time; **Coherence** refers to the adequacy of the data to be reliably combined in different ways and for various uses

- metadata standards: is the background documentation complete and publicly available?
- adherence to current international standard methodologies and nomenclatures,
- consistency within national statistics (are classifications and statistical concepts consistent from one area of statistics to another?),
- consistency with data published by various international organisations, and
- international quality comparisons and peer review.

5 - Accessibility and **clarity** refer to the conditions and modalities by which users can obtain, use and interpret data

- publication and dissemination methods,
- full availability of results and metadata, and
- orienting publications toward the users of statistics.

The principles of the Code of Practice represent a common quality framework for the ESS. On its website, Eurostat publishes standards, handbooks and guidelines relating to quality management and quality reporting developed within the European Statistical System. The Quality Assurance Framework of the ESS (version 2.0) provides methods and tools at institutional and process level on how the Code of Practice can be further implemented. Together with the general quality management principles, the ESS statistics Code of Practice (2017) and the ESS Quality Assurance Framework (2019) constitute the common quality framework of the ESS.

Box C.6.4 gives a practical example of how the Terms of Reference for a statistical capacity development action or another operation aimed at strengthening national or sector statistics can be specified in order to assure a high quality of the outcomes.

Box C.6.4: Improving quality in a major statistical capacity building operation – points for the Terms of Reference

Terms of reference for a statistical capacity development action or another major statistics operation such as a large survey or census should refer to the methods to be used to ensure quality. This could be either an exposition of how quality will be addressed or a commitment to apply a specific quality methodology from the planning stage onwards. It should include a reference to the means of monitoring: self-assessment, peer review, quality assessment framework etc.

Frequently, NSOs have limited experience in selecting, specifying or applying a quality methodology. Hence, a quality assessment is usually needed. This looks at a statistical system's capacity and outputs. It identifies key areas for improvement, e.g., statistical legislation, training and technical assistance to assist in planning and implementing quality methods could be appropriate. There should be a general commitment to applying a quality methodology.

Terms of reference to implement a quality methodology could be based on the following:

1. The statistical action will ensure quality by implementing the appropriate general or sector quality assessment framework
2. For each of the quality framework indicators, the quality report will show:
   - the indicator;
   - the current status or value of the indicator;
   - the source of this measurement;
   - the objective for this indicator and explanation for the choice of this objective;
   - the activities required to achieve this objective (within the action being planned or not);
   - the resources required to carry out the action (within the action being planned or not)

Sources: International Monetary Fund's Data Quality Assessment Framework (DQAF) and Eurostat's Snapshot tool.

C.6.3.2 EXAMINING DATA QUALITY

The assessment of a country's statistics may be triggered by a realisation that at least some of the data required to carry out the European Commission's cooperation programme with its partner are non-existent, late, inaccurate, inappropriate to the needs and / or not comparable with the country's other data or relevant international classifications.

The first questions to be asked are: what is the extent of the statistics' problems, who has observed them, what analyses have been made and what plans have been prepared?

Information sources about data quality include existing analyses of the data from a number of sources, such as:

- a medium-term statistics strategy such as an NSDS (explained in section C.6.4) by national or international consultants;
- the Commission's experience in development cooperation with its partners;
- international sources.

Assessments of data quality, sectoral and global, should be summarised in the analysis of the national development policies. These **should identify when the available statistics are unable to support analysis** of the social, economic or environmental situation in question.

There are a number of tools available for assessing data quality. Eurostat's 'Snapshot' tool, which has been extensively used in practice, was presented in Box C.6.2, and Eurostat's peer review approach in Box C.6.3. One tool provided by the IMF is the Enhanced General Data Dissemination System (e-GDDS), presented in Box C.6.5. Another is the United Nations Statistics Division's National Quality Assurance Framework (NQAF), presented in Box C.6.6. Further relevant quality frameworks for statistics are the Quality Framework for OECD Statistical Activities and the International Organization for Standardization's ISO 9000 family of quality management standards.

Box C.6.5: IMF: Enhanced General Data Dissemination System (e-GDDS)

The purposes of the IMF's Enhanced General Data Dissemination System (e-GDDS) are to:

- encourage member countries to improve data quality;
- provide a framework for evaluating needs for data improvement and setting priorities in this respect; and
- guide member countries in the dissemination to the public of comprehensive, timely, accessible, and reliable economic, financial, and socio-demographic statistics.

The e-GDDS framework is intended to provide guidance for the overall development of macroeconomic, financial, and sociodemographic data. The framework takes into account, across a broad range of countries, the diversity of their economies and the developmental requirements of many of their statistical systems.

Member countries of the IMF voluntarily elect to participate in the e-GDDS. Participants are requested to update their metadata if and when significant changes in their statistical practices or plans for improvement take place, but at least once a year.

With regard to comprehensive frameworks, the objective of the e-GDDS is to encourage the production and dissemination of complete sets of data with the widest coverage possible, based on international methodologies. The emphasis is placed on complete data sets rather than on specific indicators.

The e-GDDS framework is built around four dimensions:

- data characteristics;
- quality;
- access;
- integrity.

The data dimension includes coverage, periodicity (i.e., the frequency of compilation), and timeliness (i.e., the speed of dissemination). The data dimension in the GDDS is closely linked to the quality dimension, within which plans for improving data quality form an integral part.

The data dimension is closely linked to the quality dimension, within which plans for improving data quality form an integral part.

The focus for the access and integrity dimensions is on the development of policies and practices in line with the objectives of dissemination of readily accessible and reliable data. Information on access and integrity of the data and, especially, the agencies that produce and disseminate them, is essential in building confidence of the user community in official statistics.

Among the principal potential beneficiaries of the e-GDDS are national statistical agencies, the users of data, and the providers of technical assistance. National statistical agencies can benefit by adopting the e-GDDS framework to systematically evaluate and improve their statistical systems in a comprehensive and prioritized way, across a broad range of data and statistical agencies.

Source: IMF's overview webpage on e-GDDS

Box C.6.6: IMF: Data Quality Assessment Framework (DQAF)

The IMF Data Quality Assessment Framework (DQAF) identifies quality-related features of governance of statistical systems, statistical processes, and statistical products. It is used for comprehensive assessments of countries' data quality. The DQAF is rooted in the UN Fundamental Principles of Official Statistics and grew out of the Special Data Dissemination Standard (SDDS) and General Data Dissemination System (GDDS), the IMF's initiatives on data dissemination. The DQAF incorporates their good practices and is the result of intensive consultations.

The DQAF provides a structure for assessing existing practices against best practices, including internationally accepted methodologies.

The DQAF's coverage of governance, processes, and products is organized around a set of prerequisites and five dimensions of data quality—assurances of integrity, methodological soundness, accuracy and reliability, serviceability, and accessibility. For each dimension, the DQAF identifies 3-5 elements of good practice, and for each element, several relevant indicators. Further, in a cascading structure, more detail and more concreteness tailored to the dataset are provided by focal issues and key points.

The generic DQAF serves as an umbrella for seven dataset-specific DQAF frameworks: National accounts statistics; Consumer price index; producer price index; Government finance statistics; Monetary statistics; Balance of payments statistics; External debt statistics. In addition, a DQAF module on household income in a poverty context has been developed in collaboration with the World Bank.

Source: IMF's overview webpage on DQAF

Box C.6.7: United Nations Statistics Division: National Quality Assessment Framework (NQAF)

The United Nations National Quality Assurance Frameworks Manual for Official Statistics (UN NQAF Manual) and its recommendations guide countries in the implementation of a national quality assurance framework, including new data sources, new data providers, and data and statistics of the Sustainable Development Goals indicators.

In recent years, new data sources, data providers and statistics producers have emerged, fuelled by technological advances and new demands for detailed and timely data for policymaking in the context of the 2030 Agenda for Sustainable Development. The NQAF Manual responds to the challenges and opportunities for official statistics posed by the new data ecosystem, which is characterized by the emergence of new data sources, new data providers and statistics producers.

The NQAF Manual and its recommendations are directed at assuring the quality of official statistics throughout the entire national statistical system, which consists of the national statistical office and other producers of a country's official statistics. It also provides guidance for engagement with statistics producers and data providers outside of the NSS that cooperate with members of the NSS in the production of official statistics. For example, the Manual addresses quality assurance in the use of different data sources and SDGs indicator data and statistics.

The NQAF quality principles and associated requirements consist of four levels, ranging from overarching institutional and cross-institutional management and statistical production processes to the outputs:

Level A: Managing the statistical system;

Level B: Managing the institutional environment;

Level C: Managing statistical processes;

Level D: Managing statistical outputs.

Each level contains a concise set of principles and requirements to guarantee quality in that aspect of quality assurance. These requirements are vital indicators that, when met, will ensure that provisions have been made to assure quality. In total, the NQAF comprises 19 quality principles and their associated requirements. The NQAF Manual also presents 14 recommendations for quality assurance that are mainly based on the UN Fundamental Principles of Official Statistics, identifying and clearly spelling out the responsibilities of the members of the NSS for assuring the quality of data and statistics.

Source: United Nations: United Nations National Quality Assurance Frameworks Manual for Official Statistics (UN NQAF Manual) (2019)

Various international resources support the wider evaluation of the quality of a country's statistics. A description of most NSSs can be found in the database 'Country profiles of statistical systems' on the United Nations Statistics Division's website. This database covers the history of the NSS, the legal basis for the statistical activities, the NSO and other data producers. It may contain the NSS's or NSO's activity report, the most recent data and publications. As such, it gives the basic structural information on the NSS, as discussed in section B.2.3.

For countries benefiting from Heavily Indebted Poor Countries Initiative (HIPC), the Poverty Reduction Strategy Paper (PRSP) and annual reports provide information on the timeliness of the strategy monitoring indicators that are appended to the annual reports. They can also contain information about the relevance of indicators and on the difficulties encountered in their preparation. The World Bank and IMF joint notes and reports on the PRS's evaluation (IMF and IDA Joint Staff Advisory note and Joint Staff Assessment of the PRS annual report) frequently offer elements for estimating an NSS's capacity to provide data for the follow-up of the PRS implementation.

Another source of information on the status of national data is the IMF's National Summary Data Pages (NSDPs). NSDP is a 'data portal' for countries participating in e-GDDS (or SDDS or SDDSplus), and gives access to data, metadata and links to online datasets for all available categories for a country, even if these categories are compiled by multiple statistical agencies. It provides detailed, systematic information about the availability and quality of national mostly economic data, as well as about plans for improvement. This is an important international source of information on economic data quality.

On the World Bank's Statistical Performance Indicators website, there is an SPI Data Portal that displays tables and graphs with the latest data and trends on statistical performance. It allows users to assess the performance of a single country or compare countries.

National self-assessment reports on the SDGs will typically contain analyses, many of high quality, on social data availability and quality.

The NSS as a whole may already have been analysed, perhaps as part of the preparation of a statistical strategy or plan, such as a National Strategy for the Development of Statistics (NSDS). The existence of an effective strategy or plan could reflect national government understanding of the role of statistics as a policy management tool. The PARIS21 webpage provides information on country NSDSs and other strategy papers, legal texts regarding statistics and other information related to NSS organisation. PARIS21 also coordinates and disseminates information collection concerning development assistance support for statistics. The application of NSDSs and other strategic analyses is discussed further in section C.7.1.

A clear picture may emerge from this investigation of the availability and quality of statistics in a sector or in the statistics system as a whole. The set of observations obtained can serve as a basis for discussion with the partner country about the need for a strategic development of institutional statistical capacities and the development of an NSDS.

C.6.3.3 QUALITY AND THE MODERNISATION OF OFFICIAL STATISTICS

In the past few decades, the processing, production and consumption of information has changed at a rapid pace. This applies in particular to statistical information. At the same time, there has been a large decrease in the resources allocated to official statistics. As a response to these developments, statistical offices have been looking for ways to make their practices and processes more efficient and flexible.

The modernisation of official statistics is a relevant approach to meet these new challenges, to provide an articulated path/framework to adapt statistical work to the new context and to be more reactive to changes. The research was launched by a community of statisticians, involving key actors such as Eurostat, the OECD and UNECE, but also national statistical organizations. There was a clear understanding among statisticians that the new challenges affected the whole community of official statistics and that pooling investments and efforts would help identifying the best practices and developing the most adequate answers.

The initial group of statisticians was progressively joined by others and, in 2015, organised itself under the 'High Level Group for the Modernisation of Official Statistics' (HLG-MOS), directly attached to the Conference of European Statisticians (CES). The group developed regular work programmes that mainly aimed at standardising statistical work in order to ease exchanges and to allow a mutually beneficial cross-fertilisation among statistical organisations. The HLG-MOS works on Human resources, organisational frameworks and evaluation; Statistical production, methods and information technology; Data collection and data sources; Dissemination and communication; and Standards and metadata. It is organised around four working groups: The group for supporting standards (develop, promote and support the implementation of statistics standards), the group on applying data science and modern methods (develop, promote and support the implementation of data science and modern methods initiatives needed for statistical modernization of business processes), the group on capabilities and communication (change management, building competencies) and the "blue skies thinking network" ("ideas factory").

The working group on standards developed several and interrelated tools that define today the way statisticians all over the world envisage their work and the collaboration among them and with partners in the statistical system.

First, there was a common acknowledgement that the way statisticians looked at the organisation of the statistical work had to be re-assessed: the traditional compartmentalization into sectors or topics didn't reflect a reality where operations and processes could be similarly designed and where sectors could learn from each other for the good of the whole system. There are different steps/phases that need to be followed to produce official statistics and defining a standard

methodology for these steps and their sub-processes (further level of detail) would greatly help the coordination within and among statistical organisations.

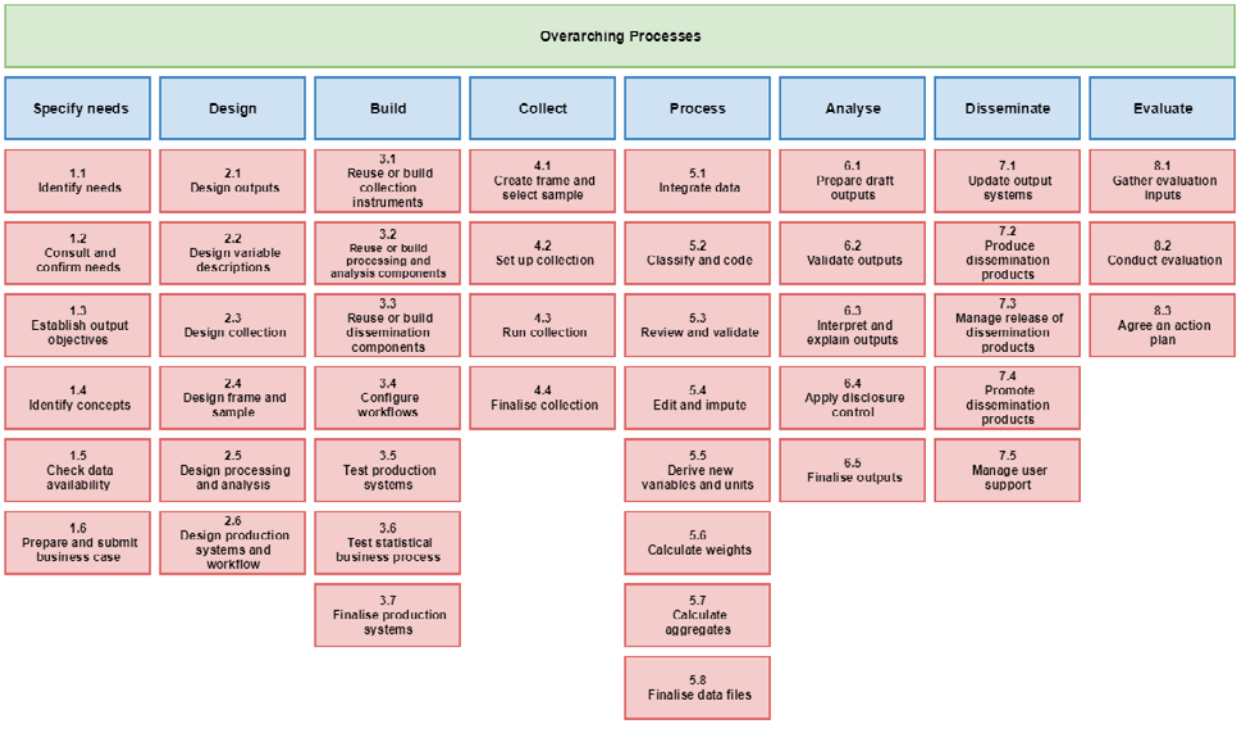
Building on earlier reflections and initiatives (in particular the "statistical value chain"), the methodology followed would aim at illustrating the statistical production process. The 'Introduction' to the GSBPM specification states that "The Generic Statistical Business Process Model (GSBPM) describes and defines the set of business processes needed to produce official statistics. It provides a standard framework and harmonised terminology to help statistical organisations to modernise their statistical production processes, as well as to share methods and components." An initial version of the tool was circulated among users in 2009 and was later revised/refreshed (Version 4.0 in 2013 and version 5.1 in 2019 — as the objective is standardisation and exchange, the tool is only revised (refreshed) at long intervals (5 years) and at the margin, priority being given to continuity). Today more than 50 statistical organisations around the world have implemented the tool and contribute to its promotion and regular improvement.

The GSBPM model is illustrated in Figure C.6.1 below. It comprises three levels:

- Level 0, the statistical business processes. This level covers Quality management; Metadata management; Data management; Process data management; Knowledge management; and Provider management.
- Level 1, the eight phases of the statistical business process: Specify needs; Design; Build; Collect; Process; Analyse; Disseminate; and Evaluate.
- Level 2, the sub-processes within each phase. They a subprocesses specific for each phase; for example, the phase 'Evaluate' has three sub-processes, while the phase 'Process' has eight sub-processes.

The content of the three levels is fairly detailed in the documentation developed by the HLG-MOS.

Figure C.6.1: The articulation of the three levels of the GSBPM



Source: Generic Statistical Business Process Model (GSBPM) website

The GSBPM applies to all activities undertaken by producers of official statistics, at both the national and international levels, which result in data outputs. It can be used to document any kind of statistical business process, from the more traditional survey to the administrative data acquisition or to the statistical compilation. The model should be seen as a reference (a check-list matrix) but which must be used with flexibility in order to adjust to the need of the organisation which uses it. It may cover the whole statistical work but also only concentrate on a few processes for which the organisation wants to initiate a discussion within its services or with another organisation. In addition, the analysis made through the tool is not linear and the analysis of processes may follow different paths along the sub-processes. The tool is thus useful in different ways: to manage the statistical programme of an organisation, to discuss cost and resource allocation within the organisation, to document statistical processes, to assess the quality of the work done or to share methods and practices.

Box C.6.8: GSBPM implementation: Israel and Mexico

Israel and the GSBPM

The model was one of the objects of the two successive twinning projects that the Central Bureau of Statistics (ICBS) implemented with Statistics Denmark (2013-2014 and 2016-2018) under EU funding. During the first project, an experimental mapping of statistical processes (GSBPM phase level) was realized that led to a growing interest for the tool by the management of the ICBS. Several staff members were then more intensively trained through courses and the participation in international meetings and workshops on the model. The second project was the occasion to translate GSBPM documentation into Hebrew, to launch a Pilot Quality audit review for five statistical processes using GSBPM and to adopt a quality assessment procedure for ICBS. The GSBPM was used as a management tool for the planning of the population census and to review the costs of most of the surveys carried out by ICBS.

Source: Best GSBPM practices, Israel Central Bureau of Statistics, presented by B. Attali and E. Dror at Eurostat's MEDSTAT IV training course on GSBPM in Rome, Italy, 25-27 July 2017

Mexico and statistical modernisation

The GSBPM 5.0 was approved by the National Institute of Statistics and Geography (INEGI) as a guideline for the preparation of the long-term strategic plan in May 2016. A committee was established to oversee the progress of the work and the GSBPM documentation was translated in Spanish. The local version of the tool used by INEGI covered eight phases and 44 sub-processes. Emphasis was put on making explicit the use of administrative registries, statistics generated in previous processes, non-traditional sources and on Including the production of both statistical and geographical Information. Compliance with international quality principles became standardized and explicit. Budget and costs management adopted GSBPM terminology and software applications got in line with GSBPM phases. The ruling of risk mitigation and assessment adopted GSBPM as a reference. As a consequence of all the above, a gradual but profound organisational transformation started at INEGI that with repercussions for the whole national statistical system.

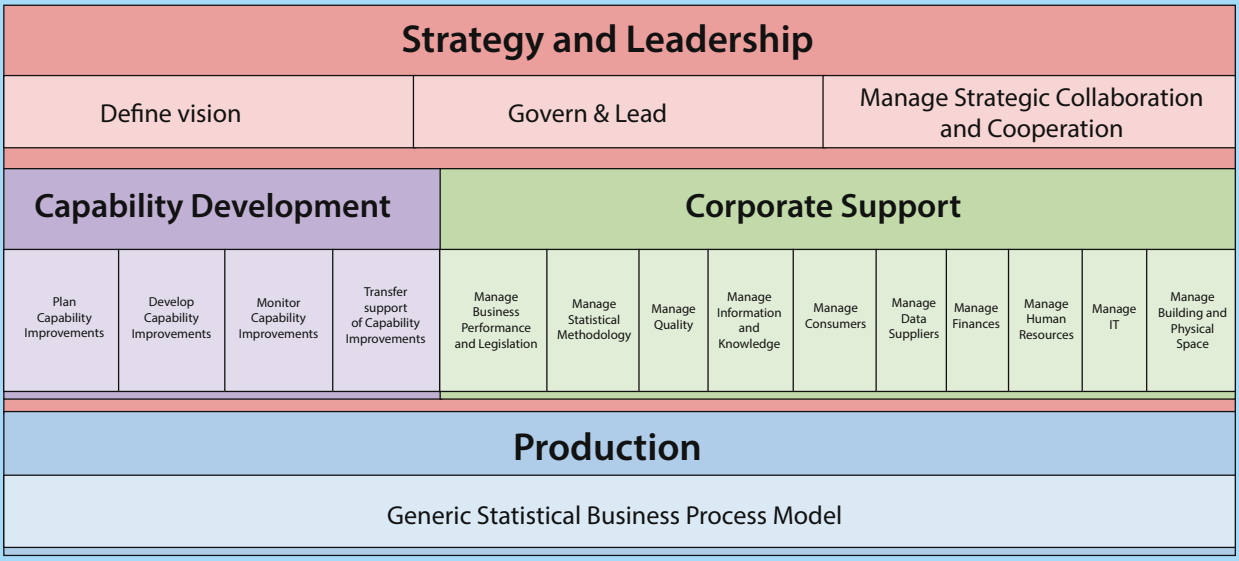
Source: Un marco para la modernización del INEGI, by J. a. Santaella, president of INEGI Mexico

With the experience acquired using GSBPM, it became obvious that a similar standardisation should be developed for the other activities of the statistical organisations and not only the ones related to the production of outputs. The HLG-MSO thus worked on a new tool that extends and complements the GSBPM. In the 'Purpose' of the GAMSO specification it is stated that "The Generic Activity Model for Statistical Organisations (GAMSO) describes and defines the activities that take place within a typical organisation that produces official statistics. It extends and complements the GSBPM by adding additional activities needed to support statistical production." An initial version of the tool was released in 2015 and a revision was carried out in 2019 (version 1.2).

GAMSO develops around four levels that are presented in Figure C.6.2 below. From bottom to top:

- The first level (Production) is already covered by the GSBPM,
- The second level covers activities that enable the organisation to undertake new activities, or to improve the efficiency of existing ones (such as research, development and innovation activities concurring to the development of capabilities). They are analysed according to four successive stages of realisation: plan capability Improvements, develop capability Improvements, monitor capability Improvements and transfer support of capability Improvements;
- The third level includes all the cross-cutting activities required by the organisation to deliver its work programme efficiently and effectively: Business Performance and Legislation, Statistical Methodology, Quality, Information and Knowledge, Consumers' management, Data Suppliers' management, Finances, Human Resources, Information Technology (IT) and Buildings and Physical Space;
- The fourth level addresses the high-level strategy of the organisation and its ability to deliver the products and the services demanded. It covers three main activities: Define Vision, Govern and Lead and Manage Strategic Collaboration and Cooperation.

Figure C.6.2: The four levels of GAMSO



Source: Generic Activity Model for Statistical Organizations (GAMSO) website

Box C.6.9: Uses of GAMSO

Some expected uses of the GAMSO are listed below. They show that the target audience for this model can vary according to use from top management to experts:

- As a basis for resource planning within a statistical organisation;
- As a basis for the measurement of costs of producing official statistics in a way that can be compared between organisations;
- As a tool to help assess the readiness of organisations to implement different aspects of modernisation, in the context of a proposed "Modernisation Maturity Model";
- To support risk management systems;
- To support the development and implementation of enterprise architectures, including components such as capability architectures;
- To help to measure and communicate the value of statistical modernisation activities across an organisation.

Source: Generic Activity Model for Statistical Organizations (GAMSO) website

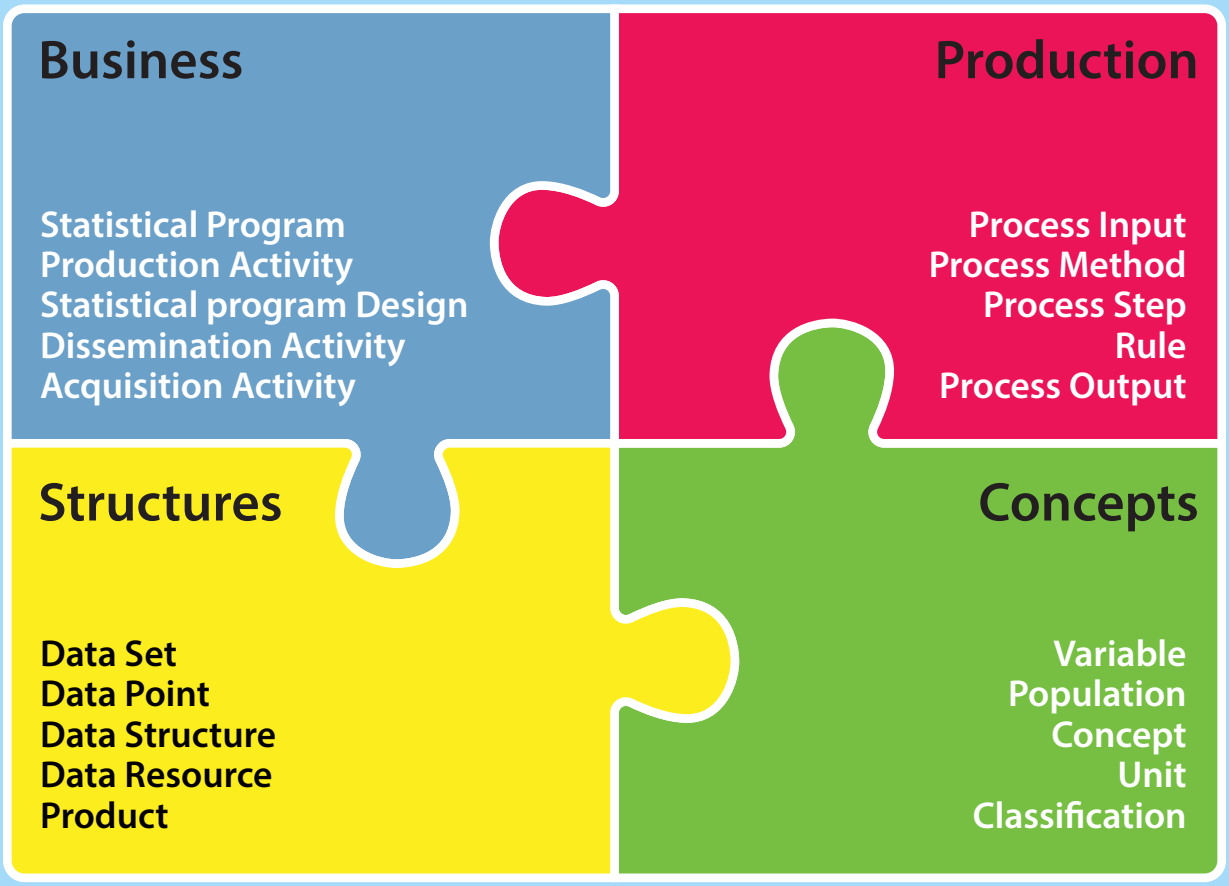
The HLG-MSO is also working on three other tools that are briefly discussed below:

- the **Generic Statistical Information Model (GSIM)**. The tool is the result of a strategic approach for a general description of the definition, the management and the use of data and metadata all along the statistical production process. It was first circulated in 2011 and then revised in 2013 and 2019. The current version is version 1.2. It provides a set of standardized, consistently described information objects (using a common language), which are the inputs and outputs in the design and production of statistics. GSIM identifies around 150 information objects, which are grouped into four top-level groups as illustrated in Figure C.6.3 below.

These four top-level groups are:

- Business group. It captures the designs and plans of statistical programs,
- Production group. It describes each step in the statistical process,
- Concepts group. It defines the meaning of data, providing an understanding of what the data are measuring, and
- Structures group. It describes and defines the terms used in relation to data and its structure.

Figure C.6.3: The four top-level groups of GSIM



Source: Generic Statistical Information Model (GSIM) website

- The **Common Statistical Production Architecture (CSPA)**. This tool was initially developed in 2015 as a reference architecture for the statistical industry, including application architecture and associated principles for the delivery of statistical services as well as technology architecture and principles (limited to the delivery of statistical services). Its aim is to contribute to a harmonized and integrated approach to service orientation within official statistics as to facilitate the sharing of experiences and to improve the relevance of the response of statistical organizations to the new challenges for statistics in the 21st century.

The common reference is based on existing standards and tools and in particular the GSBPM, the GSIM, Statistical Data and Metadata eXchange (SDMX) and Data Documentation Initiative (DDI) thus allowing modernising national statistical organisations while keeping/improving the compliance with international standards. The strengthening of the community of statisticians, speaking the same language and sharing the same vision for the architecture of the statistical systems, may certainly help as the 'shared SERVices' project, led by Eurostat and some of the National Statistical Institutes of the European Union proved. Recently, the HLG-MSO created a specific expert group, the CSPA Implementation Group, to foster the use of CSPA worldwide.

- The **Common Statistical Data Architecture (CSDA)**. The initial version of the tool was designed in 2017 and presented to the HLG-MOS. The need for such a tool has been created by the fact that, more and more, statistical organizations have to mobilise data form very diverse and multiple sources, which must be gathered and used in a standardised way.

Implementing the models presented above, and whatever are their respective levels of complexity, may bring a lot of benefits even in countries where the statistical system is not highly developed and articulated. Investing in standardisation may greatly help in the documentation of all the processes, making easier the identification of the weaknesses and of the areas in need of improvement. Being part of the community for statistical modernisation may also open large rooms for exchange with other countries, in particular those with more developed statistical systems, and bring benefits in terms of good practices, leading to better matching the demand from the users.

To find out more…

… about quality frameworks

- European Statistical System (ESS): Quality Assurance Framework of the European Statistical System – version 2.0 (2019)
- European Statistical System (ESS): ESS handbook for quality and metadata reports (re-edition 2021)
- UN Statistics Division: United Nations National Quality Assurance Framework (UN NQAF) and the United Nations National Quality Assurance Frameworks Manual for Official Statistics (UN NQAF Manual) (2019)
- OECD: Quality Framework for OECD Statistical Activities
- IMF: Enhanced General Data Dissemination System (e-GDDS) (2015)
- IMF: Data Quality Assessment Framework (DQAF) (2012)
- International Organization for Standardization: ISO 9000 family of quality management standards (documentation standards)

… about documentation of statistical systems, containing quality information

- UN Statistics Division: Country profiles of statistical systems
- World Bank: Statistical Performance Indicators, Measuring the Statistical Performance of Countries: An Overview of Updates to the World Bank Statistical Capacity Index (technical note) and SPI Data Portal
- PARIS21: Statistical Capacity Monitor
- IMF: National Summary Data Pages (NSDP)
- PARIS21: Knowledge database with information on statistics systems and NSDSs
- Eurostat: EU candidate countries and potential candidates: Peer reviews, light peer reviews, sector reviews and adapted global assessments and European Neighbourhood Policy (ENP) countries: Global assessment reports, light peer reviews and sector reviews

… about quality and the modernisation of official statistics

- UNECE/CES, Eurostat and OECD 'Meeting on the Management of Statistical Information Systems (MSIS 2008): Metadata use in the statistical value chain – the Eurostat case, invited paper by G. Pongas and A. Wronski (Eurostat)'
- High-Level Group for the Modernisation of Official Statistics (HLG-MOS): working areas Human resources, organisational frameworks and evaluation; Statistical production, methods and information technology; Data collection and data sources; Dissemination and communication and Standards and metadata.
- Conference of European Statisticians (CES)
- Generic Statistical Business Process Model (GSBPM)
- Generic Activity Model for Statistical Organisations (GAMSO)
- Generic Statistical Information Model (GSIM)
- Common Statistical Production Architecture (CSPA)
- Common Statistical Data Architecture (CSDA)
- Statistical Data and Metadata eXchange (SDMX); SDMX on Eurostat's website
- Data Documentation Initiative (DDI)
- Eurostat's ESS.VIP project 'shared SERVices': ESSNet Sharing common functionalities in ESS

C.6.4 Looking at the National Statistical System as a whole

The analysis of the national statistical system and of its data quality may have revealed a number of problems. For example, it may be that no relevant data exist, or that existing data are of poor quality, out of date, or even that data exist but have not been disseminated. Any such problem justifies an intervention to strengthen the statistics in the sector concerned. Data may well be required for evidence-based policy making in the sector at national level.

As underlined by the Evaluation of European Commission support for statistics in third countries 1996-2005 (2007), the effectiveness of projects that support statistics and the sustainability of their results increase when:

- interventions are anchored in the overall development strategy of the partner country.
- the projects are conceived within the global context, considering the NSS as a whole. They should be identified on the basis of the statistical situation and the information needs, thus focusing on the demand for information by users, particularly by decision-makers. Ideally, the priorities should be defined in the National Strategy for the Development of Statistics.
- activities promoting a culture of evidence-based decision-making are systematically included, throughout the design and implementation of the intervention, such as the production of material which advocates statistics. All such material should be transferred to the statistical system managers after the project for further use.
- specific measures are drawn up to involve all users and not only the staff of the NSO. This goes beyond pure information and may include specific seminars to help users understand the data and develop confidence in their accuracy, reliability, and integrity.

- the focus of assistance is more on strengthening the capacity of the NSS as a whole (and not only the NSO) to regularly produce reliable basic data rather than on supporting a particular survey or study. This should then enhance the quality of statistical data and indicators.
- a policy dialogue accompanies statistical support to prepare the phasing out of the project. This should include foreseeing whether the partner government or another donor will take over the funding after the end of the intervention.
- the status of the NSS as well as the human and financial resources available are taken into consideration: statistics are not only an instrument but an integral part of the architecture of public services.
- the personnel that worked on the statistical project can continue and transmit their know-how to others within the NSS. The sustainability of human resources is linked with financial sustainability. Insecurity regarding longer term funding as well as delays in funding can lead to a substantial 'brain drain' from the statistical institutes to the private sector.

The need for and benefits of an integrated approach to the development of statistics, both with respect to the overall development strategies and with respect of strengthening the capacity of the statistical system as a whole, is at the heart of chapter C.7.

To find out more…

- European Commission, DG International Partnerships: Managing a project
- Evaluation of the Commission Support for Statistics in Third Countries (2007)
- PARIS21: National Strategy for the Development of Statistics (NSDS), including NSDS Knowledge Base containing national NSDS documents and other relevant reference documents, NSDS Status Reports, an NSDS Self-Assessment Evaluation Tool, the NSDS Guidelines and the presentation brochure 'NSDS 2.0 in a nutshell'
- PARIS21: Promoting Statistics website, including the toolkit 'Advocating for the National Strategy for the Development of Statistics'
- United Nations Statistics Division: Handbook on Management and Organization of National Statistical Systems

C.7 How to bring assistance to statistics

C.7. How to bring assistance to statistics

The chapter in brief

This chapter provides guidance at the decision phase on whether and how to give support to statistics. It discusses the relationship between statistics strategies and national development and poverty reduction strategies and analyses the development and implementation of statistics strategies. This is followed by a presentation of capacity development in statistics, including how it is related to statistical strategy documents and practical considerations.

Having looked at what is to be done, the chapter then moves on to examine in general how statistics actions should be carried out. The issues of coordination at various levels are addressed: who can do what and what needs to be done to ensure coherence and eliminate duplication?

C.7.1. Statistical strategy

C.7.1.1 WHY A STATISTICAL STRATEGY?

The aim of any statistics intervention is to support the collection and dissemination of statistics that inform development policy. National development policies are usually integrated in a strategic framework, such as a national development plan or a poverty reduction strategy. Informing national and sector development strategies through assessment frameworks to monitor progress has been a central commitment since the adoption of the Paris Declaration on Aid Effectiveness in 2005. The assessment frameworks include performance indicators that need to be coherent between policy sectors and consistent over time. These performance indicators are largely based on publicly available statistics, which must be coherent in the same way. A policy level strategy is needed to ensure that quality statistics are disseminated regularly and are attuned to policy requirements, are affordable, are comparable over time and are consistent between sectors.

A statistical strategy is expected to provide guidelines to strengthen the statistical capacity of the National Statistical System (NSS). It therefore needs to show which statistics will be collected and published and how this will be implemented. It also needs to identify the financial, human, and technical resources that will be available to the NSS. It needs to analyse the constraints the NSS faces: issues of the legal framework; budget and finance; institutional coordination; physical resources; and human resources – staff numbers, skills and commitment. Similarly, it needs to address how the NSS will publish quality statistics (see section C.6.3. for analysis of quality in statistics).

The core element of the statistics strategy is its vision of the medium-term objectives of the statistics system: which statistics will be produced, how and with which resources, and the links of these statistics with the demand for data to monitor policy progress. An action plan, often covering a five-year period, which demonstrates how the strategy will be fulfilled, is generally part of the strategy. The role of the statistics strategy in informing national policies as well as the need for commitment of resources means that the statistics strategy is an explicitly political document and thus requires authorisation and active participation from decision makers.

In order to be effective, statistics strategies should be based on and consistent with national strategies and planning; the national budget, poverty reduction strategy and sector policy monitoring frameworks should be seen as the starting points for defining both the minimum indicator set and the estimated budget for statistics. This will enable statisticians to be exposed to concrete examples of how data are needed and used by policy makers and will ensure that strategies are owned by both statisticians and users of statistics.

Since staff numbers, skills and motivation are the key elements in producing statistics and salaries are the largest cost of producing statistics, a good statistics strategy will include a clear, detailed description of the human resources requirements.

Box C.7.1: Action points for statistics strategies

- Statistics strategies must be demand-driven, moderate and realistic and must build on existing processes;
- Statistics strategies should take a realistic approach to results-oriented management, focus on key indicators and take into account limited national capacity and resources;
- Strategies should focus and harmonise donor support on country statistics priorities;
- Implementation of strategies should be monitored.

C.7.1.2 NATIONAL STRATEGIES FOR DEVELOPMENT OF STATISTICS

The most common methodology for developing a statistics strategy is the National Strategies for the Development of Statistics (NSDS), supported by the PARIS21 consortium. The particular strength of this methodology is its recognition that the statistics strategy is a policy document. Advocacy at the political level plays a prime role in PARIS21's approach.

The NSDS is a planning approach for the strategy elaboration in order to develop capacity to produce, disseminate and mainstream the use of statistics. It is in line with a country's national development plan and other international and regional data requirements and guided by the principles of inclusiveness, transparency, and accountability.

The NSDS normally covers a five- to ten-year planning period, ideally coinciding with the planning period of the national development plan. The NSDS should provide the country with a strategic vision for developing its statistical capacity across the whole national statistical system (NSS). The NSDS process follows a results-based, stage-phase-step approach in designing the strategy. Through its inclusive approach, it helps enable collaboration and coordination between stakeholders. After the creation of an NSDS action plan, evaluation reports are used to assess the status and progress of the country's NSDS.

Box C.7.2: An effective National Strategy for the Development of Statistics ...

- has high-level political support;
- is mainstreamed within national development policy processes, building on what is already available;
- is the output of a nationally led, nationally owned and inclusive participatory process that draws on international standards, recommendations and experience;
- provides the basis for the sustainable development of statistics with quality "fit for purpose";
- assesses the current status of the national statistical system and provides a vision and a strategic plan for national statistics;
- sets out an integrated statistical development programme that is flexible enough to cope with change;
- outlines the financing requirements, but is realistic about resource needs;
- serves as a coherent framework for international support for statistical development.

Source: Managing for Development Results "Statistics: Better Data for Better Results" (2007)

Box C.7.3: Why is there a need for a National Strategy for the Development of Statistics?

- The NSS faces increasing data demands from the National Development Plan in addition to regional and international agendas. This increase has created a data ecosystem transcending the NSS and expanding the number of data producers and users. The NSDS provides leverage to overcome these challenges.
- Policy makers need statistics for evidence-based decision-making. Indeed, official statistics provide a clear picture of the country's strengths and challenges. The NSDS represents a tool in order to organise and coordinate the statistics value chain to prepare, monitor and evaluate a National Development Plan as well as other policies.
- Bilateral and multilateral assistance organisations need comprehensive and clear information on the NSSs regarding their specific challenges, goals and budget in order to prioritize their funding and their technical support. The NSDS informs them on the priority areas for partnership and collaboration in capacity development and resource mobilization for official statistics.
- Other data producers in the data ecosystem need better coordination in order to avoid duplications of work and contradictions in concepts and definitions. The new data producers underscore emerging issues in terms of new data sources (Big Data, Citizen-Generated Data, Geospatial data etc.), procedures and methods (privacy, ethics, standards) and skills. The NSDS responds to the data production ecosystem by offering a producer-producer dialogue. The process brings all stakeholders together and allows a better coordination and planning of the production itself as well as its underlying issues.
- Other data users (citizens, civil society, academia and media) need official statistics for different purposes. On the one hand, the NSDS process constitutes a platform for them to voice their needs and concerns through a user-producer dialogue. On the other hand, the final NSDS contains all the information on new and improved data as well as statistical products and services to be expected.

Source: PARIS21: NSDS Guidelines

The timeline for the preparation of the NSDS varies across countries and regions. It depends on management and technical capacity, experience and commitment of the national statistics office to coordinate and motivate stakeholder participation and support, and the current policy plan within the development outlook of the country. In practice, based on experiences in a large number of countries over recent decades, the NSDS process from preparation, consultation, and validation to approval and endorsement of the NSDS strategic framework and action plans takes on average up to 6 months in Small Island states, 6-12 months in Asia, and 6-18 months in Africa.

It is vital that the NSDS is deeply rooted in the institutions involved. It is important that all institutions and structures with an interest in the statistical strategy participate in its elaboration, creating a common ownership of the NSDS and thus increasing commitment to the strategy. The development should be in the hands of the members of the NSS, operating under active political direction and support. When external consultants support the design of the NSDS, it is important to ensure that the strategy remains rooted in the national demands for published statistics and the perceptions and possibilities of the NSS, as well as maintaining political backing. It is important that the NSDS is written in such a way that the people who will be responsible for its implementation can relate to it.

The PARIS21 documentation clearly states that there is no uniform template for an NSDS and therefore there cannot be a uniform set of terms of reference for its development. PARIS21 developed the first NSDS Guidelines in 2004. Since 2014, PARIS21 updates the NSDS Guidelines annually; thus, for the most recent version, please consult the PARIS21 NSDS Guidelines website.

Box C.7.4: The Principles of the European Statistics Code of Practice, 2017 revision

Stage	Phase	Step
A. Preliminary stage	1. Engaging stakeholders	1.1. Policy document 1.2. NSDS Roadmap 1.3. Advocacy programme and toolkit
	2. Preparing	2.1. Appoint teams 2.2. Launch NSDS development process 2.3. Organise NSDS training workshop
B. Design stage	3. Assessing the NSS	3.1. Assess NSS capacity 3.2. Assess output & services 3.3. Assess data needs 3.4. Prepare & validate NSS report
	4. Envisioning & identifying strategic goals	4.1. Develop vision, mission & values 4.2. Identify goals & strategies 4.3. Validate the NSDS strategic framework
	5. Elaborating action plans	5.1. Preparation & costing 5.2. Elaborate funding strategy 5.3. Evaluate risks & prepare strategy 5.4. Design the M&E framework 5.5. Prepare & validate the NSDS document
C. Deployment stage	6. Implementing & monitoring	6.1. Disseminate NSDS document 6.2. Mobilise & implement NSDS 6.3. Implement NSDS action plans 6.4. Monitor and report on progress 6.5. Update & validate 6.6. Conduct mid-term review 6.7. Revise goals, plans & budget
	7. Evaluating	7.1. Prepare final evaluation 7.2. Conduct final evaluation 7.3. Evaluation approval & dissemination

Source: PARIS21's NSDS Guidelines 3.0 – NSDS Lifecycle

A key quality action is to let the NSDS be reviewed by independent peers. Not only are the independent peers ideally placed to critically assess presumptions and priorities; they are also able to bring in their experience and fresh views and ideas to the national NSDS process. PARIS21 produces methodological guidance on strategic planning and assists countries in finding solutions to obstacles. This includes helping countries setting up peer reviews of their NSDS, giving the opportunity to get an independent view and assessment of the NSDS and sharing the experiences of more advanced countries in strategic plan development and follow-up.

Peer reviewing is a central part in the quality work of the European Statistical System (ESS), where Member States' compliance with the ESS Code of Practice is reviewed. Indeed, through the Pan-African Statistical Programme (PAS), Eurostat has supported the African Union in developing the methodology and approach for peer reviews of African National Statistical Offices (NSOs) and NSSs, as well as in the implementation of the peer reviews.

Box C.7.5: NSDS status in International Development Association (IDA) countries (as of January 2023)

	Currently implementing a strategy	Currently designing a strategy or awaiting adoption	Strategy expired or absent but currently planning an NSDS	Strategy expired or absent and not planning one	TOTAL
Africa	25	3	10	2	40
Asia and Pacific	16	1	5	4	26
Eastern Europe	1	0	0	0	1
Latin America and Caribbean	0	1	4	3	8
TOTAL	**42**	**5**	**19**	**9**	**75**

Source: PARIS21's NSDS Status Reports (January 2023)

To find out more…

about National Strategies for the Development of Statistics:

- PARIS21: Guidelines for National Strategy for the Development of Statistics (NSDS) (web version — updated annually)
- PARIS21: NSDS documents and examples
- PARIS21: NSDS Status Reports
- PARIS21: Guide to Drafting a Roadmap for Designing the National Strategy for the Development of Statistics – key summary document (2005)
- PARIS21: Guidelines for developing statistical capacity: A roadmap for Capacity Development 4.0 (2020)

about peer reviews on National Statistical institutes and National Statistical Systems:

- European Statistical System: Monitoring implementation of the ESS Code of Practice — peer reviews
- Pan-African Statistics Programme (PAS): Training on the African version of the Snapshot tool for assessing the quality of national statistics systems (2017)
- Pan-African Statistics Programme (PAS): Proposed methodology for peer reviews on NSIs/NSSs in African countries (2016)
- Eurostat and African Union: Peer reviews of National Statistical Institutes and National Statistical Systems in African countries, leaflet (2017)
- Mohamedou, E., Baredes, B., Tejada, G., Matthiessen, J.: Improving national statistical systems: The role of peer reviews, PARIS21 Discussion Paper No. 16 (2019)

C.7.2. Capacity development in statistics

C.7.2.1 WHAT IS CAPACITY IN STATISTICS?

In the European Commission – DG International Partnerships (EuropeAid's) concept paper 'Institutional Assessment and Capacity Development: Why, what and how?' (2005), capacity is defined as:

> *'Capacity can be defined as the ability to perform tasks and produce outputs, to define and solve problems, and make informed choices.'*

The OECD / DAC Task Force on Capacity Development (2004) defined capacity as:

> *'Capacity is the ability of people, organisations/institutions and society as a whole to successfully manage their affairs. Capacity development is the process of unleashing, conserving, creating, strengthening, adapting and maintaining capacity over time.'*

A country's statistical capacity can be defined as the ability of statistical producers to fulfil their mission of collection and dissemination of reliable and up-to-date statistics that meet users' needs. Statistical capacity development is the process whereby these bodies create and strengthen their statistical capacity. This process can be summarised as 'human', 'technical' and 'organisational' capacity development. Training is an important aspect of capacity development, given the importance of technical and managerial knowledge in organising statistics operations.

Another vital aspect is the appropriate information and communication technology (ICT), both with respect to the hardware and the required software applications. Furthermore, in order for a statistical process to be efficient and sustainable, the necessary organisational framework must be in place; this involves not only the legal framework, but also the support of and cooperation with other actors, such as line ministries, holders of administrative information, business federations and key enterprises, key statistics users, and so forth.

Box C.7.6: PARIS21: What capacity do we need?

"The understanding that good-quality statistics depend upon an infrastructure of properly financed organisations, an effective legal and political mandate and well-trained and managed technical and professional people is well known and not new. In the past though, efforts at developing statistical capacity have tended to focus mostly on technical concerns, such as survey design and data management. Where both financial and technical support has been provided, it has often emphasised data production, particularly in areas that are seen as important by development partners. A new approach is needed.

One problem affecting our delivery of capacity support is the narrow way in which the capacity of national statistical systems is assessed. Statistical assessments are traditionally focused on skills for statistical production processes, quality assurance and codes of conduct; or dimensions such as legislation, principles and institutional frameworks. Yet technological change, the emergence of new data providers and users, and the increasing complexity of the data ecosystem are calling for new skills and organisational practices. Soft skills, such as management and leadership, are increasingly important across statistical organisations, and we need to do better at understanding the incentives and political dimensions behind capacity delivery. Understanding the motivation for partners and beneficiaries to participate can make programmes more relevant and sustainable."

Source: PARIS21: Statistical Capacity Development Outlook, 2019

Capacity development 4.0

The new ecosystem for statistics that is emerging from the rapid changes in the way information (including statistical information) is produced, exchanged, and used, brought new concerns about the ability of statistical organisations to match the requirements and demands from their customers in terms of content, format, and media. The measurement of the Sustainable Development Goals (SDGs) is very representative of the changes in the ecosystem for statistics: The related impact it has, particularly on the way statistics are gathered (multiple sources, some of them non-statistical) and analysed/shared (multiple partnerships and multiple levels of analysis), generated new needs for statistical capacity development that translated into a new and more comprehensive approach based around the notion of "capabilities".

In 2018, the 'UNECE Statistical capacity development strategy' used a quote from the Open Group Architecture Framework v9.1 to define the concept of 'capability' in connection with statistical organisations

> *"A capability is defined as the 'ability that an organisation, person, or system possesses – capabilities typically require a combination of organisation, people, processes, and technology to achieve'. Capabilities are things that an organisation does, or needs to do."*

This new approach covers seven dimensions that are presented in the box below. To build a capability requires to address several of these dimensions while some may not be relevant in all cases. From this analysis, statistical organisations such as the UNECE and PARIS21 developed frameworks to help countries assess and improve their capabilities. These frameworks usually start with an assessment of the statistical system in order to identify strengths and weaknesses and to target efficiently support and reinforcement.

Box C.7.7: UNECE: Developing capabilities

In the past, UNECE statistical capacity development has focused mainly on providing training workshops. These were mostly related to specific subject-matter domains. In this way, the focus was more on people than on the organisation. In view of the new challenges identified above, and particularly the demands related to producing statistics for SDGs, a new, more holistic approach is needed. This requires a strategy that considers all aspects of the organisation, and targets support and development where they are most needed.

One reason for not just focusing on training people is that some statistical organisations struggle to pay a competitive salary, and hence have a high staff turnover. Training people can therefore have a limited impact. Whilst training of people will still be needed, it should be undertaken in combination with ensuring that the organisation is sufficiently equipped in terms of methods, technology, processes, information. and standards, whilst ensuring a suitable institutional framework is in place.

Source: UNECE Statistical capacity development strategy (2018)

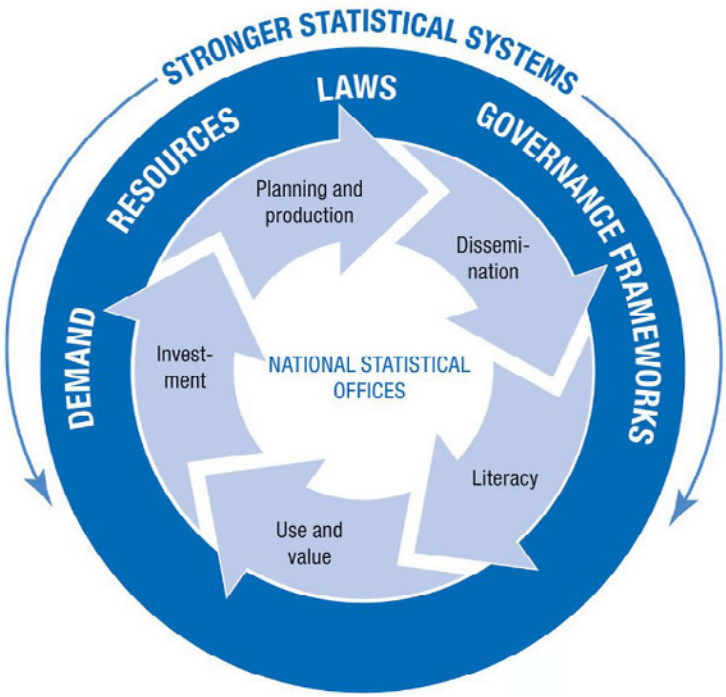
Strategy and priorities for capacity development

In 2015, PARIS21 organised a quick survey with NSOs in Africa, Latin America and Asia asking questions related to the priorities for capacity development. Questionnaires were sent to investigators from NSOs; most of this analysis was based on a sample of 25 NSOs. This exercise, even if not exhaustive, allowed to identify key issues of great concern for the statistical organisations interviewed. Among these concerns were the following: the poor coordination within the NSSs (including both the coordination among the data providers and the coordination with the users), the low level of investment in people and skills development (to master new issues, tools and practices), the weaknesses in the area of data dissemination and use, the limited use of the power of ICT, the limited capacities in the design and management of the statistical process and setbacks in the delivery of Aid in statistics (generally aligned with national priorities, but is not always delivered in line with a system-wide approach). These conclusions echo the findings of an earlier study entitled 'Evaluation of the Implementation of the Paris Declaration: Thematic Study – Support to Statistical Capacity Building, Synthesis Report', OPM (2009):

> *"The recommendations of the evaluation emphasise the need for ownership, harmonisation, alignment, mutual accountability, and managing for results. These are not surprising recommendations: they echo international agreements in the Paris Declaration and at the Marrakech Roundtable on development results, amongst other places. The problem is that these agreements are currently not always respected. In order to improve support to statistics, they must be respected."*

They are also corroborated by the latest recommendations and guidelines proposed by PARIS21 in its Road Map for capacity development 4.0 (see box C.7.8 below).

Box C.7.8: The virtuous circle of capacity development



Source: PARIS21: Statistical Capacity Development Outlook, 2019

How to support statistics capacity strengthening?

The ideal framework for planning capacity development is a sector-wide statistics strategy such as an NSDS. This will lead to capacity development actions being planned as part of the strategy implementation. In other situations, such as existing stand-alone sector programmes with a statistics component, the programme planning should ensure that the capacity will be available when it is needed. Building an effective NSS takes a long time. Commitment to medium-term support for strengthening statistical capacity is required both from the country's decision makers and from its aid partners.

The alternative strategy is to include statistical capacity development within each sector and in particular linked with major surveys. The advantage is that the focus can easily be placed on the role of statistical information within the sector. The disadvantage is that there is less impetus for the construction of a coordinated NSS.

In general, the generic chapter on Institutional Capacity Assessment of DG International Partnerships / EuropeAid's Project Cycle Guidelines is highly relevant to statistics. In Africa, the 'Strategy for the Harmonization of Statistics in Africa 2017-2026' (SHaSA 2) was jointly developed by the African Union Commission (AUC), the African Development Bank (AfDB), the African Capacity Building Foundation (ACBF) and the United Nations Economic Commission for Africa (UNECA), with support by the Regional Economic Communities (RECs) and the AU member states, responding to the needs of the African Statistical System (ASS) to support the implementation of the African Union's "Agenda 2063: The Africa We Want", the AfDB's High Five transformational agenda for Africa for 2015-2025 and the UN's "Agenda 2030 for Sustainable Development". The SHaSA 2's Strategic theme 3 is specifically to "Develop sustainable institutional capacities of the African Statistical System", including the strategic objectives to Reform and enhance NSSs; Reform and enhance regional and continental statistical systems; Develop sustainable statistical capacities; and Establish an effective technological environment. The SHaSA 2 can give a good idea of the central components of a comprehensive statistics capacity development programme.

Box C.7.9: PARIS21: Guidelines for developing statistical capacity: A roadmap for Capacity Development 4.0

Statistical activities are no longer produced exclusively by designated official statistics organisations. The expansion of technologies has empowered new actors who traditionally lacked the capacity and resources to embark on data collection, analysis, and dissemination. Private companies, civil society organisations and citizens themselves are emerging as data providers, thus blurring the lines between user and provider.

NSSs need to be strengthened on three levels: System (there is an urgent need for better coordination inside and outside the NSS), Organisation (Strategic planning, coordination, monitoring and evaluation inside the NSO, as well as well-targeted human resource management and transparent statistical production processes, are all crucial for producing high-quality data) and Individual (Next to training staff in the quantitative skills needed for data production, analysis and dissemination, NSSs should also aim to build communication, negotiation and leadership skills).

Source: PARIS21: Guidelines for developing statistical capacity: A roadmap for Capacity Development 4.0 (2020)

Measuring progress made in capacity development

The key issue when considering statistics capacity development is ensuring that the action under consideration is likely to make a significant practical difference to statistics operations. The progress made may be assessed through "comprehensive" systems, covering the whole statistical system such as the World Bank's Statistical Performance Index (see box C.7.10 below) or through more targeted methods focusing on one or a limited number of dimensions of statistical capacity (skills of the human resources, availability and use of IT tools, running of surveys or censuses, level of compliance with international norms and methods …) or on one or a limited number of topics (capacities for poverty measurement, for macro-economic statistics, for social statistics …).

There are plenty of tools to assess the capacity and quality of statistical systems. But what transpires from recent studies is the fact that only partial assessment is generally made of statistical capacities, focusing on aspects that statisticians master best (methodologies, resources and tools, institutional framework) and leaving aside new concerns that are linked to the mobilisation of non-statistical sources and the setting-up of partnerships with new actors, providers as well as users of data. Again, the measurement of the SDGs has triggered new needs for information that cannot be matched by official statistics alone: there is a crucial need to consider the statistical ecosystem within a larger perspective, building on multiple partnerships at local, national, regional and international level. Building statistical capacities more and more requires to open and share methods, tools and processes.

Box C.7.10: World Bank: Statistical Performance Indicators and Statistical Performance Index

The Statistical Performance Index (replacing the earlier Statistical Capacity Index) is a composite indicator measuring the capacity and maturity of the NSS of over 170 countries. It is based on a diagnostic framework which identifies five pillars of statistical performance, which 'break down' into 22 dimensions and 51 indicators. The values of the indicators are combined to compute the Statistical Performance Index (SPI).

The five pillars are the following:

- **Data Use:** Statistics have value only if they are used. A successful statistical system produces data that are used widely and frequently.
- **Data Services:** A range of services connects data users to producers and facilitate dialogues between them, thus building trust and adding value to data.
- **Data Products:** The feedback systems between data producers and data users drive the design and help increase the range of statistical products available, and can help improve their accuracy, timeliness, frequency, comparability, and levels of disaggregation. The availability and quality of key NSS data products signal whether countries can produce indicators needed to measure progress toward the 17 Sustainable Development Goals.
- **Data Sources:** To create useful products, a statistical system needs to draw on sources inside and outside the government. Modern data collection thus goes beyond the typical censuses and surveys to include administrative and geospatial data, as well as data generated by private firms and citizens.
- **Data Infrastructure:** A mature statistical system has well-developed institutional infrastructure (legislation, governance, standards), soft infrastructure (skills, partnerships), and the financial resources to deliver useful—and widely used—data products and services.

Source: World Bank: Statistical Performance Indicators - Learn about the SPI

Box C.7.11: Measuring Statistical Capacity Development: a review of current practices and ideas for the future – moving towards Statistical Capacity 4.0

The review paper discussed in this box provides evidence on what 14 of the most referenced assessments of statistical capacity aim to measure, and how they do so by comparing them with the dimensions of the PARIS21 Capacity Development 4.0 (CD4.0) framework.

The starting point of the analysis was the absence of a systematic approach to defining capacity as a basis for designing assessments and capacity development programmes. There have been criticisms in the past of the way in which statistical capacity is conceptualised in international assessments – there is a tendency to emphasise activities and outputs, while neglecting the utilisation of capacity. There are two main consequences of this lack of a systematic approach: the first is a proliferation of assessments by international organisations. This places a significant response burden on countries – paradoxically constraining those with low capacity even further. The second is the repetition of topics, areas, and even indicators/questions across many of the assessments. The majority of them focus solely on the most tangible aspects of capacity (mainly methodology, resources and statistical laws).

Source: PARIS21: Measuring Statistical Capacity Development: a review of current practices and ideas for the future – moving towards Statistical Capacity 4.0 (2018)

Financial and supporting instruments for capacity development in statistics

Most donor interventions in statistics aim at sustainability and therefore contain an element of capacity development. This should be the case even when the support provided is for a statistics operation, such as a population census or a household survey, and not directly aimed at increasing statistics capacity.

In the OECD's Development Co-operation Report 2017, the chapter on ' Rethinking donor support for statistical capacity building' specifically considers support for strengthening of statistical capacity in partner countries:

> *"Investing in data brings returns. Development data are critical for policy making, planning, and monitoring and measuring impact nationally and globally. Yet statistical systems in developing countries are often under-resourced and understaffed and traditional support to statistical capacity development is not fit for purpose. While political support to have and use more and better data is essential to realising the full potential of data for development, donor support needs to be increased, more effective and better coordinated by creating, for example, compacts for a country-led development data revolution."*

Building on the heritage from the Marrakech Action Plan for Statistics (MAPS) and of the Busan Action Plan for Statistics (BAPS) (see section B.1.2.1), the United Nations (UN) Cape Town Global Action Plan for Sustainable Development Data (see section B.1.3.3) identified key actions that had to be undertaken under six strategic areas: coordination and leadership (role of the statistical office in the national statistical system and coordination at national, regional and international level), innovation and modernisation of NSSs (governance, standards and technology), strengthening of basic statistics (social statistics, registers national accounts, geospatial data …), dissemination and use of data, multi-stakeholder partnerships (mobilisation of new sources of data, strengthening the relations with the users) and resource mobilisation (action plan and mix of national and external funding).

In a recent study entitled 'Financing challenges for developing statistical systems: A review of financing options', commissioned by PARIS21 and funded by the Swiss Development Cooperation, a group of experts estimated what would the implementation of the Cape Town Action Plan cost under three scenarios: low ambition (production of the SDG indicators), medium ambition (SDGs indicators and capacity development) and high ambition (funding of all the objectives of the Cape Town Action Plan). The estimated costs ranged from 2.9 billion USD per year for the low ambition scenario to 5.6 billion USD for the high ambition scenario.

Box C.7.12: OECD data for development – Rethinking donor support for statistical capacity development

Priority steps in rethinking donor support for statistical capacity development:

- Raise the profile of data for development at the highest political level.
- Treat data for development as a cross-cutting priority, viewing it as both a key means of achieving the SDGs and as an integral goal in itself.
- Revitalise support to development data; acknowledge the need for building the statistical capacity of partner countries.
- Increase domestic, international and private support for statistics and align support with national statistical plans and priorities.
- Ensure that strengthening of national systems is country driven.
- Focus on data use and users, as well as on dissemination and format.
- Establish coordinated and effective donor support for development data; build partnerships and cooperation.
- Increase the use of new funding mechanisms with a result-based focus.
- Improve monitoring, tracking and transparency of investments in development data.
- Contribute to the 2030 Agenda by supporting preparations for the 2020 census round.

Source: OECD: Development Co-operation Report 2017 – Rethinking donor support for statistical capacity development

There are several programmes from international, regional and bilateral donors directed at bringing support to capacity development. Around 2020/2021, several new programmes are being launched, such as the World Bank's new Global Data Facility (GDF) and the Bern Network on Financing Data for Development (Bern Network). These programmes partly filled the void created by the expiration of previous programmes such as TFSCB and SRF-CF, partly answered emerging needs to modernise statistical systems and make use of new data sources, technologies and methods (see section C.7.3).

Some specific aspects of capacity development

Intimately embedded into capacity development are two aspects that are discussed below. First, the training of the human resources who are involved in statistics must guarantee that skills and knowledge match the requirement for the production and dissemination of quality statistics. This concerns the initial training of the future statisticians as well as the permanent updating of their skills all along their careers in the statistical organisations. Second, statisticians in partner and emerging countries are often isolated from innovation and poorly involved in the international advancement of norms and methods. The sharing of experiences with colleagues, nationally, regionally, and internationally is thus a very relevant way for statisticians in identifying good practices and, in turn, using them in improving the quality of the existing statistical work.

C.7.2.2 CAPACITY DEVELOPMENT THROUGH TRAINING OF HUMAN RESOURCES

Training of statisticians

In most of the world, future statisticians are trained through the university system of their respective countries. In general, the training is very theoretical and the newly graduated statisticians acquire their experience on statistical operations and practices on-the-job during the initial years of employment in a statistical organisation or in an initial period of time with each of their new assignments in the institution. Francophone Africa, however, has established a specific and more professional system through a network of Statistical Schools. Pupils integrate the schools after their college through a competitive test and follow a targeted curriculum (from 3 to 5 years or more – PhD - depending on the level desired) that includes both theoretical and practical aspects. The training programme and the competition are jointly monitored through an organisation, Centre d'Appui aux Ecoles de Statistique Africaines (CAPESA), which involve the schools, African statistical offices, AFRISTAT, French schools of statistics and the French cooperation for statistics.

Box C.7.13: The network of statistical schools in Francophone Africa

Statistical training schools in Francophone Africa opened in the 60's and 70's. Three schools provide training in statistics: ISSEA in Yaoundé, ENSAE in Dakar and ENSEA in Abidjan. ENSEA provides four levels of degree programs: «Ingénieurs Statisticiens Economistes» (ISE), «Ingénieurs des Travaux Statistiques» (ITS), «Adjoints Techniques de la Statistique» (AD) and «Agents techniques de la Statistique» (AT). Apart from classic training, the schools also offer a continuing education programme with specialised courses aiming to recycle professionals, enhance and update their knowledge in statistics. It also develops research activities on various topics covering economic, demographic, and statistical fields. Its graduates work in priority for public institutions but the private sector is more and more recruiting them in order to enhance its statistical apparel.

- Ecole Nationale de la Statistique et de l'Analyse Economique (ENSAE) Dakar
- Ecole Nationale Supérieure de Statistique et d'Economie Appliquée d'Abidjan (ENSEA)
- Institut Sous-régional de Statistique et d'Economie Appliquée

Training for statistical capacity strengthening

Training has always been seen as an important component of capacity development for statistics. This was reflected in an extensive and diverse offer for training courses from financial and technical donors organisations, a systematic inclusion of training within the statistical cooperation programmes and projects, and the strong demand from statistical offices (mainly in partner and emerging countries).

There are many factors behind this constant interest for training that are mainly linked to the nature of the work in statistics offices:

- Official statistics are the result of complex operations. Examples are surveys and censuses, which require long preparation and implementation periods. Other statistics, such as national accounts or price indexes, are built using multiple sources and scientific/well-established methods and practices, which are extensive and challenging to master by the staff. Long training and support are needed in these areas.
- The international norms, standards and practices on which official statistics are built must adjust to a fast-changing environment. The world that statistics measure evolves constantly, calling for regular reviews and adjustments of estimation methods. An example is external trade of services, an area that was lightly assessed some years ago. However, due to its growing importance new recommendations have been developed, which need to be disseminated and internalised in the current statistical work. Another example is the recommendations from the 19th International Conference of Labour Statisticians regarding new patterns of employment. These recommendations need to be nationally implemented, requiring an extensive training effort.
- Rapid turnover of staff in the public services, including statistical organisations. On-the-job training is often one of the few incentives that can be offered to staff by the management. Considering the complexity of statistical work, the training (initial and on-the-job) of the staff of a statistical organisation is expensive. Thus, the rapid turnover generates significant losses not only of human resources but also of financial resources, not to mention the difficulties caused to the continuity of work. Consequently, external support is always welcome to compensate for scarce local resources for training.

One question that is central to the issue for a statistical organisation is linked to the choice between creating an in-house capacity for training (with all the implications regarding the design and the implementation of the courses) or using external facilities and resources. Most of the statistical offices in partner countries don't have the resources to create their own training centre and they often have to rely only on the offer from outside. This may make more economic sense, but the setback is that there will be no control on the topics and the calendar and that may sometimes make conducting the work difficult (training opportunities may coincide with periods of heavy work in the institution). The result will be a lose - lose choice: to work without the staff in training (and frustrating the other members of the team) or to forbid the staff to go on training (thus frustrating them).

Box C.7.14: An extensive offer of training courses for statisticians regionally and internationally

Most of the regional and international organisations involved in supporting statistics have developed extensive training programmes. These programmes concern in particular the norms and standards that these organisations have developed and want to promote. The international institutions generally address issues that are in their core business (i.e., statistics of the Balance of Payments for the IMF, labour statistics for the ILO or population statistics for UNFPA).

The regional organisations focus more on harmonisation methods and practices in their member states (and sometime their close neighbours), covering a wide range of sector and horizontal topics (National accounts and prices statistics for AFRISTAT, external trade statistics for goods and services for ASEANStat for example). They may all also address more horizontal issues such as the measurement of the SDGs or gender statistics. In these latter cases, coalitions of donors may be built to intensify/extend the training offer to the countries or to share the burden of the design and implementation of the courses. Some bilateral cooperation agencies and statistical offices are heavily involved in providing training on statistical issues related to their development priorities. A Global Network of Institutions for Statistical Training (GIST) have been established under the auspices of the UN statistical division. Most of the providers of training are members and it is also a resource reference for identifying the offer of statistical training.

Source: Global Network of Institutions for Statistical Training (GIST): Courses Inventory

E-learning/Distance learning

For a long time, on-line training was not considered relevant for providing courses to participants in the partner and emerging countries. Two main arguments were usually used against e-learning. First, the access to internet was technically not safe and secure enough to ensure a proper delivery of the course by the trainers and an active participation from the trainees (heavy training material difficult to download, interruptions in the connection during the lessons, desynchronised video and sound …). With the dramatic progress made recently everywhere in the world, the issues linked to bad connections are far less prominent today. Second, it was argued that it was difficult for the trainees to be fully detached from their day-to-day tasks if they had to receive training at their office. The "training availability" of the trainees was not acknowledged by both their colleagues and their management and following an e-learning often meant to work overtime (against having a full availability outside of the office in the case of traditional classroom training courses). This second aspect is still an issue but, with the multiplication of the available sources of e-learning (to-day, they cover almost all key statistical issues and sectors) and the flexibility that this mode of training leaves to trainees, this is quickly changing. E-learning is today a common way of delivering training everywhere and particularly for statistics.

Box C.7.15: Asian Development Bank experience

The Asian Development Bank's experience showed that Massive Open Online Courses (MOOCs) can reach a wider audience at substantially lower per-capita costs than in-class statistics capacity development activities. Further, strategic partnerships with other agencies maximized the use of resources in developing MOOCs on topics of mutual interest and widened the network of contacts to reach more people. Correspondingly, the wider reach of the MOOCs also enabled it to cater to typically underserved groups, such as women as well as individuals from low to lower-middle-income economies.

Source: Asian Development Bank / Development Asia: Designing Online Courses for Statistical Capacity Building

Preparing a training course

The preparation of a training course (a training for adults) must follow successive steps. The first one is the assessment of the needs. This assessment should cover the organizational goals and context (what the organisation want to achieve and how the proposed training course may contribute alone or with complementary activities), the participant profile and existing knowledge/skills (what already exists in terms of skills and achievements regarding the goal of the organisation), current job tasks and knowledge/skill gaps (what should be the focus of the course to fill the gaps) and follow-up requirements (how to consolidate the course outcome as to generate the maximum benefit for the trainee and the institution). All these elements will contribute to designing the course profile, a document that should be shared with the trainees, their institutions, the trainers, and the organiser/funder of the course. The profile should review the topic, the training objective, the learning objectives, the targeted audience, the course outline, the type of training material, the mode of delivery, the calendar and other organisational issues (including IT tools to be used). This document should be the result of a participative and consensual process as to match the needs of the organisation benefiting from the course.

Box C.7.16: FAO: Practical tool for assessing training needs

Individuals participating in a learning initiative are always part of a larger organizational context: for example, a rural association, a community-based organization, a ministry, a network of organizations. Once back in their context after having completed the activity, they will be faced with having to apply their new learning in their work setting.

Paying attention to the organizational context as part of a learning needs assessment helps to gear the contents of the initiative to the participant and to organizational needs. This is important to ensure that the newly acquired learning will be translated into practice and "transferred" sustainably to the workplace, with positive impact on overall organizational capacity.

Source: FAO: Capacity development – How to assess learning needs

Increasing **statistical literacy** and training the users are today key aspects of communication for statistics and certainly an important factor for improving the trust in official statistics. Many statistical organisations realised that their data were not entirely understood by the users and that misinterpretation and incorrect use could harm their reputation and the reputation of their products. The issue is not easy to address as each group of users will have to be dealt with differently according to their respective initial level of understanding and interest in statistics.

Box C.7.17: UNECE: Statistical literacy – why?

- Numerous misunderstandings and misinterpretations of (official) data can be observed in media reports, in daily newspaper articles and in direct contact with users. This weakness in quantitative skills is summarized under the term statistical innumeracy. In particular, among the younger generations and in partner countries there is an increasing need to understand quantitative data and facts. Nowadays, it has become an inevitable requirement of contemporary societies to interpret quantitative data.
- Statistical literacy is more than numeracy. It includes the ability to read and communicate the meaning of data. This quality makes people literate as opposed to just numerate. Wherever words (and pictures) are added to numbers and data in statistical communication, people need to be able to understand them correctly.
- Getting users to appreciate the value of statistics is perhaps the most difficult and fundamental step. Decision makers in businesses and politics may need support particularly at this stage. The general public is also important, as high-quality official statistics are an essential pillar of democratic societies. This is challenging, because statisticians are often not used (or not asked!) to leave the field of statistics and to comment on or interpret the results. Statisticians therefore have to help data users to interpret and use the figures correctly, because the statisticians often have a better understanding of what the figures show and what they do not show.

Source: UNECE: Making Data Meaningful – Part 4: A guide to improving statistical literacy (2014)

Evaluating the impact of training

Training has often been considered as a way to increase knowledge and skills of individuals. However, capacity development must also be addressed at another more comprehensive level: the one of the organisation to which the trainee belongs. Individual capacities should be translated into institutional capacities to generate sustainable changes and improvements. This is made even more important by the rapid turnover of the staff in the statistical organisations. As a consequence, the standard evaluation forms and tests that are applied to the training course, and which only address the feedback and level of learning of the individual trainees) should be complemented by other activities aiming at transferring what has been learned by the trainee into her/his institution. This should ideally be piloted by the institution as part of its training strategy.

Different practices exist: a systematic presentation by the trainee of the training result to her/his colleagues (immediate colleagues or larger audience), a report on the training received circulated within the institution and accessible to the staff or a proposal for improvement in practices or methods used by the institution based on what has been learned. To efficiently evaluate the impact of these "follow-up" activities, the results of the individual training evaluation forms made immediately after the course (that include questions related to the relevance of the course for the job and to the future use of the skills acquired) should be confronted to what has effectively been done and applied in the organisation as a benefit of the training course. To that extend, "Post-evaluation" forms may be submitted by the organisers/ funders of the training course to both the former trainees and their management that will consolidate the information on the impact of the investment made.

Box C.7.18: Training evaluation in the World Health Organization

To "evaluate" training means finding out what the "value" of training really is – to the trainees, their managers, their colleagues, the organization for which they work, and for the wider community. Thus, it is important to define clearly the training objectives so that the results of the training can be measured against them. The training objectives should not be imposed by the agency doing the training but should be defined in collaboration with country representatives to ensure that they fit the local context.

The assumption that training automatically leads to changed behaviour or improved work standards is simply not valid. Not all trainees change their work methods, or their approach to work, after training – even if they say they appreciate and enjoy the training sessions.

The reasons for evaluating training include:

- tracking the development of people's knowledge and skills;
- finding out whether the training is appropriate to the trainee and whether the learning is being applied;
- identifying gaps and future needs in training;
- finding out if the investment in training was worthwhile or whether alternative methods to improve performance (e.g., job rotation, incentives) are needed instead;
- obtaining information on which to base future training plans and strategies.

Source: World Health Organization (WHO): Evaluating training in WHO (2010)

Statistical organisations and international forums

The international statistical community offers many opportunities for statisticians to meet and exchange information, experiences and opinions. Beyond expert groups, high level groups or the so-called 'City groups' (which are pretty specialised and gather very high level professionals - to set rules, define standards, propose methods) and the annual meeting of the UN Statistical Commission (targeting the heads and high management of the statistical services), there are other meetings and conferences that are open to all statisticians and that are occasions to present research and studies and to talk about new and innovative practices and methods.

The regional organisations involved in statistics also carry out regular organic meetings to discuss harmonisation and innovation within the member countries. For example, the heads of the statistical offices of the European Union meet yearly to elaborate the statistical programme of the Union. The same applies to other regional organisations such as ASEAN, UEMOA or CARICOM.

The 1st **UN World Data Forum** was organised in 2017 in Cape Town and focused on data for sustainable development and the relation between producers and users of statistics. The 2nd World Data Forum was held in Dubai in 2018 and addressed the challenges linked to the measurement of the SDGs. The 3rd World Data Forum was arranged online as a 'virtual conference', due the COVID 19 pandemic. The 4th World Data Forum was held in Bern, Switzerland, in October 2021, while the most recent one took place in Hangzhou, China, in April 2023. The forum is also open to non-statisticians, thus giving a chance to discuss collaborative partnerships, particularly in the context of the Agenda 2030.

The **International Statistical Institute (ISI)** was founded in 1885 and is the oldest professional association for statisticians. Members are individuals but also organisations. ISI develops many activities over the year, culminating every two years in its World Statistics Congress. Thousands of statisticians meet at these occasions and address selected topics through classroom presentations, technical papers and work group meetings. The latest World Statistics Congress was held in July 2023 in Ottawa, Canada.

Seven associations have been established under the umbrella of ISI which also develop targeted activities and organise workshops and conferences.

Box C.7.19: Affiliated societies of the International Statistical Institute

- International Association of Survey Statisticians (IASS) (since 1973)
- Bernoulli Society (BS) (since 1975)
- International Association for Statistical Computing (IASC) (since 1977)
- International Association for Official Statistics (IAOS) (since 1985)
- International Association for Statistical Education (IASE) (since 1991)
- International Society for Business and Industrial Statistics (ISBIS) (since 2005)
- The International Environmetrics Society (TIES) (since 2008)

Source: International Statistical Institute: The ISI Family

A key issue when considering statistics capacity development is ensuring that the action under consideration is likely to make a significant practical difference to statistical operations.

The logical framework (or 'logframe') for a regional statistics training project, presented in Box C.7.20, shows the main elements for development and managing such a project. The first column, entitled 'Project Description', first states the main purpose of the project, then the expected general result, which is again detailed into a number of practical outputs (or 'operational objectives'). For each of these aspects of the project planning, one can follow the rows to find:

- Indicators which can be used for assessing progress and evaluating the final results for that aspect of the project;
- How to identify sources for verifying the results of these indicators; and
- The assumptions that have to be met for the different aspects of the project to be fulfilled.

Box C.7.20: Logical framework for regional statistical training programme

	Project Description	Indicators	Source of verification	Assumptions
Purpose	The overall objective of all statistics interventions is to support the region and its Member States to produce statistics to inform decision making by meeting the relevant quality criteria: the UN Fundamental Principles of Statistics and the African Statistics Charter.	Statistics and metadata from the regional secretariat, Member States and from IMF GDDS; reports indicating the use made of statistics by government, private sector and civil society.	Statistics publications from the regional secretariat, Member States' and IMF GDDS websites and paper publications. Indicators of use of statistics verified through internet search and collection of relevant publications.	Sufficient financial support from region Member States is forthcoming; regional Member States produce and implement strategic plans for statistics such as National Statistics Development Strategies (NSDS); regional secretariat produces and implements a regional equivalent.
Results	Ensure that the capacity exists within the region to provide statistics-related training that directly enables statistics producers to improve the quality of statistics produced and for users to improve the quality of their statistical analysis.	Preparation of each training course to identify the expected outcome in each Member State and in the regional secretariat, as well as other steps required to achieve expected impact.	Training course reports; resulting statistics.	Other inputs are often required, notably statistical tools and systems; staff assigned to training must be capable of being trained; management of NSIs must be supportive of change.
Operational objectives – outputs	Trainees already working within National Statistics Systems have improved technical and management knowledge that is directly relevant to their work.			Sufficient project staff, including dedicated project management, remain assigned over its whole life.
1	Syllabus for training at defined level, capable of international accreditation, implemented widely throughout region.	Syllabus and training materials available; courses wholly and/or partly based on materials being delivered; courses accredited.	Materials availability: website and CD-ROM available from regional secretariat. Course delivery: course notices on internet and prospectuses. Accreditation: accreditation authorities.	Materials availability: website flexibility. Course adoption: institutional regulations. Accreditation: accrediting institute regulations and capacity.
2	Training Short Courses at professional level delivered at regional level.	Short courses delivered: course reports, including documented expected outcome at country level; follow-up reports.	Course reports; follow up reports.	Requirement for documentation of expected outcome included in each set of Terms of Reference; follow-up can be effectively implemented.
3	Training methodologies transferred to national level.	Short courses delivered: course reports, including documented expected outcome; follow-up reports.	Course reports; follow up reports.	Methodology can be transferred effectively to Member States.

To find out more…

about how to assess statistical capacity:

- PARIS21: Capacity Development 4.0
- PARIS21: Data Ecosystem
- PARIS21: Statistical Capacity Development Outlook (2019)
- PARIS21: Measuring Statistical Capacity Development: a review of current practices and ideas for the future – moving towards Statistical Capacity 4.0 (2018)
- PARIS21: Assessing the capacity of national statistical systems: a users' guide (2018)
- PARIS21 Task Team report: Statistical Capacity Building Indicators (2002)
- European Commission – International Partnerships/EuropeAid: Institutional Assessment and Capacity Development: Why, what and how? Aid Delivery Methods Concept Paper 09/2005
- UNECE Statistical Capacity Development wiki: Capabilities, Maturity Models and Roadmaps
- World Bank: Statistical Performance Indicators

about how to develop statistical capacity:

- United Nations Statistical Commission (UNSC): Cape Town Global Action Plan for Sustainable Development Data (2017)
- UNECE / Conference of European Statisticians: UNECE Statistical capacity development strategy (2018)
- Eele, Graham: Building statistical capacity: The challenges, PARIS21 Discussion Paper No. 7, Paris (2015)
- Bester, Angela: Study on Capacity Development, prepared for the United Nations Department of Economic and Social Affairs for the 2016 Quadrennial Comprehensive Policy Review (2016QCPR) (2015)
- OPM: Evaluation of the Implementation of the Paris Declaration: Thematic Study – Support to Statistical Capacity Building, Synthesis Report, 2009
- European Commission DG International Partnerships / EuropeAid: Project Cycle Management Guidelines (2004)
- African Union Commission, African Development Bank, African Capacity Building Foundation and United Nations Economic Commission for Africa (UNECA): Strategy for the Harmonization of Statistics in Africa 2017-2026 (SHaSA 2) (2017)
- PARIS21: Guidelines for developing statistical capacity: A roadmap for Capacity Development 4.0 (2020)

about funding for statistical capacity development:

- OECD: Development Co-operation Report 2017, chapter 'Rethinking donor support for statistical capacity building' (2017)
- PARIS21: Financing challenges for developing statistical systems: A review of financing options, PARIS21 Discussion Paper, No. 14, Paris (2019)
- World Bank: Statistical Performance Indicators
- The Bern Network on Financing Data for Development (Bern Network)
- European Commission – DG International Partnerships: Funding and technical assistance

about training as a means for developing statistical capacity:

- United Nations Economic Commission for Europe (UNECE): Human Resources Management and Training – Compilation of Good Practices in Statistical Offices (2013)
- Global Network of Institutions for Statistical Training (GIST): Courses Inventory
- Asian Development Bank/Development Asia: Designing Online Courses for Statistical Capacity Building
- Dag Roll-Hansen: In-house training in statistical organisations – Some issues to consider and suggestions for courses, Statistics Norway Documents 31/2012 (2012)
- Centre d'Appui aux Ecoles de Statistique Africaines (CAPESA)
- Food and Agriculture Organization of the United Nations (FAO): Capacity development – How to assess learning needs
- World Health Organization (WHO): Evaluating training in WHO (2010)
- United Nations Economic Commission for Europe (UNECE): Making Data Meaningful - Part 4: A guide to improving statistical literacy (2014)

about other useful resources and references:

- Open Group Architecture Framework
- United Nations Statistics Division: Methodology – City Groups
- United Nations Statistical Commission
- United Nations World Data Forum (UN WDF)
- International Statistical Institute (ISI): Scientific Congresses (including World Statistics Congresses) and ISI family

C.7.3. Coordinating with other programmes and other development partners

C.7.3.1 FUNDING OF STATISTICAL CAPACITY BUILDING IN THE PAST DECADES

The Marrakech Action Plan for Statistics (MAPS) in 2004 and the Busan Action Plan for Statistics (BAPS) in 2011 called for increased investment in statistical systems and strategic planning for developing statistical systems, while improving the coordination and accountability of the international statistical system. In response to this, a set of financing instruments were established to provide required funding for the development and the implementation of National Strategies for Development of Statistics (see section C.7.1) or similar strategies and comprehensive statistical development plans, as well as associated activities.

Partner countries generally need financial assistance for investments in infrastructure, people and equipment. However, the poorest partner countries may also need assistance to cover recurrent costs, at least in the shorter term. This challenge calls for donors to increase their financial support for statistics and, at the same time, for partner countries to provide increased domestic budget allocations, in order to build a sustainable statistical system.

To assess progress, the international financing instruments for statistical capacity development encourage partner countries to apply international standards and frameworks. These include the UN's Fundamental Principles of Official Statistics (see Box B.2.1), the IMF's Enhanced General Data Dissemination System (e-GDDS) (see Box C.6.5), as well as NSDS or similar strategies for developing national statistical capacity in support of National Development Plans, Poverty Reduction Strategies or other development planning. Based on the goals of the NSDS, measurable targets and indicators of success should be defined. Key methods and tools for assessing and measuring statistical capacity and for developing it in an efficient and result-oriented manner were described in section C.7.2.

The preparation of an NSDS is an essential step in improving the capacity of statistical systems. This is an important mechanism for coordinating financial and technical assistance to statistics in accordance with national priorities. NSDS and the associated implementation and financing programmes lead towards more coordinated financing for statistics and bring financial support from donors together in a coherent and consistent framework.

The design of a NSDS can be supported by bilateral and multilateral donors. The Trust Fund for Statistical Capacity Building (TFSCB) has been an important source for financing of NSDS and statistical capacity building. It was financed by contributions from multiple donors and was administered by the World Bank. In Africa, the preparation of NSDSs has also been supported by the African Development Bank.

In its 22 years of existence, between 1999 and 2021, the TFSCB approved 432 grants worth over USD 100 million to 149 low and middle-income countries.

To provide substantial and sustained investment in statistical capacity, the Statistics for Results Facility (SRF) was set up in 2009. SRF was a global initiative concerned with strengthening statistical systems and developing capacity in the poorest partner countries. The Statistics for Results Facility Catalytic Fund (SRF-CF) was a multi-donor programmatic trust fund, like TFSCB managed by the World Bank on behalf of the donors. The SRF-CF trust fund closed at the end of 2019. A final evaluation of the SRF-CF was published in December 2019.

To find out more…

- Marrakech Action Plan for Statistics (MAPS) (2004)
- Busan Action Plan for Statistics (BAPS) (2011)
- World Bank – Development Data Group: Statistical Capacity Building
- Snorrason H., Flatt A. J., Østereng H. K.: Report on the final evaluation of the SRF-CF (2019)
- UN Statistical Commission: Background document to the report of the Intersecretariat Working Group on National Accounts (2021)
- Commission Implementing Decision C(2021) 3046 on the financing of the Programme for single market, competitiveness of enterprises, including small and medium-sized enterprises, and European statistics and the adoption of the work programme for 2021-2024 - Annex (2021)

C.7.3.2 NEW INITIATIVES FOR FUNDING OF STATISTICAL CAPACITY BUILDING

To accelerate action towards the SDGs, the United Nations General Assembly has initiated a 'Decade of Action and Delivery', calling on everyone to re-double their efforts to achieve the Agenda 2030 and leave no one behind.

However, there is still a severe gap in timely, accurate, and reliable data on the SDGs. These missing data reduce the ability of countries to design and implement efficient and effective policies and programmes, spot opportunities and avoid risks, and monitor progress. According to PARIS21, international funding for data and statistics is only around half the level that it needs to be, as established in the Cape Town Global Action Plan for Sustainable Development Data (CTGAP). The most severe data gaps are in the poorest and most fragile countries, where governments lack the resources to build strong statistical systems.

The CTGAP identifies strategic areas that need strengthening and serves as a framework for investment. The Dubai Declaration, announced at the UN World Data Forum in 2018, calls for the establishment of a funding mechanism to mobilize domestic and international funds to strengthen the capacity of national data and statistical systems.

The Bern Network on Financing Data for Development has been set up as an open, multi-stakeholder alliance that brings aid and development agencies, national statistical offices,

ministries, private sector and civil society groups together to advance the 2030 Agenda for Sustainable Development by promoting more and better financing for development data.

The Bern Network was established in 2019 by the Swiss Agency for Development and Cooperation and the Swiss Federal Statistical Office, together with partners, to catalyse change in the amount and quality of resources for data and statistics ahead of the United Nations World Data Forum in 2021 in Bern, Switzerland. It is led by a group of core members including Global Partnership for Sustainable Development Data, OECD, Open Data Watch, Switzerland, PARIS21, the United Kingdom, United Nations Statistics Division, and the World Bank. It is hosted by PARIS21.

Following the expiration of the TFSCB and SRF-CF, the World Bank, in coordination with the UN and development partners, launched the Global Data Facility (GDF). GDF is an innovative funding instrument aimed at coordinating support and mobilizing at least USD 500 million until 2030. It aims at covering projects spanning the full range from building fundamental statistical capacity to dealing with the frontiers of statistics.

Box C.7.21: The Bern Network: proposal for commitments on funding for development data

The Bern Network states that:

Building the statistical infrastructure for the Decade of Action will require a strong political commitment to scale up and make better use of existing funding. Partner country leaders need to scale up their support to NSSs. Their partners, bilateral and multilateral alike, will have to coordinate their support and get behind national priorities. Additional funding will have to come from domestic resources, if possible, and from aid providers, if necessary.

A stronger, mutual financial commitment is paramount. But to be effective, it should come with a set of sensible commitments about our partnership that reinforce and support one another. Taken together, they will improve the quantity and quality of development data by creating efficiencies in current spending, leveraging existing resources, and attracting new funding. Making this a reality will require a shared vision between partner countries and their partners:

- **Mobilise domestic resources.** Domestic resources will have to account for the largest share of additional funding for data and statistics in partner countries. Strong commitments from partner country leaders to invest in data and statistics should therefore be incentivised. The efforts of NSOs to lobby for funding should be supported and championed in cooperation with ministries of finance, budget committees, and national statistical offices.
- **Scale up funding.** Donors – bilaterals, multilaterals, foundations, and thematic global funds – should commit to increasing financial support to data and statistics, which currently account for only one third of a percent of total Official Development Assistance (ODA). Various options are available. For instance, donors could establish a fresh pooling arrangement to fund system-wide improvements. Donors could also coalesce around a 'data compact for the poor'. Multilateral donors – regional and international financial institutions and UN agencies – have been key partners of national statisticians all around the world. They could commit to scaling up their support to data and statistics. Coordinating the use of their resources with any new mechanisms that will be established has to be a priority.
- **Boost efficiency.** Development cooperation actors should streamline their support, follow best practices, and adhere to aid transparency standards. To avoid duplication, actors could commit to using country-produced data wherever possible and to sharing their own data whenever collection cannot be avoided. They could also commit to allocating a small percentage of their project funds to strengthening relevant data and statistical systems. This should help spark a virtuous cycle in which increased demand leads to increased use, which will thereby strengthen and improve the statistical system to respond to growing demand. This can also help ensure investments follow a holistic strategy to develop capacity of the system as opposed to piecemeal interventions. As a general principle, a "do no harm" approach should be adopted.
- **Strengthen collaboration.** There is ample scope to strengthen coordination between donors and among donors and partner countries, promote south-south cooperation, and harness digital technologies to make the status quo of funding for statistics more cost-efficient. The Bern Network has been exploring the inventory of existing sources of information on support to statistics and data gaps. Based on this work and building on existing initiatives, it is developing an online Clearinghouse for Financing Development Data to provide near real-time information on data supply and demand to support more effective decision-making on financing for data and statistics.
- **Leverage sectoral funds.** Sectoral data investments are valuable as they aim to strengthen core systems that can support and sustain outcomes in areas such as health and agriculture. There are opportunities to gain efficiencies in such investments and make them more sustainable by connecting them to national statistical systems. Improved integration between administrative data systems and core statistical systems can have cost-saving benefits, work towards closing data gaps, and lead to a stronger national statistical system overall. The Bern Network is exploring how to connect lessons learned from sectoral project and fund investments in data and how to leverage the benefits across sectors to build a stronger foundation for countries' statistical and administrative systems, including under the Clearinghouse.

Source: The Bern Network: More and Better Development Data for a Decade of Action (factsheet; 2021)

The Bern Network is also developing a 'Clearinghouse for Financing Development Data'. The Clearinghouse aims to help countries, donors and development partners identify funding opportunities, bring projects to scale, advocate for support to data and statistics and connect to new partners. The online platform will provide information and services to match the supply and demand of financing for data and statistics to foster transparency, accountability, and alignment, and facilitate coordination among donors and partner countries.

For the European Union, the new 'Neighbourhood, Development and International Cooperation Instrument - Global Europe' (NDICI – Global Europe) is the EU's main financing tool for development cooperation for the programming period 2021-2027. It will be key to achieving the international commitments and objectives that the EU has agreed to, in particular the 2030 Agenda and the Sustainable Development Goals and the Paris Agreement. NDICI - Global Europe gathers several current external financing instruments under the EU budget, including the European Development Fund (EDF) and the Development Cooperation Instrument (DCI). The NDICI gives particular priority to the countries most in need, particularly low-income countries, fragile or crisis-struck countries, supporting them to overcome long-term developmental challenges, in particular with eradicating poverty and promoting sustainable development, prosperity, peace and stability. For more details on the NDICI, see section B.3.3 and the link given in the 'To find out more' box below.

To find out more…

- High-level Group for Partnership, Coordination and Capacity-Building for Statistics (HLC-PCCB): Cape Town Global Action Plan for Sustainable Development Data (CTGAP) (2017)
- High-level Group for Partnership, Coordination and Capacity-Building for Statistics (HLC-PCCB): Dubai Declaration (2018)
- United Nations World Data Forum
- PARIS21: Financing challenges for developing statistical systems: A review of financing options, PARIS21 Discussion Paper, No. 14, Paris (2019)
- PARIS21: Mobilising Data for the SDGs, PARIS21 Discussion Paper, No. 15, Paris (2019)
- PARIS21: Statistical reporting, data and analysis, including the Partner Report on Support to Statistics (PRESS) and Country Report on Support to Statistics (CRESS)
- Bern Network on Financing Data for Development and the Bern Network brochure 'More and better development data for a Decade of Action' for the UN World Data Forum in Bern, Switzerland (2021)
- Bern Network: Clearinghouse for Financing Development Data (brochure) (2020)
- Regulation (EU) 2021/947 of the European Parliament and of the Council of 9 June 2021 establishing the Neighbourhood, Development and International Cooperation Instrument – Global Europe
- World Bank: Global Data Facility
- DG International Partnerships: Global Europe: Neighbourhood, Development and International Cooperation Instrument and factsheet

C.7.3.3 CO-ORDINATION OF PARTNERS AND ACTIVITIES

Good practices on how to develop strategic planning frameworks for the development of statistics can be found in PARIS21's National Strategies for the Development of Statistics (NSDS) Guidelines and in its NSDS Knowledge Base. The NSDS Guidelines provide guidance on how to use a system-wide (or programme-based) approach to support the strengthening of NSSs. The approach emphasises the central importance of implementing well-designed and realistic strategies for development of the NSS, directly linked to national development plans, poverty reduction strategies or other development strategies. The Guidelines provide operational guidance for managers and funders of NSSs on moving from the preparation of plans and strategies to their implementation.

In statistics-related fields, as in other areas, donors typically specialise in a limited number of technical fields, provide financial support across wider areas, and leave some subjects to other development partners. To avoid duplication and the involvement of development partners in statistics actions outside their areas of expertise, coordination within the development community at large is essential.

One of the key principles underlying the Cape Town Global Action Plan (2017) is **Cooperation:**

> ***"Cooperation.*** *The Plan recognizes the crucial role of cooperation among countries, regional organizations, and other international organizations and stakeholders in supporting countries' plans and efforts in capacity building. The Plan recognizes the expertise and abilities of these key stakeholders as essential resources for progress and modernization. Indeed, they have a crucial role in capacity building exercises and in carrying out statistical capacity building efforts in their areas of work. Nonetheless, the role of international organizations and regional entities to the development of methodologies and data in their respective programmes must be conducted in full consultation and coordination with National Statistical Offices. Coordination and streamlining of these activities are necessary to avoid duplication of efforts and channel effort to furthering the Agenda."*

This is directly reflected in the CTGAP's Strategic Area 5 'Multistakeholder partnerships for sustainable development data' and in particular in Strategic Area 6 'Mobilize resources and coordinate efforts for statistical capacity building':

Objective 6.1: Ensure that resources are available to implement the necessary programmes and actions as outlined in this global action plan (both domestic and from international cooperation)

Key Actions:

- Provide an overview of capacity needs based on the implemented or existing needs assessments and consider appropriate matches between types of support and types of needs.

- Identify and coordinate existing resources, including south-south and triangular cooperation mechanisms, to strategically address these needs, and identify resource gaps.
- Develop a programme for statistical capacity building on the basis of capacity needs.
- Mobilize donor support towards the priorities agreed in national and regional statistical strategies and promote reporting on financing for statistics.
- Create opportunities for participation of non-state actors in funding statistical activities through innovative financing mechanisms using means consistent with the UN Fundamental Principles of Official Statistics.
- Promote nationally and/or regionally-owned coordination mechanisms of capacity building initiatives
- Support countries in the implementation of the SDG indicator framework.
- Engage in communication and advocacy activities at the policy-making level to raise awareness and understanding of implementation aspects of the SDG indicator framework.
- Develop criteria and mechanisms to set priorities for the mobilisation of resources.
- Promote the sharing of relevant implementation experiences between countries.

The importance of coordination of resources and cooperation between stakeholders both at national level and with international partners was further highlighted in the Dubai Declaration (2018), where the participants resolved to:

> *"Work in a collaborative manner to bring all data communities together to implement the CTGAP, our common framework for the modernization and strengthening of statistical systems, and the design and implementation of country-led statistical capacity building activities necessary to achieve the 2030 agenda."*

The European Consensus on Development underlines the critical value of working in partnership, and commits the EU and its Member States to work hand in hand under the motto 'Working better together':

> *"In response to global challenges, the EU and its Member States will further improve the way they deliver their cooperation, including by working together better, taking account of their respective comparative advantages. This includes improving effectiveness and impact through greater coordination and coherence, by applying the development effectiveness principles and by delivering development cooperation as one part of the overall internal and external action to promote the implementation of the 2030 Agenda. To be more effective in pursuing its objectives, and consistent with the primary aim of eradicating poverty, the EU's development policy should be adaptable and responsive to changing needs, crises and priorities."*
>
> *"At country level, the EU and its Member States will enhance Joint Programming in development cooperation to increase their collective impact by bringing together their resources and capacities. Joint Programming should be promoted and strengthened, while being kept voluntary, flexible, inclusive, and tailored to the country context, and allow for the replacement of EU and Member States' programming documents with EU Joint Programming documents. Partner country engagement, appropriation and ownership are essential for this process. Joint Programming should be led by the partner country's development strategy and aligned to the partner country's development priorities. The EU and its Member States will work together to develop strategic responses grounded in shared knowledge, added value, lessons learned and joint analysis of the country context, including poverty and sustainability, and the country's overall relations with the EU."*
>
> *"The increased use of EU joint responses derived from Joint EU Programming can ensure greater impact and visibility for the EU and its Member States on the ground. This approach will help pool resources, reduce fragmentation and boost effectiveness. Joint monitoring and results frameworks will be core elements of the joint response to maintain momentum, inform dialogue and enhance mutual accountability."*
>
> *"The EU and its Member States will also seek to support partner countries through joint implementation whenever appropriate. Joint implementation is a way of promoting more coherent, effective and coordinated EU support based on shared objectives in selected sectors or on specific cross-sectoral themes and tailored to the country contexts."*
>
> *"Joint implementation will be inclusive and open to all EU partners who agree and can contribute to a common vision, including Member States' agencies and their development financial institutions, the private sector, civil society and academia. This could also, when assessed to be relevant, include other like-minded governments, the United Nations and other international and regional organisations and financial institutions."*
>
> *"Stronger partnerships are at the heart of the EU's approach to SDG implementation. The EU and its Member States will work more closely with all other relevant actors to promote the implementation of the 2030 Agenda and strengthen their capacity for democratic ownership."*

The European Consensus on Development is described in more detail in section B.3.3.

Different modalities can be applied for coordination of support to statistical systems and developing statistical capacity in partner regions and countries:

- The beneficiary country or region has a responsibility for coordinating external assistance. A statistical strategy such as a NSDS is the best means of coordinating internal and external resources, both financial and technical. A primary benefit from this level of coordination of statistics is the reduction or elimination of superfluous statistical operations.
- Development partner committees in the beneficiary countries, including the participation of EU Member States, provide a key element of coordination. Some development partners have highly decentralised decision processes, providing information about the content of activities through channels within a beneficiary country. This is

particularly the case with sector projects. In these, statistics may form a relatively small part. This could lead to only the main sector of operations being recorded centrally and that information about the statistical implications is missing.

- The international organisation charged with coordinating the sector statistics in question is an important information source. One example of international organisations' coordination is the preparation of the 2020 World Population and Housing Census Programme through the UN Statistics Division. Websites and other documents provide information about regionally and globally coordinated actions. International and global organisations responsible for statistics in specific sectors are identified in section B.2.4.
- Information about EU support for the development of statistics.

Standard project information does not necessarily provide full information on statistical activities or on the data provided for the relevant results frameworks applied. Potential overlaps can occur between national and regional projects; between sector support for statistics and statistics parts of projects in other sectors; and between support actions for overlapping regional organisations.

The national ownership and the coordination of activities through the national development plans and national strategies for development of statistics should identify and minimise such overlaps and duplications.

To find out more…

- European Consensus on Development (2017)
- Cape Town Global Action Plan for Sustainable Development Data (CTGAP) (2017)
- Dubai Declaration (2018)
- PARIS21: Guidelines for National Strategy for the Development of Statistics (NSDS)
- PARIS21: Statistical reporting, data and analysis, including the Partner Report on Support to Statistics (PRESS) and Country Report on Support to Statistics (CRESS)

C.8 The European Commission's support to statistics

C.8. The European Commission's support to statistics

The chapter in brief

The chapter starts from the point at which the development partners accept that there is a need for external support to statistics. The chapter aims to inform the subsequent decision about whether and how the European Commission should be involved. It first considers the Commission's statistical development activities in the context of country / regional strategies and programmes, including any statistics strategy. It continues by looking at the purpose of statistics actions and how they are linked to the development objectives using the logical framework. The chapter finishes with a practical look at the various types of European Commission statistics interventions, showing links with policies, identifying areas of cooperation, listing examples, and providing action points.

C.8.1. Objectives for statistics actions: statistics as policy support

Statistics are instrumental in achieving policy goals, as discussed in chapter B.1. However, statistics may be unavailable or of poor quality, thus making it impossible to construct and use the indicators needed to prepare, monitor, and evaluate a specific programme. The diagnosis section in a strategy paper should identify areas where absent or poor-quality data are a significant constraint to achieving policy goals. If statistics are a constraint across many fields, this can be considered as a governance issue. In a regional context, insufficient statistics can be a barrier to regional integration and regional policy goals.

The response strategy should identify support for reliable, relevant, and timely statistics as a means to inform policy preparation, monitoring, and evaluation in the area(s) of concern. Support should focus on strengthening statistics by better meeting the relevant quality criteria, including the UN Fundamental Principles of Statistics (see section B.2.1), thus making the data better suited to support decision-making. Actions in support of statistics should be provided within the frame of the National Strategy for the Development of Statistics (NSDS), which should be compatible with national development plans or poverty reduction strategies (see section C.7.1).

The availability of good-quality statistics is a precondition for proper strategic analysis and for programming and design of concrete interventions. The analysis should address the state of the statistical system, its strengths and weaknesses and outline any remedial or quality improving actions required.

Box C.8.1: Check points to assure statistical actions are aligned with policy goals

- The statistics action is aimed at supporting a policy that is itself compatible with the partner country's and/or partner region's development strategy and is therefore mentioned in the relevant programming documents.
- Statistics actions, including their scope, should be compatible with national statistics strategies (NSDSs).
- National / regional ownership of the statistics action is clearly demonstrated.

C.8.2. Matching outputs to objectives: the logical framework of a statistics action

The purpose of any statistics-related intervention by the European Commission is to support the partner country and/or region to sustainably produce good-quality statistics in order to inform decision-making. In order to focus support on achieving policy goals, it is important to identify and classify the types of intervention being considered. This will help ensuring that planned activities will achieve the objectives. All European Commission statistics actions aim at one or more of the following **specific objectives**:

- Improve coverage and quality of statistical information (output);
- Improve capacity to collect, process, analyse and disseminate statistical information (capacity building);
- Improve the use of statistical information (use).

For example, an action to support the adoption of statistics standards in a partner country might include specific objectives that cover both output and capacity building.

The specific objective in the example in Box C.7.20, presenting the logical framework for a regional statistical training programme, clearly falls under the capacity category:

- Ensure that the capacity exists within the region to provide statistics-related training, which directly enables statistics producers to improve the quality of the statistics produced and for users to improve the quality of their analysis based on the statistics provided.

The biggest challenge in developing a statistics activity is ensuring that there is a clear explanation of **how the planned outputs will contribute to achieving the results** (specific objectives). This is especially important in statistical capacity building.

At the **operational objectives** level, the following common types of outputs can be identified, which together correspond to the range of statistics-related problems:

- **Strategy:** Strengthen the relationship between statistics and decision makers, which is vital for evidence-based policy making and good governance; set medium term strategy to meet policy-oriented goals. This process should be country-led and country-owned. (Section C.7.1 considers policy-level relations and statistics strategies.)
- **Framework:** Strengthen the legal and regulatory framework for statistics, develop and strengthen interinstitutional relationships. In particular, access to and use of public registers and other administrative data sources and the plethora of new public and private data sources (including 'Big Data') encompassed by the 'data revolution' term, is a challenge that needs to be addressed by a modernised legal framework. (The legal and regulatory framework for statistics is central to the fundamental principles for official statistics, as described in section B.2.1. It is considered in the context of national statistical strategies in section C.7.1, and is also a key issue for the assessment of national statistical systems as described in section C.6.1.)
- **Capacity:** Strengthen the national / regional capacity to develop, maintain and disseminate quality statistical information required to formulate, implement and monitor policies. This is generally the main activity in implementing an NSDS (or a Regional SDS) – see chapters C.6 and C.7. Often, the focus is directed at the capacity to produce the indicators of the SDGs global monitoring framework – however, this should clearly also be viewed in the context of national development priorities and the information needs for defining and monitoring these.
- **Capacity / Harmonisation:** Develop the international comparability of statistics, based on international standards, nomenclatures, methodological frameworks, accounts systems etc. (Capacity building is considered in section C.7.2.) (In some cases, this requires harmonisation with the European Statistical System (ESS). Harmonisation with ESS standards is identified separately as it is the specific purpose of some European Neighbourhood Policy statistics actions.)
- **Users:** Strengthen the capacity of stakeholders to access, analyse and interpret the statistical data produced.
- **Production support:** Provide direct support to produce and disseminate specific statistics. Direct support for data production and dissemination is usually for population censuses and large-scale surveys, where external support is appropriate due to their cost.

Indicators and sources of verification:

- At the project purpose level, indicators should relate to the publication of statistics and metadata at country (or regional) level, as well as through international data portals. In capacity building actions, it should usually be indicated whether information has been loaded in the IMF's 'Enhanced General Data Dissemination System' (e-GDDS) portal (see section B.2.1 and section B.2.4) – however, it should be kept in mind that this mainly focuses on economic statistics. For SDG-related actions, it should be highlighted whether the national data have been included in the UN SDG Global Database. For statistics users, published analyses of statistics should be highlighted.
- At the results level, indicators should relate to the application of the activity outputs. This is particularly important in capacity building activities. For example, in the case of training in statistics: what is the plan to apply the training received, for example in changing statistical nomenclature, use new software or more advanced versions, implementing a new version of the System for National Accounts etc.? Have the former statistics students been employed to produce and disseminate official statistics? In the case of internal training activities within the national statistical office (NSO) and/or NSS, do the training participants remain within the organisation after the training (e.g., on a one-, three- or five-years horizon)?
- Output level indicators are relatively straightforward: training materials, attendance lists, trainers' reports, student evaluations etc.

To find out more…

- European Commission, DG International Partnerships: Managing a project
- Evaluation of the Commission Support for Statistics in Third Countries (2007)
- European Commission Staff Working Document SWD(2018) 444 final: A Revised EU International Cooperation and Development Results Framework in line with the Sustainable Development Goals of the 2030 Agenda for Sustainable Development and the New European Consensus on Development (2018)

C.8.3. Providing European Commission support for statistics

C.8.3.1 THE EUROPEAN COMMISSION'S IMPLEMENTATION INSTRUMENTS AND STATISTICS

Support to statistics can be applied through any of the various types of instruments used in European Commission development cooperation.

- Classic **projects** focussed on statistics tend to create large demands on Commission management time, relative to the size of the project. Nevertheless, they are still used where there is no alternative.
- **Sector-Wide Action programmes (SWAps):** A SWAp is a programme-based approach applied to a particular sector, such as education, health or agriculture. This will support a sector development programme (SDP), which is *"a single comprehensive programme and budget framework, comprising a specific, time-bound and costed set of actions and activities within a sector"* such as, in the case of statistics, an NSDS incorporating both government and donor resources[1].

1 Definition from PARIS21: A Guide to Using a System-wide Approach to Implement National Strategies for the Development of Statistics (NSDS)

- A **sector-wide programme for statistics** may or may not form part of a wider government or planning system reform. The aim is to improve the statistical and analytical capacity needed in key ministries. The approach provides for a general reform of the statistical function, including capacity building measures.
- **SWAps for education, health or other sectors** may contain a statistics element. This is perhaps the more common of the two approaches. For example, agriculture statistics may be one of the problems to be addressed within the rural development focal area.

- **Budget support programmes** typically have a capacity building component that can be mobilised to support the strengthening of statistical systems, either through project modality, technical assistance, or pooled funding.

C.8.3.2 EUROSTAT'S ROLE IN SUPPORTING STATISTICAL CAPACITY BUILDING IN THIRD COUNTRIES

Eurostat is the longest existing regional statistical organisation in the world. Eurostat has considerable experience of developing harmonised statistical approaches across a region and in developing approaches to improve the quality of statistics from production to dissemination.

Eurostat has actively supported statistical capacity building for many years, both at regional and national level throughout the world, either bilaterally or through financial support to organisations such as PARIS21. Experience has shown that activities and support at regional and sub-regional level has the greatest impact, through multiplicator effects and peer-to-peer learning central to building capacity throughout the countries of the region and assuring sustainability of the progress made. Eurostat supports capacity building efforts in partner regions and countries through:

- Promotion of standards, methods and procedures;
- Provision of technical support to regional level statistical organisations across the world;
- Promotion and participation in regional international forums.

The legal basis for preparation of the 'European statistical programme' is Regulation (EC) No 223/2009 on European statistics. It provides the framework for the development, production and dissemination of European statistics.

The European statistical programme 2021-2027 is part of the European Commission's 'Single Market Programme' for this period (Regulation (EU) 2021/690). Annex II covers the multiannual work programme for European statistics. This is further detailed in the Annex on European Statistics of the annual Work Programmes of the Single Market Programme, laid down by a Commission Implementing Decision for each year. Regarding international cooperation, Annex II on European statistics of the 'Single Market Programme' stipulates that the following action shall be carried out: *"continuing the cooperation with international organisations and third countries for the benefit of global official statistics."*

To find out more…

- DG International Partnerships: Budget support (website including links to the European Commission Communication COM(2011) 638 'The Future Approach to EU Budget Support to Third Countries' and updated Budget Support Guidelines (2017))
- Eurostat: Section on the Statistical programmes of the European Statistical System
- Regulation (EC) No 223/2009 of the European Parliament and of the Council of 11 March 2009 on European statistics (consolidated text)
- Regulation (EU) 2021/690 of the European Parliament and of the Council of 28 April 2021 establishing a programme for the internal market, competitiveness of enterprises, including small and medium-sized enterprises, the area of plants, animals, food and feed, and European statistics (Single Market Programme) (see Annex II on European statistics)
- Eurostat: International cooperation – Overview
- Eurostat: International cooperation
- Eurostat: International cooperation – European Neighbourhood Policy (ENP) countries
- Eurostat: International cooperation – Candidate countries and potential candidates (Enlargement countries)
- Eurostat: International cooperation – Pan African Statistics Program (PAS)
- Eurostat: International cooperation – International statistical cooperation tools
- Evaluation of the Commission Support for Statistics in Third Countries (2007)

Eurostat statistical cooperation first point of contact:

- ESTAT-STATISTICAL-COOPERATION@ec.europa.eu

C.8.4. European Commission types of action in statistics

C.8.4.1 OVERVIEW

This section looks at types of statistics actions that the European Commission is often involved in, in order to identify:

- The relation of policies to statistics-related actions;
- European Commission areas of experience; areas where the Commission finances statistics but is not technically involved;
- Examples of current and recent interventions;
- Action points specific to each type of action.

European Commission support for statistical interventions can be categorised into:

- System-wide support at national level;
- Large-scale operations (e.g., population censuses, household surveys);
- Sector statistics intervention, capacity building and / or support for specific statistics production;
- Strengthening regional statistics.

Box C.8.2: Action points for statistics interventions

Diagnosis

- The diagnosis of problems and priorities should be drawn from a statistics strategy or should be developed as part of the intervention – see section C.8.1

Strategy

- The statistics strategy (e.g., NSDS) on which the intervention is based must link to the national poverty reduction strategy / national development plan – see section C.7.1.
- The statistics that are expected to result from the action must be defined by their use: the policies to be prepared / monitored / evaluated.
- There needs to be a clear analysis through the logframe (see Box C.7.20 for an example) that shows how the problems diagnosed will be addressed by the planned activities – see section C.7.2 and chapter C.9.
- As well as ensuring clear links with the development objectives of the partner countries, national statistics institutes should have the lead at the formulation stage.

Design

- The level of disaggregation of statistics required (e.g., geographic localisation, gender-specific statistics) should be determined by the policy objectives and needs to be specified in general terms as an output. This is not a technical issue. Many of the SDGs indicators require such disaggregation, e.g., by sex, by rural versus urban population, by specific disadvantaged groups etc.; this is often a great challenge for national statistical offices in partner countries.
- Support for the use of statistics needs to be incorporated into statistics actions and its implementation monitored.

C.8.4.2 SUPPORT TO THE WHOLE STATISTICAL SYSTEM AT NATIONAL LEVEL

A strategic approach to statistics development aims to support a locally owned and led programme to develop the NSS in a comprehensive and co-ordinated way, typically implementing a NSDS and using country systems and procedures for implementation.

Key components of the system-wide approach are:

- A clear nationally-owned policy, strategy and programme for official statistics;
- A medium-term expenditure framework that reflects the long-term strategy;
- Systematic arrangements for programming resources;
- A performance monitoring system that measures progress and strengthens accountability;
- Broad consultation mechanisms that involve all stakeholders, including mechanisms for dialogue and coordination across the NSS;
- Partner government-led processes for donor coordination and dialogue;
- An agreed process for moving towards harmonisation of procedures for budgeting, financial management, procurement, and monitoring and evaluation.

The policy objective of these interventions is often related to governance. Activities include, but are not confined, to statistical capacity building, including:

- Revision of statistical legislation;
- Relations with political level;
- Statistical infrastructure;
- Organisation of the NSS, notably coordination of methodologies and establishing a distribution of responsibilities;
- Management of the national statistical office;
- Direct support to statistical production and dissemination can be included.

This approach responds to beneficiaries' need for support in management and coordination of the statistical system as a whole. In order to ensure sustained political level support and provide a complete diagnosis of the system problems, a statistics strategy such as an NSDS (section C.7.1) should exist.

Some examples of European Commission programmes that include support for the NSS as a whole:

- **Niger:** Programme to support the development of the national statistical system for the promotion of governance and monitoring / evaluation of poverty (PASTAGEP) funded by the European Union (2012-2015). It fell within the framework of support for the implementation of the Action Plan of the National Policy of Civil Registry System in Niger.
- **Eritrea:** Governance and public finance management (PFM) was on the agenda of the National Indicative Programme 2014 to 2020 of the Eritrea-EU cooperation (11 EDF). The programme focused on macro-economic planning and management (general statistics, regulatory framework, employment, and productivity), public financial management (audit, financial statistics, fiscal policy), and the implementation of recommendations accepted by the GSE.

Box C.8.3: Action points for system-wide statistics interventions

- In system-wide interventions, there is usually a need to address the legal and regulatory framework and the overall coordination of the NSS. Past European Commission projects have often omitted this. The national statistics strategy evaluates this issue.
- There is a need to improve coordination and exchange of information between producers of statistics across the NSS and between national and regional institutions.
- Dissemination and promotion of statistical information needs to be addressed at the design stage by system-wide actions.
- A constraint on population censuses and system-wide statistics actions is often capacity, either a lack of trained personnel or even a lack of potential personnel with appropriate education.

To find out more…

- PARIS21: Guidelines for National Strategy for the Development
- of Statistics (NSDS) (web version — updated annually)
- PARIS21: NSDS 2.0 in a Nutshell
- PARIS21: A Guide to Using a System-wide Approach to Implement National Strategies for the Development of Statistics (2007)

C.8.4.3 SUPPORT FOR LARGE-SCALE OPERATIONS

The largest-scale statistics operations are population censuses. The main sources for advice and support for population censuses are the World Programme on Population and Housing Censuses, the United Nations Population Fund (UNFPA) and the UN Statistics Division Census Knowledge Base.

Some examples of European Commission support to large scale operations such as population and housing censuses:

- The Census 2012 in **Zimbabwe**
- The **Myanmar** 2014 Housing and Population Census.

C.8.4.4 SECTOR STATISTICS SUPPORT AT NATIONAL LEVEL

Sector statistics interventions aim to ensure that statistical information is available for preparing, monitoring, and evaluating sector policies. While there can be a focus on ensuring that indicators for sector budget support are available, it is important that the statistics intervention is viewed as producing data for national use according to national priorities. Sector statistics interventions are often mounted as relatively small parts of sector-wide programmes. Sector statistics are addressed in greater depth in parts D – G of this Guide.

Box C.8.4: Action points for sector level interventions for strategy development

- The national statistics strategy remains relevant at sector level.
- Institutional links between national statistics institutes and 'line ministries' vary greatly in quality. In principle, these relations should be addressed by the statistical strategy.
- Administrative information can be held within ministries, institutions (schools, hospitals) or other organisations (e.g., private aid bodies). Access to this data and possible support for its improvement may need to be addressed at the decision-making level.

Box C.8.5: Action points for sector level interventions to avoid duplicate surveys

- Duplicate surveys are two or more surveys in the same sector or policy field that are separately organised, not coordinated in time and which ask similar (but usually not the same) questions. Consequently, they produce differently classified data, most commonly on different geographic classifications. The resulting data is usually not comparable or only comparable to a limited extent.
- Duplicate surveys can arise as a result of demands by donors for data that have defined characteristics or, at worst, must be produced by a specified survey. Most donors in statistics have made undertakings that should permit elimination of these practices. The emphasis on joint planning and joint implementation stipulated by the European Consensus on Development should be an important driver for better coordination and avoiding duplicated work. The same is the case with the focus on national ownership of development strategies and the central role of national statistical strategies (NSDS or other) in planning statistics activities.
- However, duplicate surveys that have external funding can be a means for statistics producers to support the incomes of their staff where core wages are insufficient.
- Duplicate surveys can only be eliminated definitively when both underlying conditions are removed.
- Survey seeking behaviour by statistics producers can be reduced by ensuring that the statistics system's finances do not depend on donor-supported surveys and that remuneration is comparable between statistical staff of similar grades whether they participate or not in surveys.

Some examples of European Commission programmes involving support for sector statistics:

- **Tajikistan:** Technical Assistance to support the Strengthening of the Health Information System (2012-2016). The project purposes were: to integrate reliable, relevant and timely routine data with essential statistical data from other sources i.e., civil registration, national statistical office, and vertical programmes, for effective management; to establish the organisational framework needed to ensure high standards of data quality accessible from an integrated data warehouse; to establish effective monitoring and evaluation mechanisms, based on evidence, for assessing health system performance.
- **Central African Republic:** The European Commission contributed to improve the school system and guarantee access to primary school to over 191 000 pupils in the Central African Republic by 2018, exceeding the target that had initially been set. The situation in the education sector had deteriorated following the 2013 conflict and successive crises. After 2013, more than a third of all schools had been damaged or occupied by armed groups. The EU intervention also helped ensure capacity building at the Ministry of Education to achieve coherent policies and planning and a reliable statistical system for the education sector in the country.

C.8.4.5 STRENGTHENING REGIONAL STATISTICS

Regional integration requires comparable statistics to inform common regional policies. The regional statistical capacity approach provides economies of scale and good results in terms of harmonisation, comparability and exchange of methods and data. It also provides opportunities for building and strengthening regional networks within specific statistical domains and for exchange of experiences and good practices in a peer-to-peer context. The European Commission has supported regional statistical capacity for regional integration, from the early TACIS and MEDA programmes to recent programmes such as MEDSTAT IV, PAS II, and the statistical component of ARISE Plus, in cooperation with regional and sub-regional organisations such as the African Union, ECOWAS, UEMOA, CEMAC, COMESA, EAC, SADC, PALOP, CARICOM, MERCOSUR, CAN and ASEAN. Regional statistical interventions are described in more detail in section C.9.6.

Informing **regional policies** to encourage free trade areas and customs unions led to support for statistics interventions in **international trade**. **Economies of scale** and an interest in developing the use of **common statistical concepts** led to support for **statistical training** at regional level. These areas, as well as **national accounts**, where the adoption of common concepts is also important, have been consistent areas of European Commission regional statistics interventions. As regional policy interests widen, such as the interest at regional level in the SDGs and their indicators (see section B.4.1.1) and the need for **multilateral surveillance data** for monetary unions, so the range of regional statistics actions has broadened. Nevertheless, the focus remains on economic statistics such as external trade, price indices and national accounts.

Common regional statistics actions have often been based around development and implementation of common statistics tools, such as **Eurotrace** for international merchandise trade and **ERETES** for national accounts (see section C.9.9). The emphasis is now placed on production and dissemination of the statistics concerned. Statistics related training forms an important part of capacity development for statistics (see section C.7.2).

Some examples of recent and on-going large, multi-annual EU financed regional programmes supporting statistical capacity development aimed at strengthening the ability to produce good quality official statistics:

- **Pan African Statistics Programme (PAS I, 2016-2021)**: In January 2016, Eurostat and the Statistics Division of the African Union Commission (AUC) launched the Pan African Statistics Programme as part of the broader EU-funded Pan African Programme, to develop institutional and statistical capacity in the African Statistical System (ASS). The programme supported the implementation of the Strategy for the Harmonisation of Statistics in Africa (SHaSA). In particular, it supported the ASS in implementing its integration agenda and provided support to the newly established Pan-African Institute for Statistics (STATAFRIC). The support was delivered through technical assistance to increase the availability and quality of data produced by the ASS, statistical capacity building through regional trainings and workshops for staff in Regional Economic Communities and NSOs, institutional capacity building through quality assessments and peer reviews, and technical assistance to STATAFRIC.
- **Pan African Statistics Programme (PAS II, 2021-2025):** as part of the broader Pan African Programme, will continue the support in developing institutional and statistical capacity in the ASS. Through more synergy with other international organisations and EU Member States, it is expected that PAS II will contribute to the collection and analysis of reliable and harmonised statistics, to their dissemination and communication, and to the enhancement of the institutional and coordination capacity of the ASS.
- **MEDSTAT programme**: MEDSTAT is the first EU regional statistical cooperation programme with the EU's Southern Neighbourhood. The programme was set up to reinforce the capacity of the Southern Neighbourhood countries to develop, produce and disseminate harmonised and comparable data, in line with European and international standards. MEDSTAT has had four phases: MEDSTAT I in 1996-2003, MEDSTAT II in 2006-2009, MEDSTAT III in 2010-2013 and MEDSTAT IV in 2016-2019. MEDSTAT has:
  - contributed to significant progress in the production, availability, quality and comparability of statistics in the region;
  - resulted in common methods, tools, knowledge platforms and regional publications;
  - established an extensive network of statisticians and experts in the region;
  - brought both statistical decision-makers and experts from the region to the same table, to share and discuss issues related to statistics, together with their EU counterparts.

The fifth phase, MEDSTAT V, which will run from 2022 to 2025, builds on the achievements of the previous phases as well as responds to both remaining and new challenges. The programme, which is managed by Eurostat, continues to support the national statistical institutes and systems of the Southern Neighbourhood countries to develop and produce reliable and comparable statistics, in line with European and international norms and standards. It is expected to strengthen further the capacity of the Southern Neighbourhood countries' statistical systems to produce and disseminate more and better-quality data in support of evidence-based decision-making, improved governance and democracy. These data will also help the EU to plan and monitor its policies towards these countries.

- **ASEAN Regional Integration Support by the EU (ARISE Plus, 2017-2022):** ARISE Plus consolidated and enhanced the results achieved with earlier EU-ASEAN technical assistance programmes to support the ASEAN Economic Community (AEC) Blueprint 2025, thus supporting greater economic integration in ASEAN and strengthening its institutional capacity. Among its objectives was to

strengthen institutional capacities for managing the integration process, with an emphasis on ASEAN economic integration monitoring and statistics. This included the operationalisation of the ASEAN Economic Community (AEC) 2025 monitoring and evaluation framework and strengthening the coordination role of ASEAN Community Statistical System (ACSS). Activities covered technical cooperation, advisory services, seminars and workshops, training courses and institutional strengthening, including ICT development.

Box C.8.6: Action points for regional statistics interventions

- Regional organisations need to have an explicit statistics strategy and prioritisation.
- Preparation of regional integration actions, including definition of priorities, needs close collaboration with the regional institutions, but the national statistical institutes of the member states of the regional institution must also be positively involved in preparation.
- Regional interventions may require complementary actions at national level.
- Data communications between regional organisations and their member states are likely to become of increasing importance for new actions.

To find out more…

about European Commission and Eurostat support to regional statistics

- Eurostat: International cooperation – Overview
- Eurostat: International cooperation
- Eurostat: International cooperation – International statistical cooperation tools
- Evaluation of the Commission Support for Statistics in Third Countries (2007)

about the Pan African Statistics (PAS) programme (EU support to statistics in the African Union)

- Eurostat: International cooperation – Pan African Statistics Program (PAS)
- Eurostat: Pan African Statistics Programme II, Eurostat presentation to the 9th meeting of the Forum on African Statistical Development (FASDev) 14.12.2020
- Pan African Statistics (PAS) programme: Peer reviews of NSIs/NSSs in African countries: proposed methodology (draft) (2016)
- Pan African Statistics (PAS) programme: Pan African Statistics programme - presentation leaflet
- African Union: Pan-African Institute for Statistics (STATAFRIC)

about MEDSTAT (EU support to statistics in the ENP-South/Mediterranean region)

- Commission Implementing Decision C(2020) 7372 final of 29.10.2020 on the annual action programme part II in favour of the European Neighbourhood Instrument (ENI) South countries for 2020 - Annex 2: Support to the statistical systems of the Neighbourhood South countries (MEDSTAT V)
- Eurostat: Statistical cooperation - European Neighbourhood Policy-South (ENP-S) and MEDSTAT programme (Statistics Explained articles)
- Eurostat: ENP-South statistical cooperation and MEDSTAT

about ARISE Plus (support to statistics in the ASEAN region)

- ASEAN: ARISE Plus providing technical support for ASEAN economic integration and ARISE Plus Component 4: ASEAN Economic Integration Monitoring and Statistics
- ASEAN: ASEAN Regional Integration Support from the EU (ARISE Plus) presentation brochure
- Delegation of the European Union to ASEAN: ASEAN, EU launch flagship programmes on policy dialogue and economic integration (press release; 2018)
- European Union External Action Service (EEAS): Strengthening EU-ASEAN partnership, an urgent necessity (EEAS blog by EU High Representative Josep Borrell; 2020)

C.9 How to manage statistics actions

C.9. How to manage statistics actions

The chapter in brief

This chapter starts at the point when the decision has been taken that a European Commission statistics intervention is justified in order to achieve the goals agreed with its development partners. It gives guidance on how to prepare the various types of projects/programmes to support statistics capacity development and major statistical projects. It also provides practical advice for preparing and evaluating terms of reference at each stage of project/programme preparation; this also includes key points for terms of reference.

The first half of this chapter builds further on the information and discussions already presented in chapter C.8, chapter C.7 and chapter C.6. In particular section C.8.2 'Matching outputs to objectives: the logical framework of a statistics action' provides the basis for the discussion of the different phases of the project cycle for statistics interventions.

The second part of this chapter provides further information on some specific topics of high importance for statistics programmes and projects and for statistical capacity development in particular. These topics include support to the development strategies, management and advocacy for official statistics, support to regional statistical programmes, training and IT for official statistics, as well as support to methodological developments.

C.9.1. Identification / Pre-feasibility

The background for this section is the situation in which:

- Absent or poor-quality statistics that do not permit policy measures to be adequately prepared, monitored and evaluated become a significant constraint to achieving policy goals. The goal of overcoming this constraint has normally been incorporated in the country's development strategy and the relevant programming documents (section C.8.1)
- The purpose of an intervention has therefore been outlined in these documents (see sections C.8.1 and C.8.2)

The key outputs of a statistics identification or pre-feasibility study are:

- The intervention's specific objectives are clearly defined: which results are needed to achieve the purpose laid out in the strategy and programming documents?
    - Section C.8.2 discussed the three types of specific objectives common to all European Commission statistics interventions: improvement in statistics production, development of statistical capacity and improvement in the use made of statistics. One or more of these objectives might be relevant.
    - Alternatives for the operational objectives to be delivered by the project / programme are discussed, with a preferred option identified. Section C.8.2 discussed the six common output types at operational objectives level, namely to strengthen: 1) the relationship between statistics and decision makers; 2) the legal and regulatory framework for statistics; 3) the national/regional capacity to provide quality statistics; 4) the international comparability of statistics; 5) the capacity of stakeholders to analyse and use the statistics, and; 6) support to produce and disseminate specific statistics (e.g. censuses, large-scale surveys).
- A first view of the activities to be undertaken. These will be dependent on the nature of the problems identified, and may e.g., involve actions related to the connections and communications between policy makers and statistics producers, the legal/regulatory framework, interinstitutional relationships, establishment or improvement of relevant registers, training to acquire required knowhow, technical equipment (hardware, software, buildings, network and internet connectivity) etc.
- Analysis of the linkages between the activities, operational objectives, the expected results, and the project purpose. This is particularly important for capacity development projects, where the achievement of planned outputs may or may not lead to the expected results. The analysis should be as complete as possible at this stage and include:
    - The risks and uncertainties, together with the strategy proposed and assumptions made.
    - A first appraisal of means and costs;
    - A first analysis of the financial, coordination and implementation procedures.

Box C.9.1 provides a checklist that covers drafting Terms of Reference and evaluating responses for identification or pre-feasibility studies.

Box C.9.1: Terms of reference checklist for a statistics identification or pre-feasibility study

This box provides information both on preparing terms of reference for a study and on response evaluation. It is intended to be applied not only in traditional programmes / projects but also in sector-wide programmes, contribution agreements and in actions related to budget support.

1. Study background

Terms of Reference should contain:

- A description of the role of the sectors concerned in the overall programme and the anticipated use of the statistical information that motivates the intervention.
- The discussion should reflect the context of the current international standards and principles such as aid efficiency and transparency and be in line with the Cape Town Global Action Plan for Sustainable Development Data and the Addis Ababa Action Agenda (chapter B.1) and any NSDS, RSDS or other relevant statistical strategy document (section C.7.1).
- Political sensitivities that can have statistical implications should be outlined.
- Any required institutional framework for the intervention and the likely administrative framework (e.g., budget support, contribution agreement) should be specified, administrative interlocutors should be identified.

2. Study objective

The objective of the study is to identify and outline how the need for statistical information expressed in the development strategy, programming documents or statistical strategy documents can be met in the best way. The technical proposal should therefore contain:

- Decision criteria in terms of relevance, sustainability, and feasibility for whether the preferred option should be accepted.
- Evaluation of technical alternatives. For some large-scale surveys, the final choice of technical alternatives is preferably left to the feasibility / formulation stage.
- Capacity development alternatives: the evaluation should consider the impact of different approaches on the sustainability of the production and dissemination of the statistics. The relevance and likely effectiveness of the capacity development measures should also be considered.
- Frequency and means of technical reporting and monitoring.

3. Issues to be studied

The technical proposal should show how the following issues will be assessed and should identify associated risks and assumptions:

- Confirmation of intervention coherence with strategy / planning documents agreed with European Commission and with the relevant statistical strategy, such as an NSDS for an intervention limited to one country (section C.7.1).
- A statistics intervention is relevant if the results are likely to inform policy decisions in the sector(s) concerned.
- Sustainability, as a proposed intervention will most likely be rejected if there is a perceived or actual lack of sustainability of the statistics resulting from the intervention.
- Technical alternatives: choices with respect to the statistical methodology and approach. These alternatives often concern whether international standards are followed or not and/or how far the statistics can be disaggregated, in particular with respect to disaggregations required by related SDGs indicators (by gender, age group, rural vs urban, etc.).
- Capacity alternatives: even in an intervention that aims primarily at improving the coverage and quality of statistical information, there are alternative levels of associated capacity development. The capacity development associated with an intervention also depends on the absorption capacity of the beneficiary.

4. Methodology

The proposed methodology for the statistics identification or pre-feasibility study should ensure that there is sufficient information available to address the points covered in points 2 and 3 above.

The assessment of the National Statistical System (NSS; see section C.6.4), for example using Eurostat's 'Snapshot tool' (see Box C.6.2), provides a system-wide checklist to assess what is lacking and what is required in order to produce quality statistics. This can be focused on specific sectors where appropriate. For proposed statistics interventions in specific sectors, see the respective sector chapters in part D – G of this Guide.

The assessment of the NSS should focus on issues related to the unavailable (or unreliable) statistics that make policy formulation, monitoring and evaluation difficult. It should at least cover the following issues (see also section C.6.2):

- Technical aspects of statistics production (methodology, organisation, data processing tools and procedures, work schedule, technical and human resources).
- Capacity development: examination of the links between actions and results, and the need for development of a National Strategy for the Development of Statistics (section C.7.2).
- If possible, address the unsolved technical problems. If this is not possible at this stage, a thorough technical study must be done within the formulation study.
- Identify supports to statistics within related domains; experiences drawn from these supports; potential regional co-operation projects in which the partner country has been involved.
- Analysis of the overall budget, of the envisaged mechanisms of coordination and management.
- In the statistical domain, the methodology section should always plan:
  - Meetings and contacts with users and stakeholders (e.g. in form of workshops).
  - Examination of the last National Statistical System publications (paper, electronic and online).

Expertise Required

Experience in institutional and technical aspects of official statistics, plus knowledge of the administrative environment, will be preferred to in-depth technical expertise in statistics.

To find out more…

- European Commission, DG International Partnerships (DG EuropeAid at the time): Institutional Assessment and Capacity Development (2006)
- European Commission, DG International Partnerships: Managing a project
- Evaluation of the Commission Support for Statistics in Third Countries (2007)
- European Consensus on Development (2017)
- European Commission Staff Working Document SWD(2018) 444 final: A Revised EU International Cooperation and Development Results Framework in line with the Sustainable Development Goals of the 2030 Agenda for Sustainable Development and the New European Consensus on Development (2018)
- Regulation (EU) 2021/947 of the European Parliament and of the Council of 9 June 2021 establishing the Neighbourhood, Development and International Cooperation Instrument – Global Europe
- DG International Partnerships: Global Europe: Neighbourhood, Development and International Cooperation Instrument
- European Commission – DG International Partnerships: European development policy; see in particular the sections on the European Consensus on Development, Development effectiveness and Policy coherence for development
- European Commission – DG International Partnerships: Joint Programming
- European Commission – DG International Partnerships: Effective development cooperation – Does the EU deliver?
- European Commission: Policy Coherence for Development 2019 EU report
- European Commission – DG International Partnerships: Aid transparency; Strategic evaluations – Assessing the quality of EU development aid; Project and programme evaluations
- European Commission: Better Regulation Toolbox chapter 3 (which contains, among other things, Tool #35 Developing countries
- European Commission Communication COM(2011) 638 final: The future approach to EU budget support to third countries (2011)
- European Commission – DG International Partnerships: Budget Support Guidelines (2017)
- European Commission – DG International Partnerships: Budget support
- Commission Staff Working Document SWD(2015) 198: Collect more – Spend better: Achieving development in an inclusive and sustainable way

C.9.2. Feasibility / Formulation

This step aims to confirm the project's relevance and feasibility and to produce a detailed plan. The project's intended partners should play a fundamental role at this step. A **design study** may be at the core of the work performed at this step.

Again, this study should focus on the following elements:

- Achievement of the analysis of the institutional capacity of the concerned statistical service or of the whole national statistical system.
- In-depth analysis of the problems, varying according to the type of project (global capacity development, sectoral assistance, participation to a wide-scope statistical operation).
- Consistency with other ongoing or planned supports.
- Precise definition of overall objectives, specific objectives, results, and activities.
- Role of technical assistance in the implementation; definition of the terms of reference for consultancies. (Technical support usually takes the form of either a transfer of competence to the beneficiary institution's staff or of provision of additional human resources.)
- The partner's ability to absorb the technical advice, including the detection of potential negative effects of technical assistance on the whole NSS (see section C.9.6).

Box C.9.2: Elements for terms of reference of a design study for a statistical project

Background for the assignment

Put the mission back in the context of development aid efficiency and transparency and the partner country's development strategy and results framework, as well as of the satisfaction of the users of statistics: specify whether the project is initiated and managed by the national/regional partner or whether it results from a request from external donors (the European Commission especially).

Specify the type of statistical support requested: global statistical capacity development, statistical assistance within the framework of a sectoral programme or a specifically dedicated project, participation to a large-scale statistical process.

Specify the role of the NSS during the mission, in particular which NSS body will be involved.

Lay out the trends agreed by the European Commission and the partners at the end of the identification phase.

Objectives of the mission

Provide information allowing to make a decision on the idea of the suggested statistical support project (acceptance, refusal, modification) and to communicate all technical and financial items necessary for the preparation of a financing convention.

Issues to be studied

Analyse the coherence of the proposed project with the development strategy and the statistical development strategy of the partner. The analysis should consider lessons learned from previous interventions in the partner region/country or addressing similar challenges in other regions/countries, though evaluations, impact analyses, result-oriented monitoring exercises etc.

Analyse the future project stakeholders, their motivation, institutional power, relationships, internal structure, and management ability. In the course of the study, the degree of cooperation and coordination between the NSS stakeholders must be accurately evaluated. If a project aims to support sectoral statistics, the relations between the statistical service in charge of producing the sectoral information and the institutional stakeholders concerned should also be analysed. In addition, data users (institutional, private as well as the general public) should be taken into account.

- The users: who are they? What do they think of the available data? What is their image of the NSS/NSI? How do they express their requests? What are their relations with the NSS?
- Structure, organisation and co-ordination of the NSS. Legal framework for statistics and political influence on statistical activities, independence of NSS.
- Status and organization of the NSI/statistical services involved in the project: type of management, mission, strategy, planning of work, monitoring and evaluation, administrative and financial management (procedures, reporting), staff management (job description, payment, recruitment, skills, motivation).
- If necessary, statistical role of the regional organisation vis-à-vis its members states (mission and practice) and co-operation/coordination modes with the governments, organisation and internal coordination regarding statistical activities, means allocated to statistical activities.

To facilitate this analysis, Eurostat has developed a specific tool, 'Snapshot,' to be used by EU Delegations or other interested partners. The Snapshot analysis can be complemented by other sources of information, such as a recent peer review (see section C.7.4.5. for further information about support to peer reviews, for example through the Pan African Statistics Programme (PAS I, 2016-2021)).

Identify and analyse the problems to be handled by the project (e.g. SWOT analysis of the NSS/NSI and its statistical processes).

Identify the in-progress or past supports to statistics within the domain or in related domains; experiences drawn from these supports. Check the coherence with other in-progress or planned supports

Check the absorption capacities: due to the implementation of poverty reduction policies, NSSs have been increasingly demanded to set up various surveys. Coordination of these actions is sometimes difficult, because NSIs from less-developed countries have limited methodological and technical means for achieving co-ordination.

Define in a detailed way the global objectives, the specific objectives, the results and the activities. Draw up the logical framework matrix. The implementation of a NSDS is a priority for the development of statistical abilities.

Describe the monitoring system of the project: in case of a regional project, the system used for the follow-up of local level activities must be very well described. The monitoring system should be as integrated as possible into the key partner's own monitoring system. For participation to large-scale projects, the monitoring system will have to be fully integrated into the project's own system.

Identify assumptions and risks. In statistical projects, assumptions and risks often relate to the following matters:

- Delays in the project implementation (e.g. legal framework, provision of national resources).
- Availability and stability of the national statistical teams.
- Perpetuation of the project results.
- Role of the technical assistance at the implementation stage and terms of reference for consultants, especially as regards the transfer of competences towards and the provision of additional human resources for beneficiary institutions (e.g. sub-contracting).

Methodology

In the statistical domain, the methodology section should always plan:

- Meetings with users and project key stakeholders: public institutions, international organisations, trade organisations and major actors in the domain in case of a sectoral project, non-trading companies (political representation, press, NGO).
- Examination of the last National Statistical System publications (paper and electronic/online versions).
- When the study is completed, discuss the proposal of project with the partners. This allows to collect concrete feedbacks and to supplement the information relating to the project ownership and risks.

Required expertise

For this type of mission, the expertise will mainly depend on the type of project considered during the identification stage. A multidisciplinary team should be involved comprising experienced statisticians (also for each domain considered) and an expert in capacity development (with knowledge of the administrative environment in the country).

C.9.3. Implementation

C.9.3.1 START-UP PHASE

Several months (even years) may pass between the collection of information in the field during the formulation phase and the project's effective start-up. Meanwhile, the project background may have been modified by certain events or operations. The information must be updated in the startup phase and potential impacts on the project must be evaluated. If need be, adaptation measures should be taken.

The updating process should include all effective changes regarding:

Global statistical capacity development:

- Legal framework of the statistical activity,
- Work on the National Strategy for the Development of Statistics,
- Organisation and functioning of the NSS and the NSO; functioning of the services producing statistics elsewhere.
- National Statistical Council planned or implemented.

Sector support to statistics:

- List of statistical data collection operations planned in the sector. Such a list may impact the methodology, the collection operations as well as the data processing.
- Other supporting statistical projects related to the sector, started, or planned.

At the end of the start-up phase, the list of activities relating to the project should be updated; this applies also to the work plan. The terms of reference for potential technical advice may be reviewed and complemented.

C.9.3.2 IMPLEMENTATION PHASE

The project team should pay close attention to the timeliness of project results. In statistical capacity development actions, timeliness is not only dependent on planned actions (training, programmes, procedures, and tools); **timeliness often depends on decisions to be taken or legal acts to be introduced by the beneficiaries**. This includes, for example, the official announcement of a census date. The progress in making such decisions (legislation, regulation, budget, staff, other means) has to be carefully monitored.

In particular, the monitoring system must include the funding mechanism. Indeed, starting up certain tasks requires corresponding financial means to be made available. Large operations often depend on joint financing or on national budget participation. This could be the case, for instance, for the training of interviewers, printing of questionnaires, interviewers' and controllers' fieldwork. **On-time funding can be crucial**. A late start-up of certain tasks may substantially impact survey results. For example, the choice of the observation period of household expenses depends on civil and religious holidays; the choice of the observation period for harvesting depends on the agricultural cycle. As a consequence, **any delay in finalising tasks previous to fieldwork may profoundly impact the quality of information**.

Statistical operations such as surveys or censuses are heavy operations. They involve a number of tasks and require big teams (thousands of people may be mobilized). **Stringent planning and close monitoring are required**. The rules of monitoring, set up during the start-up phase, are an important factor in the operation's achievement. All of the operation's partners and stakeholders should be kept informed.

The data processing and results analysis phases depend on few people in comparison to the data collection operations in the field. Although being near the end of the operation, these phases should be subjected to the greatest attention by the staff concerned. **A statistical operation is not closed until all results have been disseminated and analysed**. It happens too often that only a small part of the survey is really utilized or that a late use makes the information irrelevant.

C.9.3.3 FINAL PHASE

The final phase is essential because it concerns the ownership of the project results. In any kind of statistical project, this phase must include the preparation of the final report and the **archiving of all information**. The importance of electronic archiving should be borne in mind, especially in the case of surveys as, due to their costs, they involve heavy investment. The comparison with older data is of high importance in analysing a survey and in interpreting its results… as far as these data are available!

For projects involving the setting-up of periodic operations of data collection, the **transfer of ownership of the new system to the national team** which will be in charge of the future operations is a very important phase. The future team manager's participation in the project will pave the way for successful national/regional ownership. Such a transfer should be planned in the same way as a service transfer and should include:

- Transfer of **documentation** on the methodology of the survey (design, questionnaire, fieldwork organisation) and on the training of teams;
- Transfer of **information technology** processing and dissemination tools: programmes, documentation and training;
- Transfer of the **data and metadata** that have been collected or produced (as well as archived) during the course of the project;
- Transfer of the **survey report**, with a section devoted to data quality; this transfer is particularly important for the **sustainability** of the project.
- Table of assessment criteria and standards at the implementation step.

C.9.4. Evaluation

The EU has reinforced the role and practice of evaluation in its activities to improve the evidence base of its interventions and policies and encourage a learning culture. The EU's evaluation policy is defined in the document *'Evaluation Matters - The evaluation policy for EU development cooperation'* (2014). Evaluations serve the double purpose of increased effectiveness of international cooperation for development through learning from experiences, while providing more transparency and accountability towards stakeholders and the general public.

Evaluation aims at an as impartial as possible appraisal. It either takes place during the implementation (mid-term) or at the end of the operation (ex post). The evaluation provides an opportunity to learn lessons from the support provided by the European Union.

Strategic evaluations analyse EU strategies from conception to implementation at several levels: country, region, sector, and financing instruments over a longer period. The general overview they provide and their related recommendations serve as basis for the drafting of new policy and programming documents.

Project and programme evaluations are evaluations at intervention level. They are used to assess performance, provide explanatory factors, and gather lessons learned. Project and programme evaluations are the responsibility of EU delegations or of the operational unit in charge of the project or programme evaluated.

The EU has developed and formalised a methodology for evaluating its external assistance in which priority is given to results and impacts. The online 'Methodological bases and approach' wiki presents the methodological guidelines designed to facilitate the move towards an evaluation practice focused on programmes and strategies in European Commission development cooperation.

The **mid-term evaluation** of statistical projects (or programmes with a statistical component) will be carried out if lessons learnt from the first implementation phase could lead to abridging, re-directing or otherwise amending the activity programme. Such an evaluation should be carried out in any of the following cases:

- the implementation is taking a long time (more than two years);
- numerous and complex activities have to be carried out in the frame of the projects or programmes (population census; wide-scope surveys, surveys requiring large samples);
- projects or programmes presenting innovation in the methodology, the data collection methods or even the processing or dissemination phases. In this case, a pilot-study is usually conducted for testing. It is appropriate to make an assessment just after the pilot-study;
- projects or programmes largely depending on decisions to be made or actions to be undertaken by the partner country.

Ex-post evaluations are generally well worth their costs:

- when the European Union's support follows a medium-term approach;
- when the support to statistics is provided as part of a more global sector support;
- when the socioeconomic context is radically changing.

The lessons learnt can greatly enhance the efficiency of the support to statistics.

As for any European Commission project, the assessment criteria used are relevance, performance, efficiency, impact and sustainability. Within each criterion, specificities of statistics which have to be carefully observed are the following:

EVALUATION CRITERIA FOR STATISTICAL PROJECTS

Relevance	Do the project objectives aim at solving the problems identified in the provision of statistical information for the definition and monitoring of development (maybe sector) policies? Are they consistent with the NSDS? Has the analysis of the beneficiaries (within and outside the NSS) been correct in the light of the implementation? The analysis of intra-beneficiary relations and of the institutional context will be verified in a similar way. The risks might be re-assessed.
Effectiveness	Mid-term assessment: do the means committed fit with the effective results? Are the means that have been committed (by the project and by the beneficiaries) comparable to those used in past similar operations (surveys having resulted in similar data or regarding similar domains) To which extent have the stakeholders committed to the monitoring process? How far have they committed to integrating this process in the current process of the implementing institution? Did the project enable the institution to improve in this domain?
Efficiency	Sectoral statistics: are the expected data available? Are they of good quality (or has the quality improved?), in respect to the criteria of statistical quality. Global statistical capacity development: to what extent have the results helped to implement the NSDS?
Impact	Sectoral statistics: what is the appraisal of the sector managers on the project impact? Global statistical capacity development: how deeply did the project impact the rest of the NSS works?
Sustainability	Sectoral statistics: do the ownership of the project results and the beneficiary service resources enable future data production on a periodical basis? Global statistical capacity development: are the results sustainable in terms of NSS human, technical and financial inputs (budget, software and hardware, staff considering the expected turnover)?

An example of terms of reference of an evaluation study in the statistical field, applying to final as well as to midterm evaluation, is given in Box C.9.3.

Box C.9.3: Elements for terms of reference of an evaluation of a statistical project

Background of the assignment

- Put the mission back in the context of aid efficiency and of the satisfaction of the users of statistics: specify whether the project is managed by the national/regional partner or whether it results from a request from the donors (the European Commission especially).
- Specify the type of statistical support requested: global statistical capacity development, statistical assistance within the framework of a sectoral programme or a specifically dedicated project, participation to a large-scale statistical process.
- Prepare a chronological description of the project.
- Specify the role of the NSS during the mission, in particular which NSS body is involved.

Objectives of the mission

- Provide the necessary information for assessing project realisations and drawing the lessons of the project before deducing general recommendations for projects on statistical cooperation.

Issues to be studied

These questions are linked to the seven evaluation criteria retained by the European Commission: relevance, efficiency, effectiveness, impact and sustainability, coherence and added value of the Commission.

Relevance:

- Has the implementation of the project confirmed the initial analysis undertaken in the pre-feasibility and formulation stages?
- Has the project brought an answer to the true needs?
- Had the problems underlying the statistical support been correctly identified during their analysis and do they still reveal to be the true problems? If not, did the project adapt in order to answer to the true problems and needs?
- Has the logical framework been coherent and complete?

Efficiency:

- Have the different activities attained the objectives, at the expected quality and cost levels and according to the initial time schedule? The following issues should be checked: daily monitoring, cost and price to quality ratio, stakeholders' contribution, technical assistance and monitoring.

Effectiveness:

- How have the results allowed reaching the specific objectives of the project?
- Global statistical capacity development: has the behaviour of the NSS vis-à-vis users and data diffusion changed? Has cooperation inside the NSS developed concretely? Has the operating system of the NSS changed? Have these changes brought the expected improvements?
- Sectoral statistical support: are the responsibles (Partners, Delegations) of the sectoral Development programmes satisfied with the statistical data provided: coverage of the field of observation, quality of the data?
- Had the risks been correctly assessed, in particular regarding the adoption of the different regulations, the operating mode of the key partner, the staff's mobilisation?

Impact:

- To what extent has the progress in statistics achieved by the project contributed to improve and develop the "management for results"? Has the follow-up of poverty reduction policies been reinforced consequently?

Sustainability:

- Have the positive effects of the projects been extended beyond the project?
- Have the stakeholders been kept mobilised around the objectives of the project all over its duration?
- Will the authorities respect their decisions vis-à-vis the development of statistical capacities? For example, the commitments undertaken in the framework of the NSDS or pertaining to the change in the NSO's statutes.
- Will the organisation providing sectoral data be able to carry on the production of new data with the same level of quality?
- Computing science playing an important role in statistics, have the technological choices made during the project been relevant? Will the tools be maintained?

Coherence:

- Is the project, in the end, still coherent with the development priorities of the partner, the CSP and with the support of other partners? Supports occurred in the course of the project but not formerly identified should not be omitted.

Value added of the Community:

- To what extent can the contribution of the Community be compared to a similar contribution that would have been provided by one of the Member States of the European Union?

Required expertise

- For this type of mission, it is necessary to combine a double expertise in evaluation and in statistics, completed by a good knowledge of the administrative environment of the countries in the area.

To find out more…

- European Commission and European External Action Service: Evaluation Matters - The evaluation policy for EU development cooperation (2014)
- DG International Partnerships: Work Programme for Strategic Evaluations 2019-2023
- DG International Partnerships: Evaluation methodological approach (wiki website)
- DG International Partnerships: Rapid Assessment for Capacity Development (RAC) (wiki website)
- European Commission: SWD(2018) 444 final A Revised EU International Cooperation and Development Results Framework in line with the Sustainable Development Goals of the 2030 Agenda for Sustainable Development and the New European Consensus on Development (2018)
- European Commission – DG International Partnerships: Effective development cooperation – Does the EU deliver?
- European Commission – DG International Partnerships: Aid transparency; Strategic evaluations – Assessing the quality of EU development aid; Project and programme evaluations
- European Commission: Better Regulation Toolbox; Tool #34 Developing countries
- Commission Staff Working Document SWD(2015) 198: Collect more – Spend better: Achieving development in an inclusive and sustainable way

C.9.5. Support in strategy and management; advocacy

Section C.6.3 demonstrated that support to statistics cannot be reduced only to support in statistical methodology but must be complemented by support in statistical strategy and management.

The 'Evaluation of the Commission support for statistics in third countries' (2007) noted that:

- "Neither the coherence of national statistical systems nor the need for efficient 'statistical coordination' was systematically taken into consideration"
- "No statistics projects or programmes really addressed the design and functioning of the statistical system as a central coherent element of public administration; this resulted in more limited impact on the statistical systems as a whole"
- "Responses that focused only on specific indicators created a risk of fragmentation of the statistical system."

More recent projects correct these drawbacks and introduce elements aiming at:

- improving statistical coordination, in line with the guidelines given un the UN Statistical Division's 'Handbook on Management and Organization of National Statistical Systems' (2021) (see section B.1.3.4) and the experiences gained in the European Statistical System (ESS);
- transforming the NSO into a more autonomous public administrative body, in line with the UN Fundamental Principles of Official Statistics and the respective Statistical Code of Practice or Statistical Charter (see section B.2.1.2);
- providing tools for:
  - the programming of activities (such as the Generic Statistical Business Process Model (GSBPM) and the Generic Activity Model for Statistical Organizations (GAMSO) – see section C.6.3.3);
  - the management of financial resources;
  - the development of human resources (see section C.7.2.2);
- in parallel providing resources to the statistical services of line ministries, in particular the ministries responsible for social affairs, health and education, given their importance in the poverty reduction strategy;
- successfully completing such new objectives requires **non-statistical types of support**, including potential technical advice in:
  - legislation;
  - public administration;
  - budget and external funds management;
  - marketing;
  - strategic planning;
  - human resource management;
  - staff training;
  - communication;
  - foreign languages;
  - etc.

A global strategy has been designed for fragile states and states emerging from critical situations such as crises or wars, in order to take into account their specific situation (see Box C.9.4).

An important effort still needs to be made in **advocacy for the use of statistics** in decision-making. Poor dialogue with data users remains a characteristic of a number of NSSs in partner countries. Improvement of this dialogue should be included in any strategic plan of development of statistics.

PARIS21 has organised several international meetings and developed several tools and resources that can be helpful for national statistical offices that are developing communication strategies and need to develop their communication with the media. Among others, PARIS21 has a programme of training and national workshops to help statisticians better communicate on data and figures as well as to help journalists better understand statistics.

Furthermore, PARIS21 has produced a 'Country-level Advocacy Toolkit' to aid data producers in their dialogue with all partners from the data ecosystem, in particular in the context of the 2030 Agenda for sustainable development. This exchange is a fundamental step in the NSDS design process and is used to advocate, as widely as possible, for statistical capacity development. Further details on how PARIS21 can help with advocacy efforts are outlined in the 'Advocacy at a Glance' leaflet. To aid NSS managers and statisticians in partner countries with their advocacy work, PARIS21 also maintains a large library of advocacy materials from regions and countries across the world as inspiration and reference.

Box C.9.4: Strategies for fragile states and states emerging from critical situations such as crises or wars

Statistical information needs are crucial not only for the definition, implementation, and monitoring of consolidation programmes of fragile states, but also for the programmes of humanitarian aid and reconstruction in countries emerging from crisis and war situations. However, in these countries, valuable statistical information is rare or even missing altogether.

In many fragile countries, administrative structures are failing for total lack of operating budget or lack of staff. The NSS is unable to fulfil its mission and does not produce regular statistical information anymore. Some statistical data may keep being produced, but presenting some drawbacks such as discontinuation of samples or partial geographical coverage due to low security in the fieldwork. Collected data often have little significance. Nevertheless, these operations continue to mobilise people who will be of great help once normal statistical work can be resumed.

In such fragile countries, only surveys are able to respond (often only partially and in limited areas) to the most important information needs regarding poverty. The implementation of light household surveys will enable the capture of household demographic characteristics, income and expenditure data, employment, and unofficial activities. To conduct this work, existing teams within the NSS are called upon.

In countries emerging from crisis and war situations, priority has to be given to promptly gathering the two minimum types of statistical information that allow aid programmes to be defined:

- Information on the state of the population: large moves of population occur during these periods, sometimes leading to a decrease in some age classes (emigration, deaths). Census data do not reflect the country's current situation any longer.
- Information on the conditions of the economic and social infrastructures: transport, public buildings and housing, industrial and commercial infrastructures.

In such cases, it is often impossible to design a heavy data collection campaign such as a census, because the necessary administrative structures no longer exist. Therefore, a demographic survey on a sample of households is generally conducted, complemented by an assessment of the infrastructures on the sample of geographical units to which the selected households belong. Such operations face several difficulties. First, local teams have to be re-constituted to carry out fieldwork, data analysis and the dissemination of results. As far as possible, NSS-experienced staff is favoured. Secondly, it is necessary to build representative samples while the sample frames either no longer exist or are completely outdated. This work is most commonly carried out within the framework of a project linked to the reconstruction programme.

In both cases, the aim is to favour the re-launching of statistical activities as a preliminary step to any reconstruction of statistical capacities. This reconstruction should be part of the general reconstruction programme or support for administrative capacities.

After periods of war or crisis, non-governmental organisations (NGOs) are often the only organisations present in the country. They generally possess data stemming from their internal management that could be used as a basis for roughly estimating the population in their activity area. Before launching any national statistical operation, contact with the NGOs is essential. The information they may provide will be used in defining the survey sample. In the absence of local authorities, they could also relay information about the population.

The UNECE also promote good practices in dissemination and communication by statistical organisations. These include issues such as social media, apps, APIs and open data, digital publishing, credibility of official statistics, statistical literacy, communication with the media, and managing dissemination and communication functions and links to data collection. A key resource is the UNECE's 'Making data meaningful' series, containing four parts covering respectively data storytelling, presentation of statistics, communication with media and statistical literacy.

To find out more…

- PARIS21: Supporting country communications, providing links to helpful tools and resources for national statistical institutes developing a communication strategy
- PARIS21: Guidelines for developing a communications strategy for National Statistical Offices (2019)
- PARIS21: Advocating for the National Strategy for the Development of Statistics – Country-level Toolkit (2010); Advocacy at a Glance (leaflet); library of Country and Regional Advocacy Materials
- PARIS21: Counting down poverty: the role of statistics in world development; Measuring up to the measurement problem: the role of statistics in evidence-based policy-making (2005) and Counting down poverty: the role of statistics in world development (leaflet)
- United Nations Economic Commission for Europe (UNECE): Dissemination and communication
- United Nations Economic Commission for Europe (UNECE): Making Data Meaningful: Part 1: A guide to writing stories about numbers (2009); Part 2: A guide to presenting statistics (2009); Part 3: A guide to communicating with the media (2011); Part 4: A guide to improving statistical literacy (2014)

C.9.6. Regional and sub-regional (multi-country) projects

C.9.6.1 MULTI-COUNTRY PROJECTS

In development cooperation, the terms 'region' and 'sub-region' generally correspond to geographical areas comprising a number of countries. The United Nations defines five main world regions (Africa, Americas, Asia, Europe, and Oceania) and twenty-one sub-regions. The World Bank defines six regions (Sub-Saharan Africa, Europe and Central Asia, the Middle East and North Africa, South Asia, East Asia and the Pacific and Latin America and the Caribbean). The term 'region' can also refer to regional organisations (e.g., ECOWAS, the Economic Community of West African States). (To avoid confusion, one should bear in mind that in national statistics, 'regional' normally refers to sub-national areas (e.g., provinces, states).)

The European Consensus on Development (2017) recognises the importance of regional partnerships for implementation of the 2030 Agenda and for strengthening the statistical capacity to produce and analyse data to inform policy and decision-making, in particular for measuring progress towards the SDGs:

> *"Regional agreements, frameworks, strategies, partnerships and policies in relation to all partner countries will be guided by the Consensus and be based on common goals, principles and values. They will promote the implementation of the 2030 Agenda at regional level with partner countries, including those in Africa, the Caribbean and the Pacific, as well as in Latin America and Asia.*
>
> *[. . .]*
>
> *The EU and its Member States will boost the statistical capacity of partner countries, including through strengthened capacity for the production and analysis of data, to inform policy and decision-making. This data should be disaggregated where possible by income, gender, age and other factors, and provide information on marginalised, vulnerable and hard-to-reach groups, inclusive governance and other issues, consistent with the EU's rights-based approach. It will also include investments in stronger statistical institutions at sub-national, national and regional level, and the use of new technologies and data sources. The EU and its Member States will encourage their partner countries to include the voices of marginalised communities in monitoring the SDGs and to promote concrete mechanisms to this end."*

The increasing regional dimension of European Union statistical projects was already highlighted by the 'Evaluation of the Commission Support for Statistics in Third Countries' (2007). Statistical projects at regional level may:

- support a policy aiming at regional integration;
- meet the political needs of a regional organisation;
- provide support in the context of regional partnership agreements;
- support statistical schools and training centres.

The 'Evaluation' pointed to two factors that were important for the success of regional programmes: the existence of a regional institution serving as a link between the donor(s) and the member countries of the region; and the institutional and technical strengths of the member states' national statistical institutes. The 'Evaluation' recommended that the regional approach should be continued and enhanced, in particular by better utilising the competences and means of regional and sub-regional organizations with statistical responsibilities. The normal project cycle management methodology can be applied to regional statistical cooperation projects. However, throughout the project cycle, matters deriving from their regional dimension have to be taken into account: the mandate of the regional organisation, the capacity of the regional organisation to mobilize a network of national and international stakeholders, the possible existence of a strategy for statistics at regional or at continental level, the expected level of integration and the related statistics needed.

The European Commission's Communication COM(2008) 604 'Regional integration for development in ACP countries' proposed an approach for EU support to regional integration for African-Caribbean-Pacific (ACP) development. This support has been founded on the basic principles of the Cotonou Partnership Agreement (signed in year 2000, extended to November 2021): ownership, dialogue, and sustainable development.

Indeed, the growth of regional bodies has been a significant trend since the 1990s. Across the ACP countries, numerous regional organisations have emerged. The EU and the ACP countries continue to rely on a multi-level system of governance that allows taking action at the most appropriate level (national, regional, continental or ACP), in line with the principles of subsidiarity and complementarity.

Subsidiarity is a key guiding concept for regional development projects and programmes. It is in the interest of all partners involved to deal with issues at the level that will maximise the efficiency and effectiveness of the activities. This is also vital to strengthen the feeling of ownership amongst decision-makers at both regional and national level and strengthening their commitment to the statistical programmes and projects. It is also important with respect to alignment of the statistical programmes and projects with both regional and national development priorities. However, strong coordination and monitoring is crucial to assure that efficiency and effectiveness are realised.

PARIS21 has developed an approach to develop and implement Regional Strategies for the Development of Statistics (RSDS). An RSDS is a masterplan for regional

statistical development, providing guidance to good practice in regional statistical cooperation. It is linked to national and regional priorities and is consistent with the NSDS of the member states of the regional organisation. It is formulated with the objective of responding to specific regional policy objectives, providing an action plan that will meet the information needs of regional integration policies. It should ensure that the statistics from the NSSs are comparable, by applying international standards and good practices.

The RSDS aims at facilitating the development of a regional statistical system, as well as data with a strictly regional dimension (e.g., on climate change or on common water resources). The RSDS is complementary to the national NSDS processes, and vice versa. Success factors are political commitment at the highest regional and national levels, constructive dialogue between data producers and users, availability of required resources and coordination with technical and financial partners. The PARIS21 approach is presented in the booklet 'The RSDS Approach in a Nutshell'. The PARIS21 overview page on RSDS also contains several examples of RSDS: Association of Southeast Asian Nations, CARICOM Community, Comunidad Andina, Pacific Community, Southern African Development Community, South Asian Association for Regional Cooperation.

In its final report 'Coordination of statistical capacity building programmes at the sub-regional level', the Coordinating Committee for Statistical Activities (CCSA) Task Team on Co-ordination at the Sub-regional Level argued that an RSDS should be the basis for co-ordinating donor assistance and for ensuring that development assistance is well targeted. The RSDS should be based on the NSDSs in place, on general regional development strategies and on a detailed assessment of the strengths and weaknesses of the regional statistical system.

C.9.6.2 REGIONAL ORGANISATIONS WITH A STATISTICAL MISSION OR COMPONENT

The motivation and role of regional organisations for development of statistics were presented in section B.2.4.2, which also lists a number of regional organisations with statistical activities (see Box B.2.32). Strengthening regional trade and/or economic development is often the core objective of regional organisations. To monitor this development and evaluate the impact of regional policies, comparable statistics covering all member states of the organisation is required.

Regional statistical cooperation often involves a regional statistical system that operates under a regional statistical steering committee, which is normally composed of chief statisticians from the regional organisation's member states. The steering committee meets regularly to guide the implementation of the regional statistics strategy, statistical capacity development and action plan. In many cases these activities are coordinated and facilitated by a statistics secretariat, often organised as an office or department within the central commission of the regional organisation.

Regional organisations promote and support the implementation of common standards in the member states, e.g., common classifications, methodologies, and quality systems (see section C.9.6.3). Regional data series and indicators compiled by regional organisations are normally generated on the basis of data reported by their member states. Thus, the departments responsible for statistics in the regional organisations need effective communication of data from the NSOs of their member states, as well as access to international statistical databases.

STATAFRIC, the African Union Statistical Institute, is based in Tunis and provides support to all member states of the African Union, i.e., all countries on the continent. It has a central role in supporting the implementation of the provisions of the African Charter on Statistics and the Strategy for the Harmonization of Statistics in Africa 2017-2026 (SHaSA 2). It is at the centre of the promotion and production of harmonized official statistics in Africa and carries out a range of different activities to strengthen statistical capacity and the quality of statistics across Africa, both by itself and in cooperation with the EU and other donors. STATAFRIC itself is an outcome of SHaSA's objective 'To establish an effective coordination mechanism' of the strategic theme 'To coordinate the production of quality Statistics for Africa'.

The European Union has been supporting STATAFRIC from its inception through the Pan African Statistics Programmes (PAS I (2016-2021) and PAS II (2021-2025)). PASs have been providing technical support to STATAFRIC among others for the update of the Strategic Plan for 2019-2023 in view of the Agenda 2063, SHaSA 2, the 2030 Agenda and other key strategies and agendas, as well as for a proposed roadmap to establish an action plan, a staffing strategy and a work programme (see also section B.1.2.4).

For development partners providing support to statistics at regional level, capacity development is often a major concern, both at regional (for the statistical secretariats or units of the regional organisations) and at national level (for the national statistical systems of their member states). In general, communication and coordination are essential. A good practice to improve coordination and involve national stakeholders in the regional process is to identify or designate national focal points. This generally improves communication and feedback and strengthens the member states' sense of ownership and involvement in the regional process.

The regional organisations are also in a position to exploit economies of scale by working closely with their member states on common statistical needs. In particular, this concerns training of staff (see section C.9.7), building up IT infrastructure, databases and software (see section C.9.9) etc.

When the number of professionals in each member state needing specific training is small, it may be more efficient to organise such training sessions at regional level. This also has the added value of creating a forum for exchanging and discussing professional experiences and good practices across the member states. However, practical considerations and costs may be prohibitive. Alternatively, economies of scale may also be achieved through running the same

training courses in individual member states or by setting up e-learning courses.

Common statistical software also creates economies of scale in software development, introduction, maintenance and training. The use of common software enables the development of local expertise and makes training and support more efficient.

AFRISTAT is an example of a sub-regional body with an exclusively statistical purpose. Its statistical functions as a regional organisation are presented in Box C.9.5.

Box C.9.5: A sub-regional statistical body: AFRISTAT

AFRISTAT is a sub-regional organisation with an exclusively statistical purpose. Its goal is to support the development of statistics in its member states, with an emphasis on economic, social, and environmental statistics. AFRISTAT currently comprises 22 member states. Its headquarters are located in Bamako, Mali.

AFRISTAT responds to the need for regional economic integration through its support for comparable statistical information. It has statutory power in terms of harmonisation of concepts, standards, and statistical methods. Its member states define a work programme, which is implemented by operations to support collection, processing and dissemination of statistical information and its economic analysis.

Source: AFRISTAT (the Economic and Statistical Observatory of Sub-Saharan Africa)

C.9.6.3 RANGE OF REGIONAL STATISTIC PROJECTS

Improving regional organisations' use of statistics in their policy formulation, analysis and evaluation is one of the key motivations and aims of regional projects (see also section B.2.4.2). Generally, regional and international organisations do not involve themselves in the collection of data, but rather on ensuring that their member states work in a coordinated manner towards commonly agreed goals. The aim is to provide data for the organisation's member states that are as comparable as possible, in order to provide stakeholders at all levels with information for viable analyses of regional development, comparisons of individual countries and a consistent evidence base for policy decisions and monitoring. These stakeholders include decision makers at regional level as well as on national level, donors, international organisations, NGOs, analysts and researchers, media and the general public.

For regional organisations with a mission to strengthen regional economic integration, multilateral monitoring is essential to pursue the objectives of regional integration and convergence of the economic policies of the member states. In this context, the quality, comparability and timeliness of macro-economic statistics are of high importance. Furthermore, donor decisions on country resource allocation use macro-economic statistics as a key input (see section B.3.3.1); thus, the availability, reliability, comparability and timeliness of these macro-economic statistics are vital. This also applies to a number of social and environment statistics.

Regional organisations may also focus on other areas. For regional organisations of partner countries, a key area is progress towards the Sustainable Development Goals (SDGs), including social issues such as poverty and hunger, health and education, gender equality, as well as environmental sustainability. The need for specific disaggregations, e.g., by gender, age, rural versus urban regions etc., raises major challenges for many statistical systems.

The CCSA Task Team on Coordination at the Sub-regional level distinguished between two types of regional statistics projects: Projects that support regional integration and strengthen the statistical capacity of regional organisations and projects supporting NSSs through a regional approach.

The first group of projects often support several objectives: development and application of common classifications, methods and definitions for the member states of the regional organisation; promotion of common data collection programmes using harmonized methods; collection, compilation, dissemination and analysis of statistical data for the region. Typically, the key activities include one or more of the following:

- Strengthening coordination and management of regional statistics, including the regional legal framework;
- Developing and strengthening regional statistical infrastructure, including harmonisation of definitions and classifications and development of databases;
- Investment in appropriate infrastructure, especially information and communication technology (see section C.9.9);
- Support for regional data collection activities and for the compilation of harmonized regional statistics;
- Supporting data dissemination;
- Human resource development (see section C.9.7).

The second group of projects covers those aimed at improving the capacity of NSSs with support organised and delivered at regional level. Such projects and programmes are especially interesting if the countries in the region covered are small, they have a common background, a common language and/or face similar challenges regarding their statistical systems.

A considerable share of the European Commission's funding for statistical development is channelled through regional and sub-regional organisations and programmes such as the African Union through the Pan African Statistics Programme 2021-2025 (PAS II) and ASEAN through the ARISE Plus 2017-2022 programme (see section C.8.4.5 for more details).

Based on its review of regional programmes and operations of the World Bank in 1995-2005, the World Bank's Independent Evaluation Group (IEG) concluded that there seem to be five key determinants of success for any regional programme:

- Strong country commitment to regional cooperation;
- The scope of objectives has to match both national and regional capabilities;
- There needs to be clear delineation and coordination of the roles of national and regional agencies;

- Acceptable governance arrangements take time to be put in place, but are crucial;
- Planning to sustain the benefits once the programme comes to an end must be built in from the beginning.

In a more recent evaluation, 'Data for Development: An Evaluation of World Bank Support for Data and Statistical Capacity' (2017), the World Bank's IEG developed a list of features of successful national data systems of the future:

- Institutions based on: Open data laws; Rights to privacy; Accountability to users; Broad outreach to society; Harmonized data conventions.
- Organisations that have: Budgetary autonomy; Trained staff; Adequate installations; Connected databases; Early warning systems; International partnerships.
- Data that are: Up to date; Disaggregated; Easy to manipulate and visualize; Accessible in remote areas; Georeferenced; Contestable; From integrated data sets.
- Users who are: Connected; Data literate; Diverse (e.g., academics, civil society organizations, media, and local and central governments).
- Data uses: Planning; Policy making; Monitoring; Targeting; Research; Advocacy; Lobbying; Citizen empowerment.

Compilation of regionally comparable data involves procedures for data transfer from the member states to the regional level. These procedures should define the list and format of data to be transferred, the transfer mode and the transfer schedule. A lack of timely data in a member state (or even late transfer) disturbs the production process of regional statistics; dependent on the context, estimations may be used for the country concerned. However, in the longer term this is not a satisfactory solution. The issues preventing timely transfer of national data should be addressed together with the country concerned, in order to seek permanent solutions to assure the availability of national data. This issue highlights the importance of efficient coordination at regional level and of good communications with the focal points or coordinators at national level.

Box C.9.6: Example: The African Trade Statistics Yearbook and production of trade aggregates for the African Union and the Regional Economic Communities (RECs)

African Trade Statistics Yearbook was prepared by STATAFRIC, the African Union Institute for Statistics, using data provided by the AU Member states. The Trade Yearbook was produced with the support of the European Union through the Pan-African Statistics Programme 2016-2021 (PAS I). The Trade Yearbook is the result of close collaboration between STATAFRIC, statistics departments and divisions of the RECs and NSOs, customs authorities and other institutions responsible for trade statistics in the AU Member states.

Significant efforts were allocated to compile trade aggregates for each of the eight RECs and for the AU as a whole. The compilation of trade aggregates for the AU is a first step towards harmonisation of practices and methodologies for preparation of trade statistics across the AU Member states.

Compilation of trade statistics is a high priority for the AU and its Member states. With the adoption of the 'Agenda 2063: The Africa We Want' in 2013 and its first ten-year implementation plan, a number of aspirations, objectives and targets are related to trade. Thus, various trade policies need to be enacted.

In addition, in January 2012, the Assembly of Heads of State and Government of the AU adopted a decision to establish the African Continental Free Trade Area (AfCFTA). The main objectives of AfCFTA are to create a single continental market for goods and services, with free movement of business, persons, and investments, and thus pave the way for accelerating the establishment of a customs union. Due the COVID 19 pandemic, the operationalisation of AfCFTA was postponed to January 2021.

In this context, harmonised and high-quality trade data are very important to support trade negotiations. There is a need to get comprehensive, detailed and reliable statistics on merchandise trade in the AU. Moreover, detailed Intra-AU and Extra-AU trade statistics are needed to evaluate the effectiveness of the measures taken by African leaders to boost Intra-African trade, which have a high impact for the economic development of the continent.

Reliable foreign trade statistics for Africa must be available to all who need them. STATAFRIC is putting maximum effort to ensure availability of the needed statistics.

Source: African Union: African Trade Statistics Yearbook 2020 (2020)

In Africa, the African Union Commission, the African Development Bank, the United Nations Economic Commission for Africa (UNECA) and the African Capacity Building Foundation have cooperated to develop the 'Strategy for the Harmonization of Statistics in Africa 2017-2026' (SHaSA 2). SHaSA 2 highlights the priority statistical requirements for the AU's vision for the future of the continent, "Agenda 2063: The Africa We Want" and of the Agenda 2030 for Sustainable Development. It defines four Strategic themes:

- Strategic theme 1: Produce quality statistics for Africa;
- Strategic theme 2: Coordinate the production of quality statistics for Africa;
- Strategic theme 3: Develop sustainable institutional capacities of the African Statistical System (ASS)
- Strategic theme 4: Promote a culture of quality policy and decision-making

The African Union statistical institute STATAFRIC plays a central role in the implementation of SHaSA 2 and its strategic themes and objectives.

SHaSA 2 is supported by a ten-years Action Plan, a Financing Plan and Resource Mobilisation and Financing Strategies. The Action Plan constitutes a common statistical initiative of the ASS. The framework used to prepare it is the Results-Based Logical Framework Matrix (RBL-FM) derived from the strategic matrix of SHaSA 2 (see also section B.1.2.4).

Box C.9.7: Example: Practical issues in a region-wide statistical data collection – the UEMOA harmonised price index

Each UEMOA state produces a harmonised price index. It is based on a methodology common to all member states. In each member state, data are collected on a monthly basis and a monthly index is calculated using the same software (so-called CHAPO). The data are transferred to the UEMOA Commission every month and are used in the calculation of the UEMOA regional price index.

Occasionally, member states were unable to produce their index for several months due to a hard-disk failure in the computer that was hosting CHAPO. The consequence was that during this time, due to a very basic technical problem, the UEMOA Commission was unable to produce the UEMOA regional price index.

This example illustrates the importance to regional projects of proper routines and contingency plans at both regional and national level. Furthermore, it clearly shows the critical importance of proper ICT structures and equipment for transmission of data and administration of common software solutions (see also section C.9.9).

When harmonisation is deemed the most appropriate approach to improve comparability of member states' data, harmonisation objectives must be defined in a realistic way. Two approaches to harmonisation could be envisaged:

- Harmonisation of concepts, nomenclatures, and methodologies: International recommendations are adjusted to the specific requirements of the regional organisation's member states and to their situation regarding statistical capacity and the development of the statistical system.
- Harmonisation of tools: Common statistical and technical tools are defined and put in place. When processing tools in the regional organisation's member states are missing or of poor quality, the conditions for developing and/or implementing shared tools are favourable, leading to higher efficiency, stability, and comparability at lower costs.

Box C.9.8: Examples: Regional harmonisation of methodologies and tools – PARSTAT 1-2-3 surveys and COMESA statistical software support and training

Harmonisation of statistical methodologies:

In the framework of PARSTAT, the statistical part of the UEMOA Community programme to support regional integration (PARI), the same methodology for observing the informal sector (1-2-3 survey) was shared by the member states Benin, Burkina Faso, Ivory Coast, Mali, Niger, Senegal and Togo. The 1-2-3 survey was based on the principles of modular mixed mode (household/enterprise) surveys. The use of a harmonised methodology made it possible to analyse the size and the characteristics of the informal sector across the UEMOA and between its member states. The same methodology has since been applied in e.g., the Democratic Republic of Congo, Burundi and Vietnam.

Source: Union Économique et monétaire Ouest Africaine (UEMOA): L'emploi, le chômage et les conditions d'activité dans les principales agglomérations de sept États membres de l'UEMOA and Razafindrakoto, M., Roubaud, F. and Torelli, C.: 'La mesure de l'emploi et du secteur informels : leçons des enquêtes 1-2-3 en Afrique', African Statistical Journal, Volume 9 (2009)

Harmonisation of statistics processing tools:

The COMESA States have chosen the Eurotrace software suite, developed by Eurostat, to produce their external trade statistics. The choice of a common software solution has enabled the development of local expertise, and the COMESA Secretariat has continuously provided training and technical support to Eurotrace installations in its member states. Regional trainings have been organised on an annual basis, where participants from each member state have been invited to the COMESA secretariat for one- or two-week trainings, with the ultimate objective of sharing the acquired knowledge with their colleagues back in the NSO. However, the high turnover of staff in the NSOs and the redeployment of staff to other units lead to rapid loss of the acquired expertise. In response to this challenge, the COMESA Secretariat has developed an e-learning platform and e-learning course material for external trade.

Source: Eurotrace, Eurotrace User Community and COMESA's e-Learning portal

C.9.6.4 INSTITUTIONAL ISSUES

Coordination is crucial to regional projects. A strategy for coordination of the project should be defined from the outset. One should keep in mind that the actors are not only the official statisticians; governments must have awareness of the importance of quality statistics to evidence-based policy making. Governments are both key users of statistics and responsible for strategies and resource allocation, at national level as well as at regional level, through their role in the decision-making processes of the regional organisations.

Advocacy for statistics is thus an important action in the context of regional and national commitment to statistics, their harmonisation, and their inclusion in regional and national development strategies. The regional approach may strengthen the national advocacy efforts for statistics, by building pressure on governments to comply with at least the minimum of the requirements of the regional project.

Effective advocacy for statistics, both in terms of promoting evidence-based decision making as well as ensuring that statistical activities are properly financed and resourced, is crucial to the development of national statistical systems. PARIS21 has developed a range of statistical advocacy materials and an advocacy toolkit and maintains a library of regional and national advocacy (see section C.9.5).

A key question is who will coordinate the regional project. Several options are feasible; a regional organisation with a dedicated statistics function is often a natural coordinator. Alternatively, one of the NSOs or other national institutions involved may take on a coordinating role. Another solution would be to establish an ad-hoc coordination entity for the specific regional project.

Often, regional projects involve a number of different stakeholders at national level. It is a good practice to use national focal points/coordinators to coordinate the networks of national stakeholders and activities at national level, when possible.

User-orientation is a key aspect of statistical quality (see section C.6.3). However, the user group for regional statistics is wider than the user group outlined in Box B.2.29. Obviously, governments within the region are key users, both in their function as national decision makers and through their role in the decision-making processes of regional organisations. Commissions or Secretariats of regional or sub-regional organisations are other key users, requiring consistent regional data and comparable national data for multilateral monitoring of policies and national compliance, for evaluating the progress of regional integration etc. International organisations are also important users of national statistics and thus have a strong interest in the comparability of national statistics and their consistency with international principles, standards, and good practices. Donors and other technical and financial partners also require regional and national data.

C.9.6.5 PROJECT ISSUES

The scope of regional projects is linked to the mandate of the regional organisations, their capacity, and their ability to coordinate with their member states. Each regional organisation has its defined mandate and objectives; this will naturally also limit the domain and the scope of projects they can deal with.

There is no standard approach or rule that can be applied to all regional projects; regions are simply too different. The importance of efficient coordination and a well-designed strategy for the project must be underlined. However, there are some core principles to be considered:

- User relevance
- Efficiency of a regional versus a national approach
- Advocacy and commitment of regional and national decision-makers
- Integration in and consistency with general development strategies at regional and national level
- Coordination strategy
- Subsidiarity
- Capacity development
- Sustainability of results

Training and capacity building are crucial. Regional projects must have a realistic approach regarding the available IT environment and the expected investment in IT. The sustainability of the investment in IT infrastructure and associated human capital is critical for the long-term viability of the project, on regional and on national level.

Training is also a key part of statistical capacity building. A regional approach may often prove efficient for training on specific statistics-related issues. Regional organisations are well situated to coordinate and set up training programmes to meet the needs of its member states. If regional trainings are arranged centrally, a budget for travel costs must be included. Alternatively, the same training courses can be offered in individual member states, thus reducing the travel required to the instructors, or by setting up e-learning courses. Issues concerning training for official statistics are further described in section C.9.7.

To find out more…

about the regional dimensions of European Commission support to statistics

- Eurostat: International cooperation – Overview
- Eurostat: International cooperation
- Eurostat: International cooperation – Pan African Statistics Programme (PAS)
- Eurostat: Pan African Statistics Programme II, Eurostat presentation to the 9th meeting of the Forum on African Statistical Development (FASDev) 14.12.2020
- Eurostat: Statistical cooperation - European Neighbourhood Policy-South (ENP-S) and MEDSTAT programme (Statistics Explained articles)
- Eurostat: ENP-South statistical cooperation and MEDSTAT
- Commission Implementing Decision C(2020) 7372 final of 29.10.2020 on the annual action programme part II in favour of the European Neighbourhood Instrument (ENI) South countries for 2020 - Annex 2: Support to the statistical systems of the Neighbourhood South countries (MEDSTAT V)
- Delegation of the European Union to ASEAN: ASEAN, EU launch flagship programmes on policy dialogue and economic integration (press release; 2018)
- European Commission Communication COM(2008) 604: Regional integration for development in ACP countries
- Evaluation of the Commission Support for Statistics in Third Countries (2007)
- Eurostat statistical cooperation first point of contact: ESTAT-STATISTICAL-COOPERATION@ec.europa.eu

about statistics in a regional or sub-regional context

- African Charter on Statistics
- African Development Bank, African Union Commission and UN Economic Commission for Africa: Strategy for the Harmonization of Statistics in Africa (SHaSA) and Strategy for the Harmonization of Statistics in Africa 2017-2026 (SHaSA 2)
- UN Economic Commission for Africa: Statistical Commission for Africa
- African Union: Conference of African Ministers responsible for Civil Registration
- African Union: Pan-African Institute for Statistics (STATAFRIC)
- Pan African Statistics (PAS) programme: Peer reviews of NSIs/NSSs in African countries: proposed methodology (draft) (2016)
- Pan African Statistics (PAS) programme: Pan African Statistics programme - presentation leaflet
- ASEAN: ARISE Plus providing technical support for ASEAN economic integration and ARISE Plus Component 4: ASEAN Economic Integration Monitoring and Statistics
- ASEAN: ASEAN Regional Integration Support from the EU (ARISE Plus) presentation brochure
- World Bank Independent Evaluation Group (IEG): Data for Development: An Evaluation of World Bank Support for Data and Statistical Capacity (2017)

about Regional Strategies for the Development of Statistics (RSDS)

- PARIS21: Regional Strategies for the Development of Statistics (RSDS) - Overview and The RSDS Approach in a Nutshell (leaflet)
- Caribbean Community (CARICOM): Caribbean Community (CARICOM) Regional Strategy for the Development of Statistics (RSDS) 2019-2030 and CARICOM Regional Statistics
- Comunidad Andina (CAN): Estadística and Programa Estadístico Comunitario (PEC) 2018-2022
- Pacific Community, Statistics for Development Division: Strategic Framework for Pacific Statistics 2022-2030
- Southern African Development Community (SADC): The SADC Successor Regional Strategy for the Development of Statistics (2020-2030)

C.9.7. Statistical training

Human resources management and training are essential parts of statistical capacity development. Training in the context of strengthening the capacity of NSOs and NSSs to efficiently produce quality statistics in line with international standards and user needs were already described in section C.7.2.2.

The European Union has funded a number of projects for the initial training of statisticians (scholarships, study awards, funding, and other assistance to statistical training schools) as well as for vocational training.

These actions have been largely appreciated. The 'Evaluation of the Commission Support for Statistics in Third Countries' indicated that:

> *"Particular improvements could be observed in partners' capacity to collect and process data, in early warning indicators and regional trade data, in the conduct of surveys, and in a move towards adoption of internationally recommended practices."*

Training courses, covering face-to-face trainings, video seminars as well as e-Learning courses, are part of Eurostat's activities to support the statistical capacity development in partner regions and countries. They are important and integral parts of Eurostat regional cooperation programmes Pan-African Statistical Programme, MEDSTAT and ARISE Plus (see section B.1.2.4 and C.8.4.5). In addition, training courses are arranged and supported on a case-by-case basis on request from regional organisations or NSOs in partner regions. Eurostat's training offers focus on key issues of statistical capacity development and issues where Eurostat and the ESS have specific expertise and experience, in particular the statistical capacity tools developed by Eurostat and specific software tools for official statistics that have been developed with support from Eurostat.

Eurostat regularly organises, in collaboration with partner statistical institutions, seminars that bring together statisticians across a region. These seminars focus on a range of themes, such as topics relating to the assessment of statistical systems, statistical governance or quality issues.

In addition, Eurostat hosts each November an 'International Study Visit' (ISV) at its premises in Luxembourg. It is a week -long event aimed at the staff of NSOs from non-EU countries. The topics covered include governance, legislative framework, how Eurostat staffs, plans and finances its activities, how the different actors (Eurostat, EU Member States etc.) work together. There are also presentations relating to Eurostat and the ESS practice within individual statistical domains. The speakers are all Eurostat staff.

Most of the initial training activities have been developed at the sub-regional level and have succeeded in creating regional networks of statisticians who often keep in touch after their initial education. This is a very important long-term effect in that it enables South-South and peer-to-peer learning and creates support networks for key statistical tools that reinforces national and regional ownership of know-how and practical experiences.

Many UN organisations and other international organisations, such as UNSD, UNDP, UNPE, ILO, FAO, WHO, World Bank, IMF, PARIS 21, Regional Development Banks and UN regional commissions, have developed training courses aimed at statistical capacity building in partner countries and regions. In addition to traditional face-to-face training courses, the proliferation of more stable internet connections and higher bandwidths coupled with technical progress have seen a rapid growth in web seminars, e-learning solutions and mixed-mode solutions also in the field of statistical training and capacity development. The COVID-19 pandemic has strongly accelerated this process.

Vocational training is particularly necessary in **new information and communication technologies (ICT)**, with an emphasis on their application in analysis and dissemination, as well as **new and non-traditional data sources** within the so-called **'Data Revolution'** and **new models for modernising official statistical organisations, systems and processes** (see section C.6.3.3). But vocational training is also justified to help statisticians to adapt to the national and global development agendas. Statisticians educated a decade ago have probably not been trained in the production of environment or governance statistics or in the analysis of gender issues.

Experience has shown that such **training is often more efficient at sub-regional level**. However, there are also limits to the possibilities for arranging training at regional level, such as different language skills or too different competence levels between the countries.

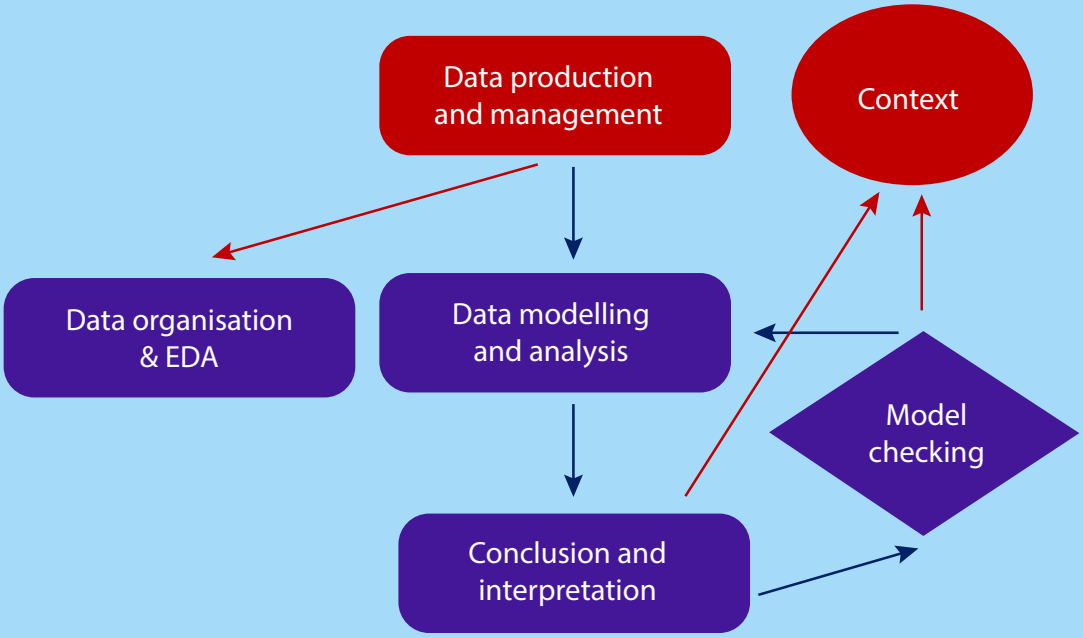
A number of Statistical Training Centres have been set up in Africa. In addition, many statisticians have been trained outside the region. However, Africa still lacks statisticians and related professionals, in particular with up-to-date knowledge of new statistical subjects, methodologies and tools. In response, more and more African countries have created national training centres within their NSO or co-operate with national universities to further the education of statisticians.

The adoption of the African Charter on Statistics and the Strategy for the Harmonization of Statistics in Africa (SHaSA) have given strong impetus to cooperation between regional organisations, RECs, NSOs and others in strengthening the statistical capacity in Africa. The Strategy for the Harmonization of Statistics in Africa 2017-2026 (SHaSA 2) has formed the basis and provided the vision for establishing the African Union Statistical Institute, STATAFRIC, and the Pan-African Statistical Training Centre (PANSTAT), based in Yamoussoukro, Ivory Coast. The European Union is supporting the development and activities of these key African statistical institutions through the Pan African Statistics Programme 2021-2025 (PAS II).

STATAFRIC is cooperating with international partners to arrange virtual trainings and workshops on strategic planning for data and statistical development. PANSTAT has in its mission to coordinate and harmonize training in statistics and demography in Africa and support capacity building, training and research in statistics and demography. It also acts as an accrediting body for Schools of Statistical Training in Africa.

Box C.9.9: The gap between university education and skills used in NSOs

Most of the work of the NSOs is concerned with the red area (Data production and management) of the diagram below, while universities focus mainly on the blue area (Data organization and exploratory data analysis; Data modelling and analysis; Conclusions and interpretation; Model checking). The participants of a South-African Development Community (SADC) 'training of trainers' workshop were asked to estimate the proportion of time spent in the red and blue areas. Participants from NSOs said that they spent over 95% of their time in the red area, while universities said they spend 100% of their time in the blue area. Participants saw this distinction as the reason why most university graduates need further training before they are efficient in jobs in the NSSs.



The issue is how to close the gap or how to provide sustainable alternative or complementary training. Solutions may be different between regions and linguistic areas, on the basis of different educational and administrative structures.

Source: SADC Secretariat, European Development Fund and Eurostat

To find out more…

- Eurostat: International statistical cooperation – Sharing values and practice
- Global Network of Institutions for Statistical Training (GIST): Courses Inventory
- African Union: Strategy for the Harmonization of Statistics in Africa 2017-2026 (SHaSA 2); STATAFRIC, the Pan-African Institute for Statistics and PANSTAT, the Pan-African Statistical Training Centre
- United Nations Economic Commission for Europe (UNECE): Human Resources Management and Training – Compilation of Good Practices in Statistical Offices (2013)
- PARIS21: PARIS21 Academy
- Asian Development Bank/Development Asia: Designing Online Courses for Statistical Capacity Building
- Dag Roll-Hansen: In-house training in statistical organisations – Some issues to consider and suggestions for courses, Statistics Norway Documents 31/2012 (2012)
- Centre d'Appui aux Écoles de Statistique Africaines (CAPESA)
- Food and Agriculture Organization of the United Nations (FAO): Capacity development – How to assess learning needs
- World Health Organization (WHO): Evaluating training in WHO (2010)
- United Nations Economic Commission for Europe (UNECE): Making Data Meaningful - Part 4: A guide to improving statistical literacy (2014)
- African Group on Statistical Training and Human Resources (AGROST): Statistical Training Programme for Africa (STPA)
- UNECA – African Centre for Statistics (for AGROST): Trends of statistical training and human resources development in Africa; Statistical training needs and capacity assessment; Compendium of African Statistical Training Centres (in French); Review of the statistical training curricula in Africa (in French); Harmonization and standardization of statistical curricula and qualifications (2011)
- United Nations Economic Commission for Africa: Global Strategy for Improving Statistics for Food Security, Sustainable Agriculture, and Rural Development: Action Plan for Africa 2011-2015 – Training Component (2012)

C.9.8. Other support

Training remains a core aspect of statistical capacity development (see sections C.7.2.2 and C.9.7). However, at each step of the statistical process, support can take a number of other forms, depending on the needs of the partner country or region:

Developing statistical infrastructure:

- Implementing modern frameworks and models for operation of national statistical systems, such as the Generic Statistical Business Process Model (GSBPM), the Generic Activity Model for Statistical Organisations (GAMSO), the Generic Statistical Information Model (GSIM), the Common Statistical Production Architecture (CSPA) and the Common Statistical Data Architecture (CSDA) (see section C.6.3.3);
- Implementing relevant recommendations of the UN Statistics Division's Handbook on Management and Organization of Statistical Systems (see section B.1.3.3);
- Providing Geographical Information System (GIS) software to help in the design of a census or of a sample for another survey;
- Providing ICT hardware and software, for instance for building and maintaining business registers, person registers, administrative registers etc., for contacts with data providers and contacts with data users and for use as sampling frames;
- Methodological and general documentation of all core activities, processes and tools;
- Ease the access to internet;
- When internet access is limited or unstable, making sufficient paper copies of relevant international classifications, standards and methodologies available to the data producers concerned;
- Spread information on cost-effective methodologies and good practices that have been developed in other countries.

Data collection:

- Standard questionnaires: for household surveys, the International Household Survey Network (IHSN) offers useful information, including a Question Bank which provide a repository of international questionnaires, interviewer instructions, classifications, concepts, and indicators; IHSN with actual country questionnaires; advice on the key principles of questionnaire design (see section B.1.2.1);
- The Accelerated Data Programme (ADP) helps countries improve their survey programmes and increase the use and value of survey data. ADP provides technical and financial support to survey data documentation and dissemination, and to the improvement of survey methods (see section B.1.2.1);
- The World Population and Housing Census Programme maintains a key knowledge base and resource centre for countries that are planning a population and housing census, one of the key sources to detailed and disaggregated data required, e.g., for the SDGs indicators (see section B.1.2.1).

Data processing:

- Modern statistical software, which is more and more efficient. Key examples of tools that strengthen statistical capacity in partner countries are Eurotrace (statistics on international trade) and ERETES (national accounts). Eurostat was central in the development of Eurotrace and ERETES, and actively supports implementation, training and developing practitioner networks (see section C.9.9);
- Implementation of the SDMX standard for transfer of statistical data. Eurostat actively supported the development of SDMX together with a network of key international organisations, and SDMX is extensively used within the ESS. Eurostat has set up an SDMX info space on its website, and actively promotes the take-up and implementation of SDMX in partner countries and regional organisations, including sharing of own experiences and good practices and training offers (see section C.9.9);
- Development of standard tools for processing surveys, automation of the production process for short-term indicators;
- Archiving tools. For example, the establishment of national survey databanks is one of the key outputs of the Accelerated Data Programme's work with partner countries.

Analysis:

- Modern statistical software offers more and more powerful analytical tools (see section C.9.9);
- Examples of similar analysis made in other countries.

Dissemination:

- A GIS software is needed to present data broken down by district. This may attract new users, for example decision makers at local levels, and new uses such as detailed analysis of how poverty, health supply and supply of education is distributed between local districts;
- Providing standard tools for dissemination of databases to the general public;
- Tools for visualisation of data, e.g., for online dissemination through websites and social media platforms;
- Tools to design websites.

From the list above, it is obvious that the supply of **new ICT tools**, both on the hardware side and the software side, play a major role. Of course, the supply of such tools must come together with the training needed to use them properly.

To find out more…

- High-Level Group for the Modernisation of Official Statistics (HLG-MOS): working areas Human resources, organisational frameworks and evaluation; Statistical production, methods and information technology; Data collection and data sources; Dissemination and communication and Standards and metadata.
- Generic Statistical Business Process Model (GSBPM)
- Generic Activity Model for Statistical Organisations (GAMSO)
- Generic Statistical Information Model (GSIM)
- Common Statistical Production Architecture (CSPA)
- Common Statistical Data Architecture (CSDA)
- Data Documentation Initiative (DDI)
- United Nations Statistics Division: Handbook on Management and Organization of National Statistical Systems
- International Household Survey Network (IHSN)
- Accelerated Data Programme
- UN Statistics Division: Household Sample Surveys in Developing and Transition Countries (2005)
- UN Statistics Division: World Programme on Population and Housing Censuses
- UN Statistics Division: The Census KnowledgeBase
- United Nations Population Fund (UNFPA) – Census
- PARIS21: Data visualization toolkit
- PARIS21: Guidelines for developing statistical capacity – A roadmap for capacity development 4.0 (2020)

C.9.9. Support for IT in statistical capacity development

The existence and the proper management of an appropriate ICT system are essential to produce modern statistics and a key component of sustainable statistical capacity. This applies not only to the NSOs and their regional offices, but also to all other statistics-producing agencies within the NSS. The NSS in many partner countries faces problems caused by a lack of modern computer and networking equipment, suited to the tasks at hand, sometimes coupled with unstable internet connections and power supply. ICT is important in the whole statistical process: from registers (sampling frames), via sampling, data collection and processing, data storage, data transfer, to analysis and dissemination.

In response to these challenges, ICT has a natural, integrated role in several development cooperation programmes addressing statistical capacity and statistical systems. However, NSOs and other producers of official statistics often encounter specific challenges that require software solutions specifically designed to overcome such issues. Common regional statistics actions have often been based around development and implementation of common statistical tools.

Eurostat has been central in the development of several very useful tools for NSOs, statistical departments in national organisations and regional organisations, supporting development, implementation as well as training in them. Eurotrace is an application for collection, compilation, and dissemination of international trade data at national and regional level. It is a generic and open system able to be adapted to national and regional requirements and to most types of statistics. It is used by customs administrations and NSOs in countries across the world. Eurotrace has an active user community with exchange of experiences and advice. The 'Common Market for Eastern and Southern Africa' (COMESA) has developed e-Learning courses on Eurotrace (see Box C.9.8). Eurostat continues to support training in Eurotrace, through its regional projects like the Pan-African Statistical Programme 2021-2025 (PAS II), MEDSTAT 2021-2026 (MEDSTAT V) and ARISE Plus 2017-2022 (see section C.7.4.5), in addition to training arranged in other regions.

In addition, Eurostat been developing together with INSEE, the French national statistical institute, ERETES, a specialised software solution in the important domain of national accounts. ERETES is an application used for the elaboration of national accounts according to the SNA 2008. It is used in around 30 countries all over the world. Main programmes concerning the implementation are carried out in Africa and in Latin America and are funded by different partners. Through the Pan-African Statistics Programmes, Eurostat supported the training of trainers on national action plans for implementation of ERETES and the SNA 2008, organised by the AU and UNECA for the African RECs. Eurostat also provides support to ERETES training within other programmes and to other countries.

SDMX is an initiative to develop and implement standards for the exchange of statistical information. It is sponsored by Eurostat together with the Bank for International Settlements (BIS), the European Central Bank (ECB), the International Monetary Fund (IMF), the Organisation for Economic Cooperation and Development (OECD), the UN and the World Bank. Eurostat has supported several trainings in SDMX for partner countries.

In addition to these statistical tools, Eurostat has also supported the development of some more specialised tools. One of these is JDemetra+, a tool for seasonal adjustment developed by the National Banks of Belgium and Germany in cooperation with Eurostat. JDemetra+ is recommended to the members of the ESS and the European System of Central Banks for seasonal and calendar adjustment of official statistics. JDemetra+ implements the concepts and algorithms used in TRAMO/SEATS and X-12ARIMA. Besides seasonal adjustment, JDemetra+ includes other time series models, including outlier detection, nowcasting, temporal disaggregation and benchmarking. JDemetra+ is a collection of reusable and extensible Java components, easily accessible through a graphical interface. The software is free, open-source and developed under the EUPL licence.

Through the EU Framework Programmes for Research and with support from Eurostat, European national statistical institutes and universities have developed the τARGUS and μ-ARGUS tools for statistical disclosure control for tabular data and microdata respectively, addressing issues specific to official statistics. Both τARGUS and μ-ARGUS are open-source software, with an active user community in national statistical institutes and other organisations.

R is a programming language and free software for statistical computing and analysis. It is widely used by statisticians for programming statistical processes and procedures and for data analysis. It is used in many NSOs. Due to this widespread use, there are numerous scripts and procedures developed for official statistics in the relevant libraries, free to be adapted and reused. Eurostat offers training in the use of R in official statistics as part of its European Statistical Training Programme (ESTP). There are also frequent workshops and trainings in R arranged through summer schools, seminars and statistical conferences. The official R software is freely available under the GNU General Public License.

The 'Advanced Data Planning Tool' (ADAPT) has been developed by PARIS21 to help NSOs and other data producers to plan effectively for data required by policymakers and to monitor the progress continuously. ADAPT is a free, cloud-hosted tool. It promotes reuse of data and quality assessment of data sources. Additionally, it reinforces a coordinated data infrastructure in a national or regional context. ADAPT enables detailed data demand and supply analysis. The tool supports monitoring of data plan activities, including costing and budgeting.

Other international organisations also support development and implementation of software solutions relevant to official statistics. The World Bank's Data Group has developed the free software 'Survey Solutions', which assists governments, statistical offices, and NGOs in conducting complex surveys with dynamic structures using tablet devices. It can be used for Computer-Assisted Personal/Web/Telephone Interviews (CAPI/CAWI/CATI) as well as mixed mode surveys.

The U.S. Census Bureau has developed the Census and Survey Processing System (CSPro). CSPro is a public domain software package for entering, editing, tabulating, and disseminating census and survey data. CSPro is designed to be as user-friendly as possible. It can be used by a wide range of people, from non-technical assistants to senior demographers and programmers. CSPro supports data collection on Android devices (smartphones and tablets), and the Android data entry app works in collaboration with the desktop version of CSPro.

If statistical software is designed to be multilingual and to handle different local settings from the start, it is much easier to share. The UNECE Secretariat and the Conference of European Statisticians Sharing Advisory Board published 'Principles and Guidelines on Building Multilingual Applications for Official Statistics' (2012) with practical guidelines for software developers to facilitate international collaboration.

The hardware requirements of an NSO and/or the NSS must be carefully reviewed in cooperation with the beneficiaries, to assure that the equipment is appropriate both to the tasks and to the national situation. A realistic assessment of the needs and of the material capacity of the partner, as well as their absorption capacity, is crucial. Large-scale investments in IT normally involve a certain time lag from order to actual installation. It might also take time to adapt new software to the specific environment in the NSO. Scheduling should take this into account. In particular, training activities should be scheduled so that one can be certain that the equipment and software are in place.

Increasingly, classical paper interviews are supplemented by new tools such as web-based questionnaires and portable devices such as smartphones, tablet PCs etc. Using portable tools and CAPI/CAWI/CATI increases the efficiency of interviewers while yielding better quality data more rapidly. However, costs are still relatively high: one needs a smartphone, tablet PC or similar for each interviewer, and programming and training costs can be considerable. There are also practical issues to consider, such as the robustness of the devices and the possibilities to recharge them while in the field. The suitability of the software and the questionnaire is also crucial. Thus, the pros and cons of electronic survey solutions must be carefully considered. A number of examples are given in the 'To find out more' box below.

Physical and electronic security is crucial for confidentiality (i.e., that no identifiable individual data are available for non-statistical purposes), therefore for NSO integrity. Physical protection, well-functioning firewall technology and encryption routines are important.

Data access through the web and controlled-access institutional portals are helping NSOs and development organizations to reach out to users. Open data portals increasingly make data available to the general public, thereby improving transparency of official data and promoting increased and innovative use of the data.

The African Development Bank launched an Open Data Platform for Africa at the end of 2011, with the aim of facilitating and strengthening user access to quality data in African countries. This has now turned into the African Information Highway (AIH). A steadily increasing number of partner countries have adopted the Open Government Partnership; open data portals are being established in more and more partner countries.

To find out more…

about software for official statistics

- Eurotrace software for external trade of goods statistics; Eurotrace User Community and COMESA's e-Learning portal
- ERETES software for national accounts; ERETES on Eurostat's website
- Statistical Data and Metadata eXchange (SDMX); SDMX on Eurostat's website
- JDemetra+ tool for seasonal adjustment
- τARGUS and μ-ARGUS software for statistical disclosure control
- R free software for statistical computing and graphics
- Advanced Data Planning Tool (ADAPT), developed by PARIS21
- Survey Solutions software for Computer-Assisted Interviews (CAPI/CAWI/CATI) and mixed mode surveys, developed by the World Bank's Data Group
- Census and Survey Processing System (CSPro) software, developed by the U.S. Census Bureau
- KoBo toolbox, a free open source software suite with tools for field data collection in challenging environments
- Data4SDGs Toolbox, a set of tools, methods and resources developed by Global Partnership for Sustainable Development Data to help countries to create and implement data roadmaps for sustainable development

about Open Data for measuring development

- World Bank: Open Data on global development
- data.europa.eu: The Open Sustainable Development Goals Data Hub
- Global Partnership for Sustainable Development Data: Open Data for Sustainable Development, part of the Data4SDGs Toolbox (website)
- African Development Bank: Africa Information Highway (AIH), a network of live open data platforms (ODPs) electronically linking all African
- countries and 16 regional organizations; The AIH's data portal Open Data for Africa
- openAFRICA, non-governmental independent repository of open data on Africa
- Open Government Partnership (OGP)

about use of new technological data collection tools

- UNECE and the Conference of European Statisticians Sharing Advisory Board: Principles and Guidelines on Building Multilingual
- Applications for Official Statistics (2012)
- UNDP and UN Global Pulse: A Guide to Data Innovation for Development: From Idea to Proof of Concept (2016)
- UN Economic Commission for Africa and Global Partnership for Sustainable Development Data: Data for a Resilient Africa (2021)
- Petrov, O., Gurin, J. and Manley, L.: Open Data for Sustainable Development, Connections 2016-5. World Bank, Washington, DC. (2016)
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SUSTAINABLE DEVELOPMENT GOALS AND INDICATORS

D.10 SDGs and sustainable development indicators

D.10. SDGs and sustainable development indicators

The chapter in brief

This chapter starts by setting out the global framework for sustainable development, the European Union's development policies, and the role that statistical indicators play for measuring progress towards the Sustainable Development Goals (SDG).

The second section describes the background concepts and definitions supporting the tools for measuring progress.

The third section focuses on the sources of data and associated metadata required for quantifying global and national achievements in time and space. The roles and responsibilities of national and international stakeholders for monitoring progress and reporting on SDGs are depicted. The European Union development strategy as well as best practices from around the world illustrate the variety of paths adopted for measuring progress.

The fourth section provides a brief review of data quality assurance that secures trust in the reliability of statistical indicators. The fifth and last section presents the principles and methods recommended for constructing Sustainable Development Indicators that should lead to harmonised and comparable metrics.

D.10.1. Sustainable development framework

D.10.1.1 WHAT IS SUSTAINABLE DEVELOPMENT?

Sustainable Development is the organizing principle for meeting human development goals while simultaneously sustaining the ability of natural systems to provide the natural resources and ecosystem services on which the economy and society depend. The desired result is a state of society where living conditions and resources are used to continue to meet human needs without undermining the integrity and stability of the natural system.

The most well-known definition comes from the Brundtland report "Our common future" of the UN World Commission on Environment and Development (1987):

> *"Sustainable development is a normative concept, rather like 'justice' or 'democracy'. It integrates short-term and longer-term objectives and actions at local and global level, and seeks a balance between social, economic and environmental issues. The general meaning of the concept 'sustainable development' is clear, but there is no simple definition of it".*
>
> *"... development which meets the needs of the present without compromising the ability of future generations to meet their own needs".*

"Our common future" outlined seven critical objectives for environment and development policies that follow from the concept of sustainable development:

1. Reviving growth to eliminate poverty.
2. Changing the quality of growth to make it less material- and energy-intensive.
3. Meeting essential human needs.
4. Ensuring a sustainable level of population size.
5. Conserving and enhancing the resource base.
6. Reorienting technology and managing risk.
7. Merging environment and economics in decision making.

These seven strategic imperatives were followed up by a global political commitment in the "Rio Declaration on Environment and Development" and the "Agenda 21" action plan at the 1992 United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro in Brazil, also known as the "Earth Summit".

In September 2000, the Millennium Summit gathered the largest number of world leaders in history at the United Nations headquarters in New York City. At this meeting, world leaders ratified the United Nations Millennium Declaration and the 8 Millennium Development Goals (MDGs). The MDGs started a global effort to tackle the indignity of poverty. They established measurable, universally agreed objectives for tackling extreme poverty and hunger, preventing deadly diseases, and expanding primary education to all children, among other development priorities.

In June 2012, the UN Conference on Sustainable Development, also known as "Rio+20", was held in Rio de Janeiro. The conference addressed the global challenges of sustainable development (social, economic, environmental). In particular, it focused on two interlinked issues: the green economy in the context of sustainable development and poverty eradication, and the institutional framework for sustainable development. It resulted in a focused political outcome document which contained clear and practical measures for implementing sustainable development. In Rio, Member States decided to launch a process to develop a set of Sustainable Development Goals (SDGs), which would build upon the MDGs and converge with the post-2015 development agenda. The main objective was to produce a set of universal goals that meet the urgent environmental, political, and economic challenges facing our world.

In July 2014, the UN General Assembly's Open Working Group on Sustainable Development Goals (OWG) presented a proposal for new development goals to be achieved by 2030. The proposal contained 17 main development goals, sub-divided into 169 concrete targets. The 17 SDGs were formally adopted at the UN Sustainable Development Summit of 25–27 September 2015 in New York, under the title "Transforming our world: the 2030 Agenda for Sustainable Development" (see Box D.10.1). The SDGs balance the three dimensions of sustainable development: economic, social, and environmental. They are global in nature and universally applicable. However, each government can set its own national priorities in the context of this framework.

To monitor the progress towards these goals and their targets, the United Nations Statistical Commission created an Inter-agency and Expert Group on SDG Indicators (IAEG-SDGs) in March 2015. Their proposal for a global monitoring framework for the SDG, comprising 231 unique indicators, was agreed by the UN Statistical Committee in March 2016.

To facilitate monitoring progress, a variety of tools help tracking and visualizing achievements towards the SDGs. All intend to make data more available and more easily understood. For example, the online publication SDG-Tracker, launched in June 2018, presents available data across all countries and indicators.

Box D.10.1: Sustainable Development Goals

Goal 1 End poverty in all its forms everywhere.

Goal 2 End hunger, achieve food security and improved nutrition, and promote sustainable agriculture.

Goal 3 Ensure healthy lives and promote well-being for all at all ages.

Goal 4 Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.

Goal 5 Achieve gender equality and empower all women and girls.

Goal 6 Ensure availability and sustainable management of water and sanitation for all.

Goal 7 Ensure access to affordable, reliable, sustainable and modern energy for all.

Goal 8 Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.

Goal 9 Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.

Goal 10 Reduce inequality within and among countries.

Goal 11 Make cities and human settlements inclusive, safe, resilient and sustainable.

Goal 12 Ensure sustainable consumption and production patterns.

Goal 13 Take urgent action to combat climate change and its impacts.

Goal 14 Conserve and sustainably use the oceans, seas and marine resources for sustainable development.

Goal 15 Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation.

Goal 16 Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels.

Goal 17 Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development.

D.10.1.2 EUROPEAN UNION SUSTAINABLE DEVELOPMENT POLICIES

Following the UN Conference on Environment and Development in Rio de Janeiro (1992), the EU ratified both the Rio Declaration and Agenda 21. In 1997 sustainable development became a fundamental objective of the EU when it was included in the Treaty of Amsterdam as an overarching objective of EU policies. At the Gothenburg Summit in 2001, EU leaders launched the first EU Sustainable Development Strategy (EU SDS). In June 2006 a renewed EU Sustainable Development Strategy was adopted by the European Council.

In the run-up to the adoption of the 2030 Agenda, the Commission worked closely with the Member States to ensure an ambitious global outcome. The EU has fully committed itself to delivering on the 2030 Agenda and its implementation, as outlined in the European Commission Communication "Next steps for a sustainable European future - European action for sustainability" (2016), the reflection paper "Towards a Sustainable Europe by 2030" (2019) and "European Green Deal". The SDGs are an intrinsic part of the President's political programme[1] and lie at the heart of the policymaking on internal and external action across all sectors.

Eurostat supports this approach through regular monitoring and reporting on progress towards the SDGs in an EU context.

D.10.1.3 THE ROLE OF INDICATORS

Sustainable development indicators (SDIs) are conceived to enable assessment of whether targets and objectives of sustainable development are being met. In other words, they are policy performance indicators, designed to enable evaluation of the policy performance of the different facets of sustainable development.

By establishing quantitative measures for sustainability, it becomes possible to set goals, apply management strategies, and measure progress. Such indicators are needed to increase focus on sustainable development and assist decision-makers to adopt sound national sustainable development policies.

The SDG monitoring framework comprises several levels:

- **Global indicators**, which form the core of all other sets of indicators.
- **Indicators at regional**, national, and sub-national levels, developed by the UN member states to complement the global indicators, taking into account specific circumstances.
- **Thematic indicators**, developed in a number of areas.

Data are produced by the national statistical systems, ensuring national ownership. Countries are asked to strengthen collection of baseline data to better measure progress for each of the SDGs. Thus, statistical capacity building is essential for national statistical systems to meet the demands of the 2030 Agenda.

Following one of the main recommendations contained in the report entitled "A World That Counts", presented in November 2014 by the United Nations Secretary-General's IEAG on Data Revolution for Sustainable Development, the Statistical Commission agreed that a UN World Data Forum on Sustainable Development Data (UN World Data Forum) would be the suitable platform for intensifying cooperation with various professional groups, such as information technology, geospatial information managers, data scientists, and users, as well as civil society stakeholders. The first World Data Forum met in Cape Town in January 2017. Three more meetings have been held so far, in October 2020, October 2021 and April 2023.

Generally, the UN recommends a policy-driven approach, adapted to each region of the world. Thus, the regional Commissions of the UN are also prioritising the work on regionally adapted frameworks for SDIs. Good examples are the frameworks developed by the Economic Commission for Latin America and the Caribbean (ECLAC), the UN Economic Commission for Europe (UNECE), the UN Economic and Social Commission for Asia and the Pacific (ESCAP), the UN Economic Commission for Africa (UNECA), and the Organisation of Economic Cooperation and Development (OECD). The World Bank has developed dashboards to present data from the World Development Indicators (WDI) that help to monitor the SDGs, but these dashboards are not always the official indicators for SDG monitoring.

Eurostat and the European Statistical System play a leading role in providing data and monitoring to what extent the EU is on track to achieving the SDGs (see section D.10.3.3).

D.10.1.4 INDICATOR FRAMEWORKS

An indicator is a quantitative or qualitative factor or variable that provides a simple and reliable means to measure achievement, to reflect the changes connected to an intervention, or to help assess the performance of a development actor. Indicators need comparable, reliable, and timely data. Official statistics are a key source of such data. The accuracy and relevance of indicators are critically dependent on the timely availability and the quality of the data on which they are based. Official statistics are provided by the national statistical system (NSS); the statistical capacity of the NSS is essential to assure that the data needed for the indicators are available and of sufficient quality.

The European Commission uses the OECD Development Assistance Committee's typology to classify indicators. This classifies each indicator according to what it measures; an "input", an "output", an "outcome" or an "impact". Each indicator falls into one and only one of these types.

1 President Ursula von der Leyen's Political Guidelines: A Union that strives for more- My agenda for Europe.

Box D.10.2: Indicator types	
Type of Indicator	**What does it measure?**
Input indicators	Financial, administrative and regulatory resources ("process") provided by government and donors. It is necessary to establish a link between resources used and results achieved to assess the efficiency of actions. Examples: share of the budget devoted to education expenditure; technical assistance person-days provided.
Output indicators	Immediate and concrete consequences of the measures taken, and resources used. Examples: number of schools and training centres built, renovated, or equipped; number and percent of teachers trained; teachers employed; nurses trained, terrestrial or marine protected areas.
Outcome indicators	Results at the level of beneficiaries. Examples: gross enrolment rates in primary school; percentage of girls among the children entering first year of primary school; vaccinations; inscription rates for professional training; percentage of professional training graduates employed after training.
Impact indicators	Consequences of the outcomes. They measure the general objectives in terms of national development and poverty reduction. Examples: literacy rates; health improvement; employment and unemployment rates.

Indicators should be both limited in number and sufficiently comprehensive to capture the multidimensional nature of sustainable development. If too many indicators are used, the results become unwieldly and difficult to interpret. Indicators need to be clear and unambiguous. Clarity of purpose and audience will instruct indicator clarity.

Over the past period, the increased emphasis on evidence-based decision making has led to improved efforts to build capacity in this regard especially in partner countries. Despite major advances, data availability and reliability continue to be a problem in many countries. To increase cost effectiveness, SDG indicators often require data that are routinely collected either by national statistical services or through international processes. Many indicators rely on data contained in national accounts, and progress made in the adoption of the system of national accounts (SNA) will also improve data availability. For a detailed discussion of national accounts please refer to chapter F.17.

Countries are encouraged to strengthen their NSS for producing quality data necessary for providing indicators to respond to national and international needs. Moreover, to provide a framework for enhanced statistical systems, the International Monetary Fund in its "Enhanced General Data Dissemination System" (e-GDDS) sets out objectives for data production and dissemination. These objectives relate to four data properties ("dimensions"):

- Data coverage, periodicity and timeliness relate to the production and dissemination of economic, financial, and socio-demographic data by member countries.
- Quality of the data relates to information that is available to users to access the data covered by the system.
- Integrity of the data relates to the transparency of practices and procedures surrounding the production and dissemination of official statistics.
- Access by the public relates to the dissemination of official statistics to users in a convenient and equitable manner.

Data availability is a critical issue. In general, data required for SDG indicators are available at the national level from a variety of institutions that collect and manage the data, but there may be some gaps. National statistical offices are the major data source in most countries. In general, this holds for national and satellite account data, census data as well as data derived from major surveys. Other ministries and government agencies are also major data sources, especially for data from administrative records. Regional and international organizations also collect and manage data from various national sources and could be consulted directly in cases where the data are not readily available at the national level.

Good, reliable statistics are essential for measuring progress in reaching development goals and provide essential information about the effectiveness of policies and programmes. They help governments improve their policies

and to be transparent and accountable about the delivery of development results. Reliable statistics are a key element towards better measurement, monitoring and management of the results of development assistance.

A wide range of statistical data is needed to support the development process, to provide the evidence base for policy formulation, to support implementation, to monitor progress and to evaluate outcomes, inter alia:

- Social data;
- Economic data;
- Demographic data; and
- Environmental data.

The quality and availability of these data depend on the capacity of institutions involved in the NSS to answer to statistics users' needs, the legal and institutional framework, and the awareness of the importance of statistics at the political level.

The existence and use of indicators support the development of country-specific and country-owned policies and institutions. Indicators built on quality statistics are vital for the development of evidence-based policies. Furthermore, the development aid allocated to a country is calculated on the basis of a number of indicators. Multi-annual indicative allocations should be based on standard, objective and transparent need and performance criteria. Reliable and relevant indicators are vital for setting baselines, for monitoring and for evaluation of results, thus they should be comparable over space and time.

D.10.2. Concepts and definitions

Sustainable development covers two different scales: the temporal and the spatial. The temporal scale considers sustainability within a generation and between generations; the spatial scale considers sustainability with respect to local, national, regional and global sustainability. This is also at the core of the Agenda 21 action plan. With respect to the intra-generation scale and the spatial scale, there is a divide in economic, social and ecological standards and growth between partner countries and developed countries, often labelled a "North-South divide".

Another dimension of sustainable development is the discussion of "weak" versus "strong" sustainability as regards "natural" and "artificial" capital, understood as the volume and quality of the stock of natural, physical, human, financial, produced and social capital. In essence, these two views disagree as to what should be handed over to future generations. "Weak sustainability" argues that "natural" and "artificial" capital can be substituted for another, i.e., that depreciation of natural capital such as the use of non-renewable resources like oil and uranium can be compensated for by a corresponding investment in "artificial" capital such as knowledge of production of renewable energy and of energy efficiency. Strong sustainability, in contrast, argues that humans are embedded in a natural system and that limits to natural resources ("capital") constrain the scope for human actions. In other words, that the two kinds of capital are complementary.

The focus of countries in monitoring progress towards achieving sustainable development measured through an agreed indicator set has generally been on meeting the information needs of a national sustainable development strategy. It is relatively rare that such policies are formulated on the basis of an explicitly defined conceptual framework. Nevertheless, they should be the result of rigorous consultations inside and outside local government to ensure that different perspectives on how sustainable development should be defined are taken into account.

D.10.3. Sources of data and metadata

D.10.3.1 SUSTAINABLE DEVELOPMENT GOAL INDICATORS

Following internal and open consultations, the IAEG-SDGs proposed a monitoring framework for the SDGs. This was agreed by the UN Statistical Commission in March 2016.

This framework covers 231 unique indicators, with each of the 169 SDG targets being covered by at least one indicator (9 of the 231 indicators relate to 2 or 3 different targets).

At regional, national, and sub-national levels, the SDIs are to be adapted by countries and regions to reflect their specific circumstances and to complement the global SDG indicators.

For thematic indicators, the IAEG-SDGs continues the development in consultation with the relevant concerned parties. For example, UNESCO's Institute for Statistics (UIS) chairs the Technical Advisory Group developing thematic indicators on education, which also includes experts from the Education For All Global Monitoring Report, OECD, UNESCO and UNICEF.

In 2016, the UN Secretary-General released the first Sustainable Development Goals Report, based on information provided by the SDG global indicators. The report provides a baseline of where the world stands at the beginning of the efforts towards achieving the SDG. At the same time, the SDG Global Database was launched. This database presents country level as well as global and regional data. The website also contains the metadata repository for all SDG indicators.

In 2020, the COVID-19 pandemic had a devastating impact on progress towards achieving the 2030 Agenda. The importance of timely, quality, open and disaggregated data and statistics has never been as clear as during the COVID-19 crisis. Such data are critical in understanding, managing and mitigating the human, social and economic effects of the pandemic.

They are also essential for designing short-term responses and accelerated actions to put countries back on track to achieve the SDGs.

Turning the ambition of the SDGs into reality will require robust data to capture progress and evidence to inform decision-making. The OECD is helping countries to track progress in areas such as trust, health inequalities, green growth, income and consumption inequality, and job quality. It supports countries in developing and using environmental and green growth indicators and in achieving environment-economy integration over time. The OECD also supports partner countries in building their own statistical capacities and systems through the PARIS21 partnership.

Box D.10.3: Matrix for SDG indicators dimensions

Data availability	Relevance			
	Relevant	**Related indicator relevant**	**Relevant but missing**	**Irrelevant**
Available	**1**	**2**	**3**	**4**
Potentially available	**1**	**2**	**3**	**4**
Related data available	**2**	**2**	**3**	**4**
Not available	**4**	**4**	**4**	**4**

Legend: 1: to be used; 2: modified for national context; 3: to be identified; 4: not available in or irrelevant for the country.

The darkest boxes (1) contain indicators that can be incorporated without any changes to national indicators. The dark blue boxes (2) are for those indicators that have to be modified for a given country, either because there exist related and more relevant or specific indicators or because data for the original indicator cannot be made available. The light blue boxes (3) contain those indicators important for a country but not included in the SDG set. The plain boxes (4) are either irrelevant to the country or not available.

Source: Measuring distance to the SDG targets 2019, an assessment of where OECD countries stand

D.10.3.2 ROLES AND RESPONSIBILITIES FOR SDG MONITORING AND REPORTING

The national level

Countries are the centre and starting point for all monitoring and oversee national monitoring via their national statistical system. The national statistical system comprises the National Statistical Office (NSO), line ministries and other national institutions. It is up to the countries themselves to decide on the level of detail of data and metadata they wish to share with the custodian agencies, and to what extent these should be published. The minimum requirement is one national aggregate per indicator. However, by sharing more detail on the subcomponents of the indicators and the monitoring methods, and at a higher level of disaggregation, the data will be more credible and useful for different audiences.

The SDG global indicators only represent a subset of the full suite of indicators monitored in a country. Countries are welcome to share additional relevant data sets with the custodian agencies and directly with the High-Level Political Forum (HLPF), through their voluntary national reporting.

The role of the national statistical systems is crucial in the SDG Review and reporting process. The SDG review process has to draw on the entire NSS, involving all relevant ministries and government agencies and in particular the NSO, that regularly collect data. Thus, there is a need to set up a single, integrated national database containing all the information required for the overall 2030 Agenda for Sustainable Development, as well as for addressing global challenges. Integrated information should ensure data interoperability, timeliness, disaggregation, flexibility, integration, sharing and autonomy.

Implementing the SDG review and reporting process implies that:

- National, subnational and local reporting levels are the most significant levels of the SDG review process.
- The global SDG monitoring system builds on national data reporting:
  - Data are derived from national sources in the foundation of SDG reviews at all levels.
  - There is a need to create opportunities for countries to directly contribute to global reporting.

The global level

Based on the premise that a robust follow-up and review mechanism for the implementation of the 2030 Agenda for Sustainable Development requires a solid framework of indicators and statistical data to monitor progress, inform policy and ensure accountability of all stakeholders, the UN Statistics Division (UNSD) is building a Global Data Hub that will incorporate a network of national SDG Data Hubs, linked together to the Global Data Hub.

At the global level, custodian agencies are United Nations bodies (and in some cases, other international organizations)

who have been granted the responsibility to compile and verify country data and metadata, and for submitting the data, along with regional and global aggregates, to UNSD. These agencies may publish the country data in their own databases and use them for thematic reporting. The country data need to be internationally comparable. To this end, the agencies are also responsible for developing international standards and recommending methodologies for monitoring.

Box D.10.4 : Distribution of SDG indicators by major custodian agencies

International Organisation	SDG number (number of indicators per Goal)
FAO	SDG 1 (1); SDG 1 (1); SDG 1 (1); SDG 1 (1)
ILO	SDG 1 (2); SDG 8 (9); SDG 10 (1)
IMF	SDG 8 (1); SDG 10 (1); SDG 17 (2)
ITU	SDG 1 (1)
OECD Focal Point	SDG 1 (1); SDG 2 (1); SDG 3 (1); SDG 4 (1); SDG 6 (1); SDG 8 (1); SDG 9 (1); SDG 10 (1); SDG 15 (2); SDG 17 (5)
OHCHR	SDG 10 (2); SDG 16 (3)
PARIS21	SDG 17 (2)
UIS/UNESCO	SDG 1 (1); SDG 4 (9); SDG 6 (1); SDG 9 (2); SDG 11 (1); SDG 12 (2); SDG 13 (1); SDG 14 (2); SDG 16 (2)
UN Disaster Risk Reduction	SDG 1 (11)
UNDP	SDG 16 (6)
UNEP	SDG 6 (1); SDG 8 (4); SDG 12 (7)
UN-Habitat	SDG 1 (2); SDG 6 (1); SDG 11 (8)
UNICEF	SDG 2 (2); SDG 3 (4); SDG 4 (1); SDG 5 (2); SDG 16 (3)
UNIDO	SDG 9 (7)
UNODC	SDG 9 (5)
UN-Women	SDG 5 (6)
Various UN Agencies	Other SDG and related indicators
WHO	SDG 2 (2); SDG 3 (16); SDG 6 (3); SDG 7 (1); SDG 11 (1)
World Bank	SDG 1 (3); SDG 7 (1); SDG 8 (1); SDG 9 (1); SDG 10 (4); SDG 16 (2); SDG 17 (2)
WTO	SDG 2 (1); SDG 8 (1); SDG 12 (1)

Another central responsibility of the custodian agencies is to strengthen national monitoring and reporting capacity. When country data are missing, collected using a different methodology or inconsistently reported by different sources, agencies may need to do estimates or adjust the data together with the specific countries. All final data to be submitted to UNSD will first be validated and approved by countries.

Another example of monitoring progress towards achieving SDGs at the global level with potential application at the national level, is the SDG Tracker, a joint collaborative effort between researchers at the University of Oxford and the Global Change Data Lab. SDG Tracker is an open-access project to track the latest data across all of the 17 SDGs. This serves an interactive hub where users can explore and track progress across all of the SDG indicators for which there is data available. The SDG Tracker presents data across all available indicators from the Our World in Data database, using official statistics from the UN and other international organizations. It is a free, open-access publication that tracks global progress towards the SDGs and allows people around the world to hold their governments accountable to achieving the agreed goals. A specific application for Bangladesh is presented in the box below.

Box D.10.5: SDG Tracker for Bangladesh

In order to enable tracking its progress towards attainment of SDGs and other national development goals, Bangladesh has tailored a national version of the SDG Tracker, through a web-based information repository. A unique, searchable database provides a snapshot of what those global and national priorities are. Users can get the latest updates of the status of implementation of those goals along with the facilities of data visualization in multiple ways.

To ensure Sustainable Development Goals in Bangladesh by leaving no one behind in the most possible short time, a set of 39 indicators has been selected under the instructions of SDG Working Committee of The Prime Minister's Office. Under this process, some of the indicators are selected from the global Sustainable Development Goals and some of the indicators are selected after modification on Bangladesh perspective. All relevant ministries are connected with this process.

The UNSD has also developed a website where users can explore progress towards achieving SDGs for all individual countries and areas around the world. Country profiles covering results of the SDGs and associated targets and indicators at the national level are available.

The Organisation for Economic Cooperation and Development (OECD) has developed its own SDG Pathfinder for monitoring progress on SDG targets. The SDG Pathfinder is an open digital discovery tool that applies an SDG lens to policy content from six international organisations. Content coverage includes curated analysis (books, chapters, articles, papers etc.), extracted via artificial intelligence based on advanced machine-learning technologies and natural language processing.

D.10.3.3 EU SUSTAINABLE DEVELOPMENT INDICATORS

The European Commission is committed to monitoring progress towards the SDGs in the EU context. Since the adoption of the first EU SDG indicator set in May 2017, Eurostat has led the further development of the indicator framework in close cooperation with other Commission services, the European Environment Agency, and Member State organisations in the European Statistical System (ESS), involving also Council Committees and Working Parties as well as the civil society.

The EU SDG indicator set is structured along the 17 SDGs and covers the social, economic, environmental and institutional dimensions of sustainability as represented by the Agenda 2030. Each SDG is covered by five to six main indicators. They have been selected to reflect the SDGs' broad objectives and ambitions. Out of 100 indicators, 33 are 'multi-purpose', meaning they are used to monitor more than one goal. This allows the link between different goals to be highlighted and enhances the narrative of this monitoring report. 68 of the current EU SDG indicators are aligned with the UN SDG indicators.

The UN indicators are selected for global level reporting for countries at all levels of development and are therefore not always relevant in an EU context. The EU SDG indicators have been selected to take into account their policy relevance from an EU perspective, availability, country coverage, data freshness and quality. They have strong links with EU policy initiatives, which means that preference is given to indicators which are also part of a high-level scoreboard of EU policies such as the Social Scoreboard for the European Pillar of Social Rights Action Plan or the Monitoring Framework for the 8th EAP. The EU SDG indicator set is open to regular reviews to consider new policy developments and include new indicators as methodologies, technologies and data sources evolve over time. The reviews involve many Commission services, European agencies such as the European Environment Agency (EEA), Member State institutions in the ESS, Council Committees and Working Parties as well as the civil society.

Based on the most recent EU SDG indicator set, the SDG monitoring reports also provide an assessment of trends vis-à-vis SDG-related EU objectives and targets, visualised by arrow symbols. The assessment method considers whether an indicator has moved towards or away from the sustainable development objective, as well as the speed of this movement.

Box D.10.6: Key features of the EU SDG indicator set

The following principles are applied to frame the EU SDG indicator set:

- The EU SDG indicator set is structured along the 17 SDGs and is balanced among the social, economic, environmental and institutional dimensions of sustainability as represented by the Agenda 2030's text for each goal.
- The EU SDG indicator set consists of maximum 6 indicators per goal to attach equal importance to all goals and to limit the indicator set to around 100 different indicators, which is widely recognised as an upper limit for effective and harmonised reporting by experts from National Statistical Offices, OECD, Eurostat and many others.
- The EU SDG indicator set includes multi-purpose indicators (MPIs) which are used to monitor more than one goal. As a result, each goal is monitored through 5 to 12 indicators in total with the current set.

D.10.3.4 EXAMPLES OF REGIONAL AND NATIONAL SDI FRAMEWORKS

Latin America and the Caribbean - Argentina

A good example of a policy-driven, regionally adapted framework for SDIs is the framework developed by the Economic Commission for Latin America and the Caribbean (ECLAC). The conceptual framework was developed through the Latin America and the Caribbean delegations in the HLPF.

ECLAC has developed a number of information systems related to economic and social development in the Latin American and Caribbean region. These systems are available for governments and institutions of the region through direct request to the corresponding divisions, including CEPALSTAT, which is the gateway to all the statistical information of Latin America and the Caribbean countries collected, systematized and published by ECLAC, and REDATAM which creates and processes hierarchical databases from censuses, surveys, vital statistics and other sources for local, regional, and national analyses and produces thematic maps.

The Argentinian System of Sustainable Development Indicators (SIDSA) presents a good example of a national adaptation of the ECLAC framework. The national government mandated the Consejo Nacional de Coordinación de Políticas Sociales (CNCPS) as the office in charge to prioritizing certain SDGs in accordance with the government's initiative "Poverty Zero" focusing on eliminating poverty in Argentina.

In April 2016, CNCPS coordinated and convened a National inter-institutional Commission for the implementation and follow-up of the SDGs, which involved all ministries. The Commission initiated a process of adapting the prioritized SDGs through six working groups. The result was the creation of a basis for monitoring progress towards the achievement of

the SDGs in line with national objectives. An online platform was created to help monitor progress.

CNCPS also assists the provincial governments in their efforts to adapt the SDGs to the provincial reality, offering technical support in each of the stages of this process. As part of this, CNCPS prepared a Guide for the SDG Adaptation Process by the Provincial Governments, offering tools that help the provincial technical teams to achieve their respective objectives.

Asia and Pacific - Vietnam

On the request of its member states, ESCAP provides support for:

- Promoting the balanced integration of the three dimensions of sustainable development and providing annual updates and recommendations to member states;
- Supporting the process to define a regional road map for implementing the 2030 Agenda and to address challenges to its achievement in Asia and the Pacific;
- Strengthening support to member states in their efforts to implement the 2030 Agenda in an integrated approach; and
- Continuing to provide capacity-building opportunities to member states, leveraging existing expertise and its intergovernmental forum to contribute to the strengthening of their capacity.

The Asia-Pacific Forum on Sustainable Development (APFSD) is the preeminent platform for follow up and review of the 2030 Agenda and the Sustainable Development Goals in the Asia-Pacific region. Regional process and dialogue strengthen the delivery of the means of implementation while subregional dialogue brings governments together to plan for cooperation and prioritizing action at the subregional level. The Sustainable Development Goals – Tracking Progress and Engaging Stakeholders in Review is a complex and ambitious framework for transformative change. ESCAP is also supporting monitoring, review and follow up on the SDGs through its work on statistical capacity building, knowledge products such as the SDG Progress Report, a dedicated data portal on the SDGs (Asia-Pacific SDG Gateway), close engagement of the Asia-Pacific Regional Coordination Mechanism as an inter-agency coordination mechanism for the United Nations system at the regional level, and a partnership with the Asian Development Bank (ADB) and with UNDP (Asia-Pacific SDG Partnership) that produces high-quality knowledge products to support follow-up and review of the 2030 Agenda and the SDGs.

The latest "Asia and the Pacific SDG Progress Report" was published in March 2023. It analyses trends as well as data availability for monitoring progress toward the SDGs in Asia and the Pacific and its five subregions. It assesses gaps which must be closed to achieve the goals by 2030. The report advocates for the strengthening of the capabilities of national statistical systems (NSS) for overcoming the big challenge to fill data gaps in the decade ahead to achieve the SDGs. The 2030 Agenda is guided by a set of principles, including that the review of progress towards the goals will be based primarily on national official data sources. Furthermore, annual progress reports on the SDGs to inform the follow-up and review at HLPF follow the global indicator framework using data produced by NSS and information collected at the regional level.

ESCAP has also established an SDG Help Desk in response to requests for capacity development support from member States. As its main function, the SDG Help Desk works as a gateway to resources and services, by linking users to other sectoral online platforms, focusing in areas related to the implementation of the SDGs and the 2030 Agenda. The SDG Help Desk serves as the primary modality for coordinating ESCAP's support to member States in specific priority areas such as integration of the three dimensions of sustainable development, stakeholder engagement, and effective follow-up and review.

In Vietnam, a substantial investment has been made for treating the SDGs as a national policy for achieving economic and social development. In 2018, the country undertook a review of the implementation and monitoring progress towards SDGs and targets. Lessons learned are presented in the box below.

Box D.10.7: Lessons learned from implementing SDGs in Vietnam, 2018

Vietnam emphasizes and is applying the "whole-of-society" approach which engages all stakeholders, with a special attention to mobilize participation and contribution of the private sector, NGOs, and other organizations. Vietnam has established the National Council on Sustainable Development and Competitiveness Enhancement. The Vietnam Business Council for Sustainable Development has been also formed to promote the business sector's engagement in SDG implementation.

The Government of Vietnam is fully aware that the SDG implementation comes at a significant cost. Therefore, a priority has been given to the allocation of Government budget for implementing the SDGs. ODA, FDI and remittances are important sources for SDG implementation in Vietnam. To achieve success in 17 SDGs, Vietnam will continue to enhance mobilization of all resources, especially from the private sector and promote public finance. Vietnam has been formulating the National Roadmap and Indicator System for SDG Monitoring & Evaluation.

A recent feasibility review of 231 global SDG statistical indicators showed that only 123 indicators were feasible in Vietnam. Many SDG indicators did not have metadata or needed to be newly collected, with complicated calculation methods, and/or with data from non-conventional sources.

Despite the initial SDG achievements, Vietnam is facing various difficulties and challenges in SDG implementation, such as climate change, environmental degradation and others. SDG implementation demands huge financial inputs, while the State budget remains limited.

There are also challenges in monitoring and reporting SDG progress. Vietnam identified the following next steps for SDG achievement:

- Enhance SDG awareness among all stakeholders at all levels.
- nvolve all stakeholders in implementing SDGs and promote coordination among stakeholders.
- Formulate a system of statistical indicators for SDG Monitoring & Evaluation.
- Enhance resource mobilization, especially from private sector.
- Integrate SDGs into annual and five-year Socio-economic development plans, strategies and sectoral and local policies.
- Strengthen international cooperation to promote technical and financial support and knowledge transfers for SDG implementation.

Source: Statement by the Head of Vietnam Delegation to the High-level Political Forum of the UN ECOSOC, 2018

Bhutan is guided by the development philosophy of Gross National Happiness. In its main message for the 2018 Voluntary National Review, Bhutan reiterates its commitment to realizing the 2030 Agenda for Sustainable Development. The country is gearing to graduate from the Least Developed Country category on completion of its 12th Five Year Plan period (2018-2023). The 12th Plan will be Bhutan's transition plan to non-LDC status during which concerted national efforts will continue towards implementing the Sustainable Development Goals (SDGs).

Despite progress made, Bhutan is still confronted with the following challenges in its development efforts:

- In ensuring that no one is left behind, by particularly addressing the needs of vulnerable groups, promoting gender equality and empowering women and girls.
- Enhancing productive capacity to develop economic resilience that is vital to sustainable graduation and achieving the SDGs.
- Further developing its human capital and taking advantage of its demographic dividend.
- Securing adequate and timely resources for sustainable graduation and effective implementation of the Agenda 2030.

Middle East and North Africa - Palestine

While the United Nations Economic and Social Commission for Western Asia (ESCWA) is supporting the implementation of the 2030 Agenda for Sustainable Development especially at regional levels, the 2030 Agenda is primarily country-driven, with Member States taking the lead and adapting it to their national realities. The Agenda recognizes new forms of multi-stakeholder partnerships, including a stronger role for civil society, the private sector and other development partners. It also strongly focuses on accountability and clearly recognizes three levels of follow-up and review at global, regional, and national levels.

Despite the tremendous challenges the Arab region has been facing in the last decades, several countries have already made notable efforts towards socio-economic development by implementing recommendations from other global frameworks. However, achieving the 2030 Agenda for Sustainable Development and its 17 SDGs will require tackling development issues in a new interdisciplinary way that addresses both national and regional challenges, especially linked to the effects of conflict.

The Arab Sustainable Development Report issued in June 2020 by the United Nations entities working in the Arab region, led by ESCWA, warned that the region would not achieve the SDGs by 2030. It then identified the barriers blocking transformation towards inclusive and sustainable development and suggested solutions to dismantle them.

One of the examples of best practices for identifying and implementing the 2030 Agenda at the national level, can be found in Palestine.

Box D.10.8: Lessons learned from implementing SDGs in Palestine

Based on the commitment of implementing the 2030 Agenda, the Palestinian Council of Ministries formed a National Team that was mandated to follow up the implementation of the SDGs in cooperation with all related stakeholders, including representatives from NGOs and the private sector. The Council of Ministries decree also mandated the Palestinian Central Bureau of Statistics (PCBS) to lead the efforts on modernizing and monitoring the SDG indicators in cooperation with all partners to provide the statistical data of the indicators and building the national system to monitor the progress in this regard.

Therefore, PCBS assessed the global framework of the SDG indicators, its relevance with the national context and the extent of the priority to work on it based on the strategic plans and the methodologies of working on it to provide the data with all related mechanisms including the data sources.

As a result, PCBS launched the database of the sustainable development indicators for public use with all feasible time series and disaggregation. This database was upgraded as an interactive one to facilitate and clarify the data presentation for the purposes of planning and decision-making as well as for report writing.

Within the framework of producing data that cover the sustainable development indicators, PCBS joined an international pilot project with twenty countries on Statistical Data and Meta Data Exchange (SDMX) led by the United Nations Statistics Division, as well as on the updating and using the Standardized Generic Statistical Business Process Model (GSBPM) framework.

The modernising and strengthening of statistical systems are the base for achieving the ambitious requirements of the SDGs. PCBS joined the High-Level Group for Partnership (HLGP), Coordination and Capacity Building for Statistics for the 2030 Agenda for Sustainable Development (HLG-PCCB) to represent the Arab countries. Moreover, PCBS participates in many international and regional initiatives to enhance this role, besides the active role on the national level.

Moreover, Palestine's National Policy Agenda - 2017–2022 (NPA), "Citizen First" is consistently aligned to the 2030 Agenda and the SDGs. The development of the agenda was followed by the development of an SDG-led National Strategy for the Development of Official Statistics NSDS (2018-2022). The NPA includes 128 SDGs indicators that are distributed on all goals.

The 2018 Voluntary National Review (VNR) sought to provide detailed information about the status of Palestine's path towards implementing and achieving the SDGs and was presented to the international community at the HLPF. The review highlighted the steps the Palestinian Government has taken to create an enabling environment for the localization and integration of the SDGs into national and cross-sectorial strategies, including the:

- Modernization of the National Statistical System.
- Creating Registers and Monitoring Directorate.
- Updating the Information Technology Infrastructure.
- Development of Geographical Information System.
- Development of Communication and Dissemination.
- Platform of SDG Indicators on PCBS main website.
- Raising Statistical Awareness on SDGs.
- Data Science Initiative.
- Capacity Building on SDGs.

In 2019, Palestine issued its first statistical report on the Sustainable Development Goals. The report comes as a road map for decision and policy makers to draw the appropriate interventions which allow the achievement of the goals of the 2030 Agenda. The report describes and presents available statistical figures on the SDGs in a time series framework, as well as addressing the main domains of focus and the main issues within each goal that allow the readers to highlight situations in which government has to intervene the most and how it can reach all Palestinian individuals so that no one is left behind.

D.10.4. Analysing data quality and identifying problems

Quality is a multi-faceted, relative concept that affects all aspects of the operation of an institution. Quality in official statistics covers not only the statistical outputs, but also the statistical processes that produce them and the institutional environment in which the statistical authorities operate.

This three-line approach is reflected in the Quality Assurance Framework (QAF) of the ESS that is based upon the European Statistics Code of Practice (CoP). The CoP sets the standard for developing, producing and disseminating European statistics, along the lines of the institutional environment, statistical processes and statistical output. A short Glossary explains the main terms used in the CoP.

The QAF of the ESS provides a template for the systematic assessment of the quality of indicators. Eurostat's mission is to provide high quality statistics for Europe. Accordingly, quality considerations play a central role in Eurostat's corporate management as well as in the day-to-day statistical operations.

The main feature of policy-driven indicators is their relevance to the formulation and monitoring of policy. This is a cornerstone of the assessment of the quality profiles, together with the indicator's contribution to an integrated policy analysis. The quality profile also documents the quality indicators with respect to the statistical quality dimensions most relevant to the indicator and its institutional framework (sources, legislation, etc.). As the ESS QAF is generic and focuses on common key quality criteria for indicators, it is straightforward to adapt and implement in any statistical system.

D.10.5. Methods for constructing a set of SDIs

D.10.5.1 PRINCIPLES FOR BUILDING AN SDG INDICATOR SET

The 2030 Agenda for Sustainable Development requires each country to produce a large number of statistical indicators, the frequency of data depending on the indicator and the country's level of development. The data are intended for use as a development map to monitor how countries, regions and the world as a whole are progressing towards attaining the SDGs.

Although the previous Millennium Development Goals indicators stimulated demand and coordinated international support for sustainable national statistical capacity building, they also led to debates about the quantity and quality of the data and associated metadata. These questions fundamentally centred on data availability, comparability, and national ownership of the indicators.

The IAEG-SDGs addressed a number of these issues in its work leading to the global monitoring framework and its indicators. However, the further process involves further development and critical review of these indicators, as well as the definition and implementation of work plans for this. Thus, in 2016, the IAEG-SDGs launched an open consultation on possible refinements to the global indicator framework. In January 2017, the UN and Statistics South Africa jointly arranged the first World Data Forum, bringing together public and private measurements experts, statistical producers, information system specialists, users, and other key stakeholders to discuss data for sustainable development. The IAEG-SDGs is currently preparing a comprehensive round of review of the global SDG indicators to be adopted in 2025.

The UN "Indicators of Sustainable Development: Guidelines and Methodologies" provides both a global list of sustainable development indicators and methodology for developing such indicators within each area. This is a good basis for developing a national set of SDIs. However, each country must define which SDIs are most relevant for its own policy purposes, e.g., as defined by the national Agenda 21 action plan.

A basic approach is to start by analysing national policy information needs and which statistics and indicators are already available or easy to construct based on existing sources. Policy makers and other stakeholders should be closely involved in this process, as the main goal of the SDIs is to inform policy makers and to monitor progress within the national sustainable development policies. Political support is vital; policy makers must need the SDIs for their planning, monitoring, evaluation, and political dialogue.

Existing surveys and management information systems (MIS) are key data sources. On this basis, a first set of national SDIs and associated metadata may be established. Further development should be focused on improving the quality of these first SDIs and on constructing indicators in priority areas poorly or not at all informed by the initial set of SDIs. In this context, coordination and networking are vital, bringing household surveys, enterprise surveys, and administrative records together. The initial set of SDIs needs to be operationalised, the theoretical framework established, and the necessary policy documents developed.

Some countries and international organisations use so-called composite indicators, such as the ecological footprint, genuine savings, and the human development index. This type of indicator attempts to combine different indicators into a single index. The lack of an empirical basis for weighting the different components implies that these indicators remain controversial.

A continuously debated issue remains the consistency between data and indicators published by the countries themselves and indicators published by international organisations. Such international indicators may convert or transform national data in order to comply with international definitions and increase comparability across countries, or they may be estimated for other reasons. The UNSD's country Data database provides concise comparisons between national and international estimates of development indicators.

D.10.5.2 EU SUSTAINABLE DEVELOPMENT INDICATORS (SDIs)

Sustainable development objectives have been at the heart of European policy-making for a long time, firmly anchored in the European Treaties and a mainstream part of key projects, sectorial policies and initiatives. The 2030 Agenda for Sustainable Development and its 17 SDGs have given a new impetus to global efforts for achieving sustainable development. The EU and its Member States are committed to this historic global framework agreement and to playing an active role in maximising progress towards the SDGs.

The von der Leyen Commission has made sustainability an overriding political priority for its mandate. All SDGs feature in one or more of the six headline ambitions for Europe announced in the Political Guidelines, making all Commission work streams, policies and strategies conducive to achieving the SDGs. Key elements of the Commission's "whole of government" approach for delivering on the 2030 Agenda include the design of deeply transformative policies such as the "European Green Deal" and the integration of the SDGs into the European Semester. The European Green Deal aims to transform the Union into a modern, resource-efficient and competitive economy where climate and environmental challenges are addressed and turned into opportunities, while making the transition just and inclusive for all. The Commission's overall approach towards implementing the SDGs is described in the staff working document (SWD) "Delivering on the UN's Sustainable Development Goals — A comprehensive approach".

Eurostat supports this approach through regular monitoring and reporting on progress towards the SDGs in an EU context. The results are published in "Sustainable development in the European Union – Monitoring report on progress towards the SDGs in an EU context", which provides a quantitative assessment of the EU's progress towards reaching the SDGs. The 2023 edition is the seventh edition. The publication is based on the EU SDG indicator set, which includes indicators relevant to the EU and enables the monitoring of progress towards the goals in the context of long-term EU policies. It is aligned as far as appropriate with the UN list of global indicators, but it is not completely identical. This allows the EU SDG indicators to focus on monitoring EU policies and on phenomena particularly relevant in a European context.

The Eurostat monitoring report is a key tool for facilitating the coordination of SDG-related policies at both EU and Member State levels. As part of this process, it promotes the ongoing assessment and monitoring of progress in implementing the SDGs, and helps to highlight their cross-cutting nature and the links between them.

This 2023 edition of the EU SDG monitoring report begins with a synopsis of the EU's overall progress towards the SDGs, followed by a presentation of the policy background at the global and EU levels and the way the SDGs are monitored at EU level. The detailed monitoring results are presented in 17 articles, one for each of the 17 SDGs. This is preceded by an analysis how the recent crises, such as the COVID-19 pandemic and Russia's invasion of Ukraine, have influenced the EU on its way towards achieving the SDGs, followed by an analysis of spillover effects. The report closes with a 'country overviews' chapter on status and progress of EU Member States towards the SDGs. The Annexes contain notes on methods and sources (available in paper format and as a downloadable PDF file).

D.10.5.3 QUALITY FRAMEWORK FOR SDIs

The quality of SDIs is closely related to their purpose of monitoring progress in priority policy areas. Thus, the relevance to policy makers in their decision-making and policy monitoring is central to SDI quality, together with aspects such as accuracy, comparability and timeliness. The Quality Assurance Framework of the European Statistical System provides a template for the systematic assessment of the quality of sustainable development indicators. It is straightforward to adapt and implement in statistical system also in partner countries.

There are a number of other tools available for assessing data quality. Two tools provided by the IMF are the General Data Dissemination System (GDDS), and the Data Quality Assessment Framework (DQAF). Further quality frameworks are the Quality Framework for OECD Statistical Activities and the ISO 9000 quality standard, albeit not directly related to statistics.

Available statistics must meet users' needs. Statistics comply with the European quality standards and serve the needs of European institutions, governments, research institutions, business concerns and the public generally. The important issues concern the extent to which the statistics are relevant, accurate and reliable, timely, coherent, comparable across regions and countries, and readily accessible by users. These dimensions can be defined as follows:

1. **Relevance** refers to the degree to which statistics meet current and potential users' needs for information
2. **Accuracy** refers to the closeness of estimates to the unknown true values, including respect for data confidentiality.
3. **Timeliness** refers to the length of time between the reference period of the event or phenomenon that the data describe and the data release date, when data becomes available; **Punctuality** refers to the length of time between the data release date and the target delivery date.
4. **Comparability** refers to the impact of the differences in applied concepts and measurement tools and procedures when statistics are compared between geographical areas, sectoral domains or over time; and Coherence refers to the adequacy of the data to be reliably combined in different ways and for various uses.
5. **Accessibility** and **clarity** refer to the conditions and modalities by which users can obtain, use, and interpret data.

More generally, statistical indicators should be:

1. Policy responsive.
2. Methodologically sound.
3. Easy to interpret.
4. Forming a balanced set over the sustainable development themes.

5. Sensitive to the change they are supposed to measure.
6. Measurable.
7. Updated regularly.
8. Not involving huge costs or imposing heavy statistical burdens.

It is not always possible to satisfy all these criteria simultaneously; compromises are often unavoidable. However, the main goal of SDIs is that they should monitor progress towards sustainable development strategies. Thus, they must be relevant to these policies and be comparable over time and space, i.e., across countries and regions.

D.10.5.4 SUPPORTING THE PRODUCTION AND DISSEMINATION OF SDIs

Investments in data and statistics are needed to maintain adequate coverage of all population groups as well as to guarantee the internal consistency, comparability and overall quality of data produced to advance implementation of the 2030 Agenda. For example, many countries would benefit from support to fully digitize their data collection instead of using traditional paper-based methods. This could include telephone and web-based surveys, and using administrative data along with newer, more innovative data sources to produce official statistics.

One important area of innovation is the integration of geospatial and statistical information. The integrated analysis and visualization of geospatially enabled data on SDG indicators enhances the ability of policymakers and the public at large to understand and respond to local circumstances and needs across geographic space and time. It also offers insights into data connections and relationships that can be further explored by combining traditional and non-traditional sources of data, statistics, and information.

To find out more…

Policy documents

- World Commission on Environment and Development: Our Common Future (1987)
- United Nations Conference on Environment and Development: Rio Declaration on Environment and Development and the Agenda 21 action plan (1992)
- World Summit on Sustainable Development: Johannesburg Plan of Implementation (2002)
- United Nations Millennium Declaration and the Millennium Development Goals (2000)
- United Nations: A World that Counts (2014)
- UN High-level Panel on Global Sustainability: 'Resilient People, Resilient Planet: A Future Worth Choosing' (2012)
- UN Conference on Sustainable Development (2012)
- UN Resolution 70/1 (2015): Transforming our world: the 2030 Agenda for Sustainable Development
- United Nations: Sustainable Development Goals
- European Commission Communication COM(2016) 739: Next steps for a sustainable European future - European action for sustainability
- European Commission Reflection paper: Towards a sustainable Europe by 2030 (2019)
- European Commission Communication COM(2019) 650: Annual Sustainable Growth Strategy
- President von der Leyen's Political Guidelines: A Union that strives for more- My agenda for Europe.
- Communication on a European Green Deal: a new growth strategy to transform the EU into a fair, inclusive and prosperous society, with a modern, knowledge-driven, resource-efficient and competitive economy where there are no net emissions of greenhouse gases in 2050, and which protects, conserves and enhances the EU's natural capital, and protects the health and well-being of citizens from environment-related risks.
- Communication on the Annual Sustainable Growth Strategy 2020 initiating the European Semester surveillance cycle and the first step in integrating the Sustainable Development Goals.
- Communication on the Green Deal Investment Plan: the EU strategy to boost sustainable public-private financing over the next decade.
- Proposal establishing Just Transition Fund.
- Communication on a Strong Social Europe for Just Transitions.
- Communication on Shaping Europe's Digital Future.
- Proposal to put into law the objective to make the EU climate neutral by 2050.
- Coordination of a common European response to the COVID-19 outbreak to tackle the health crisis and cushion the impact of this economic hit and ERAvsCORONA.
- Communication on a Union of Equality: Gender Equality Strategy 2020-2025.
- Communication on a New Industrial Strategy for Europe.
- A new Circular Economy Action Plan for a cleaner and more competitive Europe.
- Communication on an EU Biodiversity Strategy for 2030.
- Communication on a Farm to Fork Strategy for a fair, healthy and environmentally friendly food system.
- Joint Communication and the EU Action Plan on Human Rights and Democracy for 2020-2024.
- Communication on European Skills Agenda for sustainable competitiveness and social fairness and resilience.
- Package for fair and simple taxation including Communication on an Action Plan for fair and simple taxation supporting the recovery and Communication on Tax Good Governance in the EU and beyond.
- Communication on Stepping up Europe's 2030 climate ambition: Investing in a climate-neutral future for the benefit of our people.
- The New Pact on Migration and Asylum and accompanying legislative proposals and recommendations.
- Communication on Achieving the European Education Area by 2025.
- Communication on a new European Research Area.
- Proposal establishing an General Union Environment Action Programme to 2030.
- Communication on a Renovation Wave.
- Communication on a Chemicals Strategy for sustainability.
- Proposal for a Directive on adequate minimum wages in the European Union.

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Methodologies and frameworks

- Report of the Inter-Agency and Expert Group on Sustainable Development Goal Indicators (IAEG-SDGs) to the 47th session of the UN Statistical Commission (including list of proposed SDG indicators)
- United Nations Statistics Division: SDG Indicators metadata repository
- United Nations Statistics Division: E-Handbook on SDG Indicators and SDG indicators website
- United nations: Indicators of Sustainable Development: Guidelines and Methodologies
- Eurostat: Sustainable development in the European Union – Monitoring report on progress towards the SDGs in an EU context – 2023 edition
- Eurostat: SDG indicators – Goal by Goal and Quality Assurance Framework (QAF)
- European Statistical System: European statistics Code of Practice with related Glossary
- International Monetary Fund (IMF): Enhanced General Data Dissemination System(e-GDDS) and Data Quality Assessment Framework (DQAF)
- OECD: Measuring Distance to the SDG Targets 2019, An Assessment of Where OECD Countries Stand and SDG Pathfinder
- World Bank: World Development Indicators dashboards to monitor SDGs
- Economic Commission for Latin America and the Caribbean (ECLAC): SDG indicators
- UN Economic Commission for Europe (UNECE): Sustainable development and environment
- UN Economic and Social Commission for Asia and the Pacific (ESCAP): Sustainable Development Goals – Tracking Progress and Engaging Stakeholders in Review; SDG Helpdesk and Asia-Pacific SDG Gateway
- Examples of national frameworks: Argentina (including monitoring platform), Vietnam, Bhutan, Palestine

Other resources

- The Inter-Agency and Expert Group on Sustainable Development Goal Indicators (IAEG-SDGs)
- The SDG Global Database
- University of Oxford and the Global Change Data Lab: SDG Tracker; example Bangladesh
- United Nations High-Level Political Forum on Sustainable Development
- United Nations: World Data Forum
- United Nations: Sustainable Development Solutions Network (SDSN)
- United Nations Statistics Division: SDG country profiles
- Eurostat: Sustainable Development Indicators (EU SDI)
- Eurostat: SDG - Introduction (Statistics Explained article)
- European Commission DG International Cooperation and Development: The 2030 Agenda for Sustainable Development
- UN Economic and Social Commission for Asia and the Pacific (ESCAP): Asia and the Pacific SDG Progress Report 2023
- European Commission: Sustainable Development
- European Economic and Social Committee: Sustainable Development Observatory
- OECD: Development Co-operation Directorate (DCD-DAC) and Green growth and sustainable development
- PARIS21: National Strategies for the Development of Statistics (NSDS)
- United Nations Economic and Social Commission for Western Asia (ESCWA): Arab Sustainable Development Report 2020
- UN Economic Commission for Africa (UNECA): SDG Indicators Dashboard
- United Nations Development Programme - Global Policy Centre on Resilient Ecosystems and Desertification: Poverty-Environment Action for SDGs

Guide to statistics in European Commission development cooperation

SOCIAL STATISTICS

E.11 Justice and crime statistics

E.11. Justice and crime statistics

The chapter in brief

This chapter covers statistics that relate to the nature and extent of crime and the operation of the criminal justice system, providing a short overview of the subject. It also presents the main Sustainable Development Goals (SDGs) related to creating safer and more just societies and the indicators devised to monitor progress towards these targets.

Justice and crime statistics cover a very wide area of actors including law enforcement agencies, prosecution authorities, courts and correctional institutions. The chapter begins with a short description of the various components of a typical criminal justice system. It then identifies the main policy areas for which justice and crime statistics are used. It continues with a description of the many different types of justice and crime statistics before providing links to some of the more important sources of existing statistics for illustrative purposes. It then turns to some quality issues. It concludes with a discussion of some of the main aspects that need to be considered in building a sustainable justice and crime statistics system.

The aim is to provide guidance on how to build up or strengthen the capacities for the establishment of meaningful and reliable statistics in the field of crime and criminal justice. Because of the considerable differences in the forms of policing and criminal justice in different countries, it is possible only to provide a broad overview. A more detailed treatment of the subject is available in the UN Manual for the Development of a System of Criminal Justice Statistics.

E.11.1. Policy applications

E.11.1.1 THE CRIMINAL JUSTICE SYSTEM

History, customs and traditions, religious beliefs, civil conflict, economic and political factors, and values all play a fundamental part in the development of a country's criminal justice system. There are, therefore, a large variety of criminal justice systems in the world today. The two major models in the Western world are based on civil and common law traditions[1]. The civil law tradition is the older and more influential and forms the basis of criminal justice systems in Europe, Latin America and African countries. It is based on Roman law and seeks to encourage rules of conduct linked to the ideas of justice and morality. It relies on a written code and is mainly inquisitorial, even though in some countries turned into a more adversarial system or in a mixed one between the two. The common law tradition has its origins in England and forms the basis of criminal justice systems in many former colonies of the British Empire. It is derived from precedent and custom although written laws are also important. Judges play a central role and the system is adversarial.

A third important model is Sharia law based on traditional Islamic thought and is derived from the divine revelations of the Qur'an and the examples and sayings of the Prophet Muhammad. Some countries have a mixture of different models of criminal justice and the picture is further complicated depending on whether the nation's government is unitary, federal or confederate. Moreover, there are many informal systems of justice based on customary and indigenous traditions, which exist alongside the more formal systems.

A typical formal criminal justice system consists of a complex system of actors dealing with crime, offenders and victims. The police component is often made up of national, regional and local police agencies and a variety of specialised policing bodies dealing with drugs, traffic, health and safety, business, tax and environmental violations. The prosecution component is usually composed of a separate public prosecutor's office and public prosecutors in various government departments. The court component is made up of a range of different types of courts with varying levels of jurisdiction, a number of specialised courts, such as juvenile courts, and appellate courts. The prison component includes all types of custodial institutions from pre- to post-trial. The non-custodial section embraces a range of organisations responsible for supervising measures, such as probation or community service. A comprehensive system of justice and crime statistics collects statistics on the decisions made and outcomes for all the separate components as well as capturing throughput information, monitoring case outcomes and conducting victim surveys.

E.11.1.2 WHAT THESE STATISTICS ARE USED FOR

Justice and crime statistics have a wide variety of uses including:

- To provide a picture of the nature and extent of crime in society and the effectiveness of the response to it. Alongside other statistics on social harm, justice and crime statistics can serve as a social barometer on the wellbeing of a nation and the levels of harm and insecurity experienced by its citizens.
- To assess the extent to which the goals, objectives and targets of the whole as well as each part of the criminal justice system — the police services/law enforcement agencies, prosecution authorities, courts and custodial institutions — are being accomplished and whether the resources are being used efficiently and effectively.
- To plan for policy changes within different parts of the system or from outside the system. For example, if a law is passed to increase the severity of the sentence for a particular category of offence, it may be important to be able assess the impact on the size of the prison population.
- To inform budget and personnel decisions and lead to a better management of the courts and control institutions.

1 For a more extended discussion of different models of criminal justice systems, see for example: Robertson, C. and Das, D.K. (2008) An Introduction to Comparative Legal Models of Criminal Justice, London: CRC Press.

- To ascertain that all decisions and activities are compliant with international human rights obligations – including the duty not to wrongfully discriminate and the right to a fair trial in a reasonable time (Article 6 of the European Convention on Human Rights).
- To compare the nature and the extent of crime and punishment across different countries.
- To evaluate the functioning of the civil, commercial and administrative justice across different countries.

E.11.1.3 TYPES OF JUSTICE AND CRIME STATISTICS

Many countries already collect a range of justice and crime statistics for each of the major agencies within the criminal justice system. Police statistics may include information on recorded crime, 'clear-up' figures, and police use of selected powers, such as stop and search, arrest and detention. Prosecution statistics typically cover caseload data and show the number of cases not proceeded with, the total number of suspects prosecuted and outcome of cases. More sophisticated systems may collect statistics on specific issues, such as racially motivated offences or domestic violence as well as monitoring a range of performance indicators. Court statistics record the number of cases dealt with, the type of plea entered, the outcome of each case, any sentence given and some characteristics of those prosecuted such as age, sex, education and ethnic background. Punishment or disposal statistics record details of the number and characteristics of those sentenced to different forms of punishment such as imprisonment or probation. In addition, most systems collect a range of resource data on the number and characteristics of persons employed in each section and on levels of expenditure.

Box E.11.1: Indicative list of information included in justice and crime statistics systems

Police

- Number of offences recorded, by type of crime, place, date and time, modus operandi
- Number of persons arrested, by age, sex
- Number of persons stopped, searched and detained, by age, sex
- Number of persons prosecuted or otherwise dealt with, by age, sex
- Number of racially or politically motivated offences

Prosecution

- Number of prosecution cases not proceeded with, by age, sex
- Number of persons prosecuted by type of crime, age, sex

Courts

- Number of persons who pleaded guilty, by type of crime, age, sex, level of education
- Number of persons found guilty, by type of crime, age, sex, level of education
- Number of persons acquitted, by type of crime, sentence, age, sex
- Number of persons sentenced to imprisonment, by type of crime, age, sex, level of education
- Number of persons sentenced to imprisonment by length of sentence
- Number of persons fined, by type of crime, age, sex
- Number of persons given a community sentence, by type of crime, age, sex, level of education
- Cases filed, disposed, pending by legal status of the court process (criminal, civil/commercial, administrative)
- Clearance rate by legal status of the court process (criminal, civil/commercial, administrative)
- Disposition time by legal status of the court process (criminal, civil/commercial, administrative)
- Total backlog by legal status of the court process (criminal, civil/commercial, administrative)
- Backlog resolution by legal status of the court process (criminal, civil/commercial, administrative)
- Number of persons sentenced to probation
- Persons brought before criminal courts by legal status of the court process (convicted/acquitted)

Prisons and other disposals

- Number of persons in prison by category (awaiting trial, awaiting sentence and sentenced)
- Number of persons in prison by sex, age, education level
- Number of persons incarcerated in other types of penal establishment, by age, sex, education level
- Number of persons on a community sentence, by sex, age, level of education
- Number of persons on parole, by sex, age, level of education
- Number of mentally ill incarcerated
- Prison population growth
- Recidivism rate

Resource statistics

- Number of police officers, police civilian personnel, prosecutors, judges (professional and lay), prison officers and other penal establishment staff by age, sex
- Total police, prosecution, court and penal institutions budgets

The criminal 'event' forms the key element of any system of criminal justice and of crime statistics. It involves three components: a criminal act, an offender and a victim. Criminal acts are defined within the criminal laws of each state. Sometimes there are important differences between countries in the types of behaviour considered to be criminal. Every single criminal event may involve more than one criminal act, more than one offender and more than one victim or a series of acts against the same victim. The victim may not be an individual but an organisation such as a shop, bank or even the state itself. Classification schemes are used to categorise the legally defined behaviour groupings and clear and comprehensive instructions are required for recording criminal events involving a series of criminal acts and persons.

Information on the offender can be obtained at various stages in the criminal justice process. The most comprehensive information is normally collected on offenders in prison. Besides age, sex, residence, national origin – information that is normally routinely collected by the police – a range of detailed information, such as educational attainment, physical and mental health, membership of a criminal organisation, can also be collected on individual offenders. Thus, the further along the criminal justice process the richer the information that is typically obtained. However, information gathered at this stage is unlikely be representative of the offender population in general because of tendencies towards the differential treatment of specific groups in the population, such as the poor, mentally ill or those from ethnic minorities.

For crimes where victims are individuals, the characteristics of the victims and the type and severity of their experiences have been given much greater emphasis in recent times in common law systems. In a number of countries, police now routinely collect victim information. The most important development, however, has been the introduction of victim surveys, in part because of the limitation of police recorded crime statistics. These surveys are based on a random sample of the population and focus on ascertaining whether the respondent has been a victim of a crime over their life course or in the last year.

One of the most difficult decisions is whether to collect information on the ethnic origins of those who come into contact with the police or are subsequently dealt with in the criminal justice system. On the one hand, this information provides a means to monitor the performance of people working in the system in their duty to avoid discriminating against any persons on the ground of ethnicity. On the other hand, there are risks that the information collected could be misused. It is therefore imperative that if the information is collected there are measures to prevent misuse and stringent data protection measures built into the criminal justice statistics system.

Box E.11.2: Indicative list of information collected in victim surveys

- Victimisation in last five years and last year, by type of crime
- Victimisation in last five years and last year, by age, sex
- Attitudes towards police and crime prevention and punishment
- Attitudes towards crime and security
- Household and personal characteristics

Other agencies outside of the criminal justice system may also collect a range of statistics that enhance the understanding of criminal activity. They include, for example, statistics on drug production and consumption, trafficking of persons, arms and drugs, and money laundering and insider trading.

A huge part of court processes involves non-criminal cases, such as civil, commercial and administrative cases. This encompasses categories that can vary across countries but there are many that have a broad applicability, such as contracts between individual parties or corporations, family and juvenile matters such as divorces and custody of children, labour and social security cases, housing, property, damage compensation, bankruptcies, matters of intellectual properties, requests for asylum and other migration related requests and more. The functioning of the overall sector is a key issue from both an economic and a social perspective. The OECD addresses access to justice as 'core component of inclusive growth, sound democracies and a thriving investment climate'.

E.11.1.4 SDGS AND SDG INDICATORS RELATED TO JUSTICE AND CRIME

The global indicator framework for the SDGs has given renewed momentum to several areas of crime and criminal justice statistics, in particular relating to crime, violence (including violence against women and children), trafficking in persons, access to justice, corruption, illicit financial flows, firearms trafficking and wildlife crime.

The United Nations Office on Drugs and Crime (UNODC) is custodian or co-custodian agency for the indicators related to crime and criminal justice. The custodian agencies are United Nations (UN) bodies (or other international organisations). They compile and verify country data and metadata, and submit these to the United Nations Statistics Division (UNSD). The custodian agencies are also responsible for developing international standards, recommending methodologies for monitoring and strengthening national monitoring and reporting capacity.

SDG 16 'Promote peaceful inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels' is a transversal goal, cross-sectioning with many of the other SDGs. It is the main goal related to peace and safety in societies, and thus also to the issues of crime and justice.

Other SDGs relevant to crime and criminal justice statistics include SDG 8 'Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all' (forced labour, child labour), SDG 10 'Reduce inequality within and among countries' (smuggling of migrants, human trafficking) and SDG 11 'Make cities and human settlements inclusive, safe, resilient and sustainable'.

Box E.11.3: Policy areas in the 2030 Agenda for Sustainable Development and related targets and indicators relevant to crime and criminal justice statistics

SDG Targets		SDG indicators	
Violence reduction and crime prevention			
16.1	Significantly reduce all forms of violence and related death rates everywhere	16.1.1	Number of victims of intentional homicide per 100 000 population, by sex and age
		16.1.3	Proportion of population subjected to (a) physical violence, (b) psychological violence, and (c) sexual violence in the previous 12 months
		16.1.4	Proportion of population that feel safe walking alone around the area where they live
16.2	End abuse, exploitation, trafficking and all forms of violence against and torture of children	16.2.2	Number of victims of human trafficking per 100 000 population, by sex, age and form of exploitation
11.7	By 2030, provide universal access to safe, inclusive and accessible green and public spaces, in particular for women and children, older persons and persons with disabilities	11.7.2	Proportion of persons victim of physical or sexual harassment, by sex, age, disability status and place of occurrence, in the previous 12 months
5.2	Eliminate all forms of violence against all women and girls in the public and private spheres, including trafficking and sexual and other types of exploitation	5.2.1	Proportion of ever-partnered women and girls aged 15 years and older subjected to physical, sexual or psychological violence by a current or former intimate partner in the previous 12 months, by form of violence and by age
		5.2.2	Proportion of women and girls aged 15 years and older subjected to sexual violence by persons other than an intimate partner in the previous 12 months, by age and place of occurrence
Organized crime and illicit trafficking			
16.4	By 2030, significantly reduce illicit financial and arms flows, strengthen the recovery and return of stolen assets and combat all forms of organized crime	16.4.1	Total value of inward and outward illicit financial flows (in current United States dollars)
		16.4.2	Proportion of seized, found or surrendered arms whose illicit origin or context has been traced or established by a competent authority in line with international instruments
15.7	Take urgent action to end poaching and trafficking of protected species of flora and fauna and address both demand and supply of illegal wildlife products	15.7.1	Proportion of traded wildlife that was poached or illicitly trafficked
Access to justice, corruption and rule of law			
16.3	Promote the rule of law at the national and international levels and ensure equal access to justice for all	16.3.1	Proportion of victims of violence in the previous 12 months who reported their victimization to competent authorities or other officially recognized conflict resolution mechanisms
		16.3.2	Unsentenced detainees as a proportion of overall prison population
		16.3.3	Proportion of the population who have experienced a dispute in the past two years and who accessed a formal or informal dispute resolution mechanism, by type of mechanism
16.5	Substantially reduce corruption and bribery in all their forms	16.5.1	Proportion of persons who had at least one contact with a public official and that paid a bribe to a public official, or were asked for a bribe by those public officials, during the previous 12 months
		16.5.2	Proportion of businesses that had at least one contact with a public official and that paid a bribe to a public official, or were asked for a bribe by those public officials during the previous 12 months

Source: Report of UNODC on crime and criminal justice statistics to the UN Statistical Commission (2019)

E.11.2. Sources of data and metadata: data available from international sources

A range of justice and crime data are available at international, national and regional level. A few of the main sources are provided here to provide an illustration of the type and range of criminal justice statistics that are routinely collected.

UNODC is the central international source for data on crime and criminal justice. As custodian for the SDG indicators in this domain, it validates national data and metadata and provides these to the UNSD Global SDG Database, together with regional and global aggregates.

In addition, UNODC also manages a large collection of administrative and survey data on crime and criminal justice as well as crime victimization surveys, which provide statistical evidence on patterns and trends of crime, criminal justice, as well as for evaluation of policies and crime prevention measures.

The development of international surveys on crime and criminal justice is guided by a UN Roadmap to improve the quality and availability of crime statistics at the national and international level, adopted by the UN Statistics Commission in 2013[2]. This Roadmap covered the development of new standards and methodology to improve crime statistics, as well as initiatives to improve the capacity to produce and disseminate crime data, to improve international data collections and analyses, as well as actions to implement the Roadmap.

In 2019, UNODC presented a review and update of the Roadmap to the UN Statistics Commission.[3] This review and updated Roadmap analysed the Roadmap as a contribution to monitoring of the SDGs, presented progress and achievements in implementation of the Roadmap, and proposed updates with respect to development of methodological tools, capacity-building, international data collection and analysis, as well as strengthening the international framework for implementing the Roadmap.

Since 1977, UNODC has conducted periodic surveys on Crime Trends and Operations of Criminal Justice Systems (CTS), initially covering five yearly intervals from 1970. The aim of the surveys is to collect data on the incidence of reported crime and the operations of criminal justice systems with a view to improving the analysis and dissemination of the information globally. Over the years the content and focus of the questionnaires have altered but they have always covered the main components of the system – police, prosecution, courts and prisons. The frequency was increased from 5 to 3 years from 1995.

In 1989, the first International Crime Victims Survey (ICVS) was carried out in 14 industrialised countries. Further surveys were carried out in 1992, 1996, 2002, 2004-05 and 2010. The aim of the international victim surveys is to move beyond the limitations of police recorded crime data to provide more robust comparative measures of the extent of crime and victimisation as well as people's perceptions of crime and attitudes towards the criminal justice system. A standard list of offences is used in each country surveyed overcoming the problem of attempting to compare police crime data which are based on different national definitions. For guidance on how to carry out a victim survey, see the UNODC-UNECE Manual on Victimization Surveys.

There has been increasing international awareness and concern about the extent of violence against women, and as a result this has been a focus of data collection in recent years. In 1997, the European Institute for Crime Prevention and Control in Helsinki, Finland, affiliated with the UN (HEUNI) together with a number of international experts in the field started developing a comparative and standardised survey tool for measuring violence against women worldwide. The first 'International Violence Against Women Survey' (IVAWS) was conducted in 2003. The survey covered women's experiences, the consequences of violence and background information. It used a number of screening questions to establish lifetime victimisation followed by more detailed questions on prevalence and incidence.

Crime and criminal justice statistics have been available for the European Union (EU) since the Hague Programme gave a specific mandate to Eurostat in 2005 'to establish European instruments for collecting, analysing and comparing information on crime and victimisation and their respective trends in Member States, using national statistics and other sources of information as agreed indicators'. A series of measures for developing such instruments was outlined in a Communication from the Commission on 'Developing a comprehensive and coherent EU strategy to measure crime and criminal justice: an EU Action Plan 2006-2010' (COM/2006/0437 final). The results are published by Eurostat on its website. In addition, an EU survey on gender-based violence against women and other forms of inter-personal violence (EU-GBV survey) has been developed and data collection takes place over the 2020-2023 period. A complete system of statistics on crime and criminal justice to produce comparable data for all Member States has been put in place under the Stockholm Programme. These EU developments provide a useful example not only of crime related statistics but also of their collection on a regional as opposed to merely on a jurisdictional basis.

Two important sources of information on organised and transnational crime are Interpol and Europol. Interpol facilitates cross-border police co-operation to help prevent and combat international crime. It represents 188 member countries facilitating cooperation within the limits of the laws existing in the different countries and in the spirit of the 'Universal Declaration of Human Rights'. It can help even where diplomatic relations do not exist between its member states. Europol is a similar body encouraging and facilitating cooperation among European members states to prevent and combat terrorism, unlawful drug trafficking and other serious forms of organised crime.

2 UN Statistical Commission, Forty-fourth session, 26 February-1 March 2013: Report of the National Institute of Statistics and Geography of Mexico and the United Nations Office on Drugs and Crime on a road map to improve the quality and availability of crime statistics at the national and international levels (E/CN.3/2013/11)

3 UN Statistical Commission, Fiftieth session, 5-8 March 2019: Report of UNODC on crime and criminal justice statistics: Review of the progress made in the implementation of the road map (E/CN.3/2019/19)

Box E.11.4: Governance, peace and security statistics (GPS)

Within the frame of the Strategic Harmonization of Statistics in Africa (SHaSA), surveys on governance, peace, and security (GPS) are being carried out and the resulting statistics disseminated by national statistics offices (NSOs). During the period 2012-2017, African statisticians developed a harmonised methodology for periodic monitoring of GPS across Africa. The methodology for GPS-SHaSA surveys was piloted in 16 countries.

The GPS-SHaSA surveys provide a concrete example that survey-based statistics can provide information required for international and Africa-wide discussions about measuring GPS. The statistics provide evidence for monitoring the implementation of the 'Agenda 2063: The Africa we want', in particular its Aspiration 3: 'An Africa of good governance, democracy, respect for human rights, justice and the rule of law' and Aspiration 4: 'A peaceful and secure Africa'. The GPS-SHaSA statistics also provide a basis for monitoring the global indicators on SDG 16 (see section E.11.1.4). Indeed, progress towards SDG 16 is critical, as without peace and good governance, any other achievements accomplished under the SDGs will not be sustainable.

In 2014, the GPS-SHaSA survey was carried out in Burundi, with the GPS-SHaSA modules attached to a living standards survey (ECVMB). It sampled 13 116 adults, representative of the national population. The survey and the dissemination of results were supported by the EU under the Pan African Statistics programme and by the African Union.

Among others, Burundi provided data on the following 2023 Targets under the African Union Agenda 2063, with breakdown of responses by urban and rural population:

Aspiration 3: An Africa of good governance, democracy, respect for human rights, justice and the rule of law

- At least 70% of the people perceive the entrenchment of the culture of respect for human rights, the rule of law and due process.
- At least 70% of the public perceive elections to be free, fair and transparent by 2020.
- Zero tolerance for unconstitutional changes in government is the norm.
- At least 70% of the public acknowledge the public service to be professional, efficient, responsive, accountable, impartial and corruption free.
- At least 70% of the people believe that they are empowered and are holding their leaders accountable.

Aspiration 4: A peaceful and secure Africa

- Level of conflict emanating from ethnicity, all forms of exclusion, religious and political differences is at most 50% of 2013 levels.
- Silence all guns by 2020.
- Entrench the culture of peace.

Source: UNDP Africa: Governance, peace, and security in the Strategy for the Harmonization of Statistics in Africa (GPS-SHaSA); UNDP Africa: SHaSA: Governance, peace and security in Burundi, Côte d'Ivoire, Malawi, Mali and Uganda: Comparative survey-based data from NSOs towards the Sustainable Development Goals & African Union Agenda 2063; GPS-SHaSA survey in Burundi (leaflet)

E.11.3. Quality aspects

The concept of quality in statistics is extensively covered in chapter C.6 of this ***Guide*** and in the European Statistics Code of Practice. Quality of statistics is often defined as 'the fitness for use' by end users. It covers the institutional and organisational environment, statistical processes and statistical outputs. Important institutional or organisational factors include: the extent of professional independence, the mandate for data collection, the adequacy of resources, the quality commitment, statistical confidentiality, impartiality and objectivity. In terms of statistical processes, consideration must be given to the utilisation or development of sound methodologies and appropriate statistical procedures. The burden on respondents should not be excessive and it should be cost-effective. In terms of statistical output, the statistics must be relevant, accurate and reliable, timely, coherent, comparable across regions and countries, and readily accessible by users.

The most important quality issue in justice and crime statistics relates to how well the statistics measure the nature and extent of crime and offending behaviour in society. The key problem is that criminal events are difficult to capture and both police-recorded crime statistics and victim surveys have a number of important limitations. Similarly, prosecution and court statistics are a record of decisions taken rather than a representative picture of crime, victims and offenders. Therefore, it is crucial to always be aware of the different limitations of and problems with each kind of crime-related statistics.

Police-recorded crime statistics, for a variety of reasons, capture only a proportion of the total crimes committed. Many crimes are not reported to the police: the victim does not consider the crime to be serious; they do not want to be involved in the criminal process; they do not consider that the police could do anything about the crime; their previous contacts with the police have been negative and they have no confidence in them; the crime was humiliating and they do not want to add to their humiliation; they do not want to self-incriminate themselves as they were involved in the crime. Moreover, often for a variety of reasons, the victim is unaware or unwilling to report that a crime had been committed. For example, women may be unwilling to report domestic abuse.

There are a growing number of 'new' types of crime including for example cybercrime, fraud, counterfeiting, human trafficking, money laundering and terrorism. Many of these criminal activities are in fact not new but they have taken advantage of technological developments to assume different

forms. Such 'new' crimes typically display a high degree of criminal organisation, so they are sometimes categorised under the heading of 'organised crime'. This term is the subject of a formal definition by the UN , but it is difficult to implement for unsolved crimes as some of the criteria involved require a conviction to have been obtained. Another term met with in this context is 'transnational crime', reflecting the fact that many criminal organisations have adopted modern communication methods that make national borders largely irrelevant. It is precisely because of these characteristics that international bodies like the UN and the EU are in the forefront of attempts to combat these crimes, and collaboration at international level is therefore important in the development of the appropriate statistical indicators and measurement instruments.

Another quality issue is that there will always be a gap between the actual amount of crime committed and what becomes known to the police. This gap is often referred to as the 'dark figure'. Another possible reason for non-recording is that there is a police attitude that discourages the registration of misdemeanour crimes or, in the case of corrupt police, even the most serious ones.

Because of all these problems with police-recorded crime, crime victimisation surveys have been developed to provide a complementary data source to police statistics. However, victimisation surveys also have a number of limitations. Typically, surveys cover only people aged 16 and over and exclude those of no fixed abode. They rely on the memory of the respondent to recall criminal events. The format of the questionnaire, with its emphasis on crime harms, may compel the respondent to exaggerate or make up crime events or their fear of crime, to please the interviewer. Different cultures, classes and social groups both nationally and internationally report similar experiences differently suggesting that a respondent's understanding of victimisation may be very different. As with police-recorded crime, victim surveys will seldom capture organised as well as many types of financial and economic crime.

Justice statistics relating to the police, prosecutions and the courts also have their limitations. They are records of decisions taken at different stages in the criminal justice process and are made in different social and legal contexts. They are products of interactions and demands within and beyond the system. Statistics are drawn up mainly for organisational and administrative purposes and may not respond to requests for other detailed information. They provide much useful information on the operation of discretion or the workload levels in different parts of the system, but how far they can be considered representative of criminal and offending behaviour is very much a matter of debate among criminologists.

There are two important complications related to justice statistics recorded at different stages of the judicial process. First, a crime reported to the police and classified/qualified under the criminal code is often subsequently re-qualified by the prosecution service or later the court, with the consequence that it will figure under different qualifications in the police and the justice statistics, which are generally kept separate and where no cross-checking takes place. For example, a crime registered as a murder by the police might be re-qualified by the court as an involuntary homicide, but it will probably continue to stay in the crime statistics of the police as a murder. Second, the information recorded by the police in one year will relate to court cases in a following year making it difficult to make comparisons between police and justice statistics. The attrition rate can be used to measure the reduction of the number of persons within the criminal justice system during the process, from first contact with the police to conviction.

A broader concern with both police and criminal justice statistics is that they may be misused. Levels of crime and the effectiveness of the police and the courts in preventing and detecting criminal behaviour are very sensitive issues in any society. There will therefore always be pressure to present the data in the best possible light and to play down or not publish trends that indicate deterioration in public security. It is therefore imperative that robust systems are put in place to prevent the misuse of these sensitive statistics.

E.11.4. Key issues in building a system

This subsection focuses on some of the broader issues involved in building a system of justice and crime statistics.

Any system of justice and crime statistics must reflect the offences defined under the national criminal law, but also the needs and customs of the country and its system of governance. It must also take into consideration the availability of people with the necessary legal, statistical and computing skills, the level of technical resources and existing demands on public expenditure. In addition, international norms should be taken into consideration.

These elements will influence the type of organisational structure that is chosen. There is no standard structure. Some countries have a centralised approach, where one governmental agency has responsibility for the collection, processing and dissemination of all justice and crime statistics. The agency may be part of the justice ministry or of the national statistics office or totally independent of government. Alternatively, the responsibilities may be devolved to agencies at regional level. This decentralised approach is often found in countries with federal structures.

In making the decision on the form of organisational structure, it is important to consider which form will best achieve professional independence, statistical confidentiality and impartiality and produce the best quality data within the necessary resource constraints. To avoid any possibility of misuse of crime and justice statistics serious consideration should be given to placing the responsibility for their collation and dissemination in an independent agency. Whichever form is chosen, a key aspect is developing strong relationships between the statistical agency and all parts of the criminal justice system as well as with outside bodies, such as research institutes and universities.

As the criminal justice system consists of a complex system of actors, it is essential to define the scope of the justice statistics system. It is impossible to collect statistics on all aspects without considerable costs. First, it is necessary to define clearly the purposes of the system. Is it to cover administration, planning, policy, research and analysis or it is to have a more limited remit? Second, the users, both current and potential, need to be identified. Thirdly, decisions need to be taken about what types of information are to be collected and by whom and how the information is to be transformed into statistics and submitted to a central system. Finally, once the statistics have been collated, decisions need to be made about which government agencies should receive the data, how often, in what form and how and when the statistics should be published.

Most systems of criminal justice and crime statistics provide information on the following main substantive areas: the nature, the extent and trends in crime; the characteristics of offenders and victims; the volume of activity in the system – crimes reported, stop and search, arrests, and summons, prosecutions, disposals and offenders in custody or under supervision; resources deployed, including personnel and expenditure; citizen's views and attitudes about crime and criminal justice. These statistics need to be related to social, economic and demographic information to produce rates of the phenomenon of interest. For example, a normal practice is to show the number of offences or the number of people in prison per 100 000 of the population. Similarly, criminal justice expenditure figures may be represented in relation to the size of the population in different areas.

At the heart of all systems of justice and crime statistics is a detailed legal definition of criminal offences that is used at all stages in the criminal justice process. Criminal laws generally first distinguish between categories of crime, such as violent crimes, property crimes, drug offences and traffic offences. In each category the specific legal definitions of each offence are then included. For example, violent offences generally cover legal definitions for criminal offences, such as homicide, robbery, kidnapping, sexual assault and non-sexual assault. The way criminal behaviour is defined will depend on the country's legal system. Increasingly, defining crimes in terms of the gender of the offender and victim is viewed as important in order to assess the level of violence against women.

As all the segments in the criminal justice system are connected and the decisions taken at one stage in the process will affect the decisions taken at the next stage, it is important to develop statistics which are able to monitor the movement of suspects, cases, charges or crimes through the system. This involves making decisions about which to monitor. At each stage, different information is collected. Typically, the police keep details on crimes, suspects, charges and victims. The courts deal with cases, charges and convictions, and prisons and non-custodial institutions collect information on inmates and offenders. A criminal act reported to the police may involve a number of crimes, offenders and victims. It may produce a number of cases in the court and a number of offenders sent to prison. People, including suspects of the police, form the most important common unit at all stages in the process. Using a person identifier, it is possible to link the different parts of the system together. People are not, however, the only monitoring unit of interest. Crimes, charges, cases, disposals and length of the judicial processes are also important.

Devising a criminal justice and crime statistics system is complex and requires an incremental approach and a detailed assessment of the cost and purpose of each data element. It also requires a careful analysis of the type of information that is already routinely collected by different parts of the system and how this could be adapted to meet broader requirements. Demands for more detailed information are often likely to exceed the resources available.

E.11.5. Data protection

The collection and processing of data on policing and criminal justice should only be carried out under suitable specific safeguards in order to eliminate errors, to prevent misuse of the data and to uphold the privacy rights of the individual. Data security needs to be built into the system at all levels and detailed protocols are required in terms of data use and exchange. Europe provides a model for the protection of data. ***Article 8 of the Charter of Fundamental Rights of the European Union states***:

1. Everyone has the right to the protection of personal data concerning him or her.
2. Such data must be processed fairly for specified purposes and on the basis of the consent of the person concerned or some other legitimate basis laid down by law. Everyone has the right of access to data that has been collected concerning him or her, and the right to have it rectified.
3. Compliance with these rules shall be subject to control by an independent authority.

The General Data Protection Regulation (GDPR), Regulation (EU) 2016/679, regulates the protection of natural persons with regard to the processing of personal data and on the free movement of such data. Article 10 of the GDPR regulates the processing of personal data relating to criminal convictions and offences:

> ***"Processing of personal data relating to criminal convictions and offences or related security measures based on Article 6(1) shall be carried out only under the control of official authority or when the processing is authorised by Union or Member State law providing for appropriate safeguards for the rights and freedoms of data subjects. Any comprehensive register of criminal convictions shall be kept only under the control of official authority."***

To find out more…

International initiatives and strategies

- UN Statistical Commission, Forty-fourth session, 26 February-1 March 2013: Report of the National Institute of Statistics and Geography of Mexico and the United Nations Office on Drugs and Crime on a road map to improve the quality and availability of crime statistics at the national and international levels (E/CN.3/2013/11)
- UN Statistical Commission, Fiftieth session, 5-8 March 2019: Report of the United Nations Office on Drugs and Crime on crime and criminal justice statistics (E/CN.3/2019/19)
- Fourteenth United Nations Congress on Crime Prevention and Criminal Justice, 20–27 April 2020: Comprehensive strategies for crime prevention towards social and economic development (A/CONF.234/4)
- United Nations General Assembly, Fifty-fifth session: United Nations Convention against Transnational Organized Crime (A/RES/55/25)
- United Nations Office on Drugs and Crime (UNODC): Crime and criminal justice statistics
- United Nations Office on Drugs and Crime (UNODC): Crime prevention
- Charter of Fundamental Rights of the European Union
- International Criminal Police Organization (INTERPOL)

SDGs and crime and criminal justice statistics

- United Nations Office on Drugs and Crime (UNODC): UNODC and the 2030 Agenda for Sustainable Development
- United Nations Office on Drugs and Crime (UNODC): SDG resources

Systems of criminal justice statistics

- United Nations Office on Drugs and Crime (UNODC): Manual for the Development of a System of Criminal Justice Statistics
- International Classification of Crime for Statistical Purposes (ICCS)
- Criminal Justice Assessment Toolkit (CJAT)
- United Nations Surveys on Crime Trends and the Operations of Criminal Justice Systems (UN-CTS)
- The 2018 United Nations Survey of Crime Trends and Operations of Criminal Justice Systems (2018 UN-CTS)
- UNODC: Manual for the Measurement of Juvenile Justice Indicators
- UNODC: Manual on corruption surveys
- UNODC: Global study on homicide
- UNODC: Global report on trafficking in persons
- UNODC: Global study on smuggling of migrants
- UNODC: World wildlife crime report

Crime victim surveys

- UNODC-UNECE Manual on Victimization Surveys
- International Crime Victims Survey (ICVS)
- Victimisation Surveys in Comparative Perspective by K. Aromaa and M. Heiskanen (HEUNI)
- Wetenschappelijk Onderzoeken Documentatiecentrum (WODC): Criminal Victimisation in International Perspective, Key findings from the 2004-2005 ICVS and EU ICS by J. van Dijk, J. N. van Kesteren and P. Smit

Violence against women

- European Institute for Crime Prevention and Control, affiliated with the United Nations (HEUNI): International Violence Against Women Survey (IVAWS)
- UN Women: Global Database on Violence against Women
- Expert paper on IVAWS by S. Nevala (HEUNI)
- Violence Against Women: An International Perspective by H. Johnson, N. Ollus and S. Nevala, Springer

Prison populations

- World Prison Brief: World Prison Population List (13th edition)

The EU crime and criminal justice statistics

- The Hague programme: strengthening freedom, security and justice in the European Union (2005/C 53/01)
- Commission Communication (COM/2006/0437 final): Developing a comprehensive and coherent EU strategy to measure crime and criminal justice: an EU Action Plan 2006-2010
- The Stockholm Programme: An open and secure Europe serving and protecting citizens
- European Parliament and Council Regulation (EU) 2016/679: Protection of natural persons with regard to the processing of personal data and on the free movement of such data (General Data Protection Regulation)
- Eurostat: Crime and criminal justice
- Eurostat: Methodological manual for the EU survey on gender-based violence against women and other forms of inter-personal violence (EU-GBV) — 2021 edition

- Eurostat: EU survey on gender-based violence against women and other forms of inter-personal violence (EU-GBV) – first results – 2022 edition
- Eurostat: Monitoring EU crime policies using the International Classification of Crime for Statistical Purposes (ICCS)
- Eurostat: EU guidelines for the International Classification of Crime for Statistical Purposes (2017 edition)
- Eurostat: Crime statistics (Statistics explained article)
- Eurostat: SDG 16 - Peace, justice and strong institutions (Statistics explained article)
- European Sourcebook of Crime and Criminal Justice Statistics
- European Union Agency for Fundamental Rights (FRA)
- European Institute for Gender Equality (EIGE)
- European Monitoring Centre for Drugs and Drug Addiction (EMCDDA)
- EUROPOL - European Union Agency for Law Enforcement Cooperation
- European Court on Human Rights: Guide on Article 6 of the European Convention on Human Rights — Right to a fair trial (criminal limb)

Regional initiatives and references

- UNDP Africa: Governance, peace, and security in the Strategy for the Harmonization of Statistics in Africa (GPS-SHaSA)
- UNDP Africa: SHaSA: Governance, peace and security in Burundi, Côte d'Ivoire, Malawi, Mali and Uganda: Comparative survey-based data from NSOs towards the Sustainable Development Goals & African Union Agenda 2063
- UNDP Africa: GPS-SHaSA survey in Burundi (leaflet)
- UNODC and UN HABITAT: Urban crime prevention and safety: Evidence-based policies for improved community safety in Latin American and African cities
- UNODC: Developing standards in justice and home affairs statistics: International and EU acquis — Development of monitoring instruments for judicial and law enforcement institutions in the Western Balkans

Other references

- Criminal Justice Systems in Europe and North America 1995-2004 by K. Aromaa and M. Heiskanen (eds.)
- Towards the Monitoring of Goal 16 of the United Nations' Sustainable Development Goals (SDGs) by Michael Jandl
- Crime and Gender: A Study on how Men and Women are Represented in International Crime Statistics by Markku Heiskanen and Anni Lietonen
- Recording Community Sanctions and Measures and Assessing Attrition - A Methodological Study on Comparative Data in Europe by Markku Heiskanen, Marcelo F. Aebi, Willem van der Brugge and Jörg-Martin Jehle (eds.)
- International Statistics on Crime and Justice by S. Harrendorf, M. Heiskanen, S. Malby (eds.)
- Robertson, C. and Das, D.K. (2008) An Introduction to Comparative Legal Models of Criminal Justice, London: CRC Press

E.12 Living conditions, poverty statistics

E.12. Living conditions, poverty statistics

The chapter in brief

This chapter is intended to provide users with an easy understanding and a proper use of living conditions and poverty statistics.

Since poverty is strongly interrelated with the living conditions of people, the term "poverty" is often used in a broader sense by also embracing living conditions.

What is commonly defined as "poverty" seems to be difficult to conceptualise in an exhaustive way and then to be measured. Indeed, some key questions arise when dealing with the matter. They can be summarised as follows:

- How can one define poverty in a given country or economy? Should this be based mostly or uniquely on monetary measures (e.g., an income threshold) or the equivalent of a basket of goods and services (e.g., a minimal asset to match some basic needs) or multiple factors including income distribution and other measures of people's conditions (e.g., access to health care, education, sanitation)?
- How can one compare different countries or economies? Indeed, this mostly depends on the current conditions of the economies to be compared: how can one compare countries based on the same absolute criterion (or criteria) when their living standards differ widely? This represents a challenge when comparing not only different countries but also different areas in the same country (e.g., rural versus urban areas).

This chapter tries to make readers (more) familiar with these issues in order to allow them using any relevant statistical information. Therefore, it explains why poverty statistics are important, how to define and conceptualise the topic, how to assess and measure it, why living conditions statistics are important especially in a multidimensional approach to poverty, what are the most recent and valuable initiatives on the topic (e.g., research, methodology, databases).

The chapter is structured in five short analytical sections. The first section focuses on the main policy applications of poverty statistics; the second one is dedicated to concepts and definitions, including measures; the third one focuses on data and metadata; the fourth one is dedicated to the main data quality issues, while the final one provides some inputs for the improvement of sector statistics. Some recent and useful examples are explained in boxes. Detailed and updated references are provided in the 'To find out more' box at the end of the chapter, providing hyperlinks to international documents, literature and databases (including to the sources for all examples provided).

E.12.1. Policy applications: what these statistics are used for

Living conditions and poverty statistics are used in a wide range of policy areas. The most important ones are the following:

- **Poverty reduction**. Many national and international projects are designed with the goal to alleviate poverty in a given geographical area. Identifying who the poor are and where they live is essential to target the poorest populations and channel resources to them for better impacts.
- **Project design and piloting**. Knowing poverty characteristics of municipalities in a country provides a statistical base for deciding where to act first or which localities have the best conditions for piloting a poverty reduction project. By conducting poverty surveys, decision makers will have the necessary tools to identify priority issues to address and how to tackle them.
- **Development planning**. Planning for local development is essential for improving living conditions of poor populations. Through poverty statistics, structural information on local populations set the base for planning future initiatives in targeted areas. Survey results on poverty related issues are used for budgeting, setting milestones for the implementation and evaluation of projects in favour of vulnerable populations.
- **Monitoring and evaluation**. With information on the living conditions of targeted populations, poverty statistics are necessary before, during and after a project is implemented. They help to identify areas of improvement in living standards where development projects are active, in comparison to similar places where such projects are not. They are crucial to evaluate how a specific policy impacts on its beneficiaries.

Taking into account the multiple applications for policy makers, one of the key questions arising when dealing with the topic of poverty is the potential presence of any direct link with economic growth. As shown in the example in the following box, economic growth is not always directly and unequivocally linked to improvement of living conditions and reduction of poverty. Indeed, economic growth may be unequal or not homogeneous; in other terms, it may benefit only some regions or zones (e.g., urban zones more than rural ones) or benefit some categories of people more than others (e.g., educated persons more than uneducated ones). One of the risks associated with unequal economic growth is the increase of the disparities or the poverty gap in a given country. This is the reason why – especially in partner countries – development policies aimed at poverty reduction should be better calibrated and targeted on specific people's needs and living situations.

Box E.12.1: Use of poverty statistics for poverty reduction in Ethiopia

'Harnessing continued growth for accelerated poverty reduction 2020' is a recent poverty assessment study for Ethiopia, developed with the contribution and support of the World Bank Group. Based on various national sources (Household Living Standard Surveys, Ethiopia socioeconomic Survey, Demographic and Health Survey), this study sheds light on the impact of the social programs adopted by the national government to reduce poverty in the country. Both monetary and non-monetary dimensions of poverty are monitored over a five-year period between 2010-11 and 2015-2016).

The assessment analyses the impact of economic growth on poverty reduction. Changes in poverty – as measured by the poverty rate based on the national poverty line - and inequality (calculated through the Gini Coefficient) are monitored in both rural and urban areas and put in relation to the economic growth experienced by the country (real GDP growth). Other indicators of people's conditions, such as the welfare of the poorest 20% of the population, are also calculated and monitored.

The study shows how poverty reduction is characterised by many discrepancies. In fact, poverty is highly correlated with the level of education (more uneducated people are poor), the dependency rate (poverty is associated with a higher dependency rate), the gender of the head of household (household headed by women are poorer than those headed by men), the regional dimension (rural areas tend to stay behind urban ones when economic growth accelerates).

The study also highlights the importance of economic growth programs in agriculture – especially in urban areas – to accelerate poverty reduction of households by improving their living conditions (e.g., access to basic needs, access to education and welfare).

Source: World Bank: Ethiopia Poverty Assessment, April 2020

E.12.2. Concepts and definitions

The first step to approach the topic of poverty and living conditions is to understand concepts and definitions. In this case, the key question should be what we define as 'poverty' and 'living conditions', including their mutual relationship. In simple terms, poverty can be defined as a situation of need, fundamentally expressed by people's socio-economic conditions.

This practical simplification can help us define the concept in general terms. However, the most critical issue is: how do we assess people's needs? In the international community, including social scientists, policy makers and planners, it is commonly agreed to assess this phenomenon from two different perspectives:

- Absolute poverty
- Relative poverty

A household is in a situation of absolute (or extreme) poverty when its members lack the basic necessities for survival.

One example in this regard is the international poverty line as agreed by the United Nations with the approval of the Millennium Development Goals (MDGs) in 2000. Initially, this was fixed at 1.00 US$ PPP a day and further increased to 1.25 US$ PPP a day in 2011[1]. In September 2022, the threshold of extreme poverty was agreed at 2.15 US$ PPP a day [2].

Any international poverty line, including the current one (2.15 US$ a day), can measure the proportion of people in absolute or extreme poverty everywhere in the world. Although it is very important to have an absolute criterion to assess poverty, this is not sufficient to compare countries with a different economic standard or regions within a given country with a different development situation (e.g., urban and rural areas). This is the reason why poverty should be assessed also in relative terms; in other words, this should be done based on a specific criterion valid for each specific case study.

Relative poverty is a situation where people's disposable income level - which generally directly influences their standard of living - is too low compared to the general standard of living in the relevant country or region. This describes the status of people struggling to live a normal life and unable to participate in ordinary economic, social and cultural activities. With this definition, relative poverty may vary from country to country, depending on the income level enjoyed by the majority of citizens. While not as extreme as absolute poverty, relative poverty is still very serious and harmful in all countries.

Therefore, we cannot neglect that poverty does affect not only the so-called "poor" countries but also the so-called "rich" ones.

Some examples – as provided in the two following boxes – are useful to understand how poverty is assessed (and measured) in a partner country (Tanzania) and a developed country (The United States), and also how the phenomenon affects the respective national populations differently.

1 PPP = Purchasing Power Parity
2 World Bank: Fact Sheet: An Adjustment to Global Poverty Lines

Box E.12.2: Measuring poverty in a partner country: Tanzania

This example refers to the poverty assessment work supported by the World Bank Group in Tanzania (2020). The primary data refer to the Household Budget Surveys (HBS) 2007, 2012 and 2018, as well as several rounds of National Panel Surveys (NPSs) and Demographic Health Survey (DHS) data. It also combines spatial information from the population census and other sources with HBS data.

Poverty in Tanzania is measured in relation to a national poverty line based on the basic consumption needs of the population. Extreme poverty refers to the proportion of people not able to get food where the minimum nutritional requirements are fixed at 2 200 kilocalories per adult per day.

Accordingly, the poverty line is estimated at TZS 49 320 per adult per month in 2018 as based on all basic needs, and to TZS 33 748 when referring only to food.

Comparisons are made at national and local level over time.

Survey results show a decline in poverty in both food and other basic needs with differences between urban and rural areas. Even though rural areas generally do experience a considerable decline in poverty over time, the gap with urban areas remains quite high.

Source: World Bank, Mainland Tanzania Poverty Assessment, October 2020

Box E.12.3: Measuring poverty in a developed country: the United States

Poverty is measured by the US Census Bureau in terms of money income compared to a threshold (income before taxes and tax credits, excluding capital gains and noncash benefits) and depending on the household composition. People are grouped on the basis of age and household composition as follows:

- Individuals (single):
  - aged less than 65 years
  - aged more than 65 years
- Households with two people, where the householder is aged:
  - aged less than 65 years
  - aged more than 65 years
- Households with more than two people:
  - seven groups: from three people to nine people and more

A monetary threshold for each target is foreseen on a growing scale: the higher the number of people in the household, the higher the poverty threshold is. With regard to the last available year at the time (2019), poverty thresholds ranged from 13,300 US$ for a single under 65 years until 56,895 US$ for a family with nine people and more (with one person aged less than 18 years).

Thresholds are updated on a yearly basis and adjusted for the Consumer Price Index (CPI). Statistics on poverty are available since 1959.

In 2019, more than 33 million people are estimated to be in poverty in the US (a bit more than 10 percent of the total population). 8.5% of all families are in poverty compared to 18.8% of unrelated individuals. About one-fifth of the families headed by a woman (without the presence of the spouse) are in poverty. Black people are poorer than white people regardless of the family composition.

Source: Semega J., Kollar M., Shrider Emily A., and Creamer John F.: Income and Poverty in the United States: 2019, September 2020

E.12.2.1 MEASURING POVERTY THROUGH INCOME AND CONSUMPTION NEEDS

Both approaches to assess poverty, absolute and relative, are based on income and/or consumption assumptions. This can be considered – as a whole – a "***monetary approach***" to poverty.

As such, poverty can assume three different dimensions based on the scope of research:

1. **Poverty** (in the strict sense), when we want to investigate if people have enough resources or ability to meet their daily needs of consumption of goods and services;
2. **Inequality**, when we want to investigate the distribution of income, consumption or/and other attributes across the population;
3. **Vulnerability**, when we want to investigate the probability or risk of being in poverty today – or falling deeper into poverty – in the future.

- **Poverty** (*in the strict sense*). We estimate that individuals fail to meet the definition of well-being. To define a poverty measure we need to know: a) What is the accepted poverty line? and b) Which indicator shall we use to assess the poverty level? From these two notions one could count the number of people living with less than the poverty line, say 2.15 US$ a day or other thresholds (e.g., 3.20 US$ a day or higher). In the context of relative poverty, people could be poor not only because they earn less than the national threshold, but also because they do not have an acceptable standard of living. Relative poverty is sometimes the only way to understand how people with a relatively high level of income – in comparison to other areas – may not be able to live a decent life in their environment. This is the reason why poverty is preferably measured in relative terms. Some recent and valuable initiatives in this regard relate to the work of the OECD with the ***Relative Poverty Rate*** and World Bank with the ***Societal Poverty Line***.
- **Inequality.** Another concept associated with the measure of poverty relates to the inequalities and the distribution of earnings across the whole population. The ***Gini Coefficient*** is an interesting tool for this type of analysis. In the European Union, the preferred indicator for measuring inequality of income distribution is the ***Income Quintile Share Ratio***. Also known as the ***S80/S20***, this is calculated as the ratio of total disposable income received by the 20 % of the population with the highest income (the top quintile) to that received by the 20 % of the population with the lowest income (the bottom quintile).
- **Vulnerability.** The probability (or risk) of being in poverty today or to fall into deeper poverty in the future is known as vulnerability. This plays a key role in the notion of relative poverty. Uncertainty in future income, e.g., inability to cope with severe weather conditions such as droughts, is a basic aspect of vulnerability.

- The ***At-risk-of-poverty rate*** rate is a key indicator of vulnerability adopted by the EU's **Statistics on Income and Living Conditions (EU-SILC)**. In its basic definition, the *"**At-risk-of-poverty rate** is the proportion of persons living in households where equivalised disposable income is below the threshold of 60% of the national equivalised median income"*. The "***Equivalised disposable income** is the total income of a household, after tax and other deductions, that is available for spending or saving, divided by the number of household members converted into equalised adults; household members are equalised or made equivalent by weighting each according to their age, …".*

For vulnerable people, the economic environment becomes a factor of poverty when today's participation in economic activities does not guarantee a decent standard of living conditions in the future. Therefore, there is a need to statistically assess living conditions.

Please note that income and consumption statistics are discussed at length in chapter F.23.

E.12.2.2 MEASURING LIVING CONDITIONS

Living conditions consider any need (e.g., food, education, health, leisure) that can impact on people's lives. Obviously, needs differ from country to country and tend to change over time. Nevertheless, they are to be considered and assessed in order to provide a broader picture of people's social situation, beyond the one normally expressed by the traditional measures of income and consumption.

Living conditions strongly affect the capacity of people to be socially included or excluded: if someone lacks basic goods and/or services - such as adequate food, basic health cares, access to school - risks to be excluded or to feel excluded from his/her society. This is the reason why living conditions should be analysed in strict conjunction with the social inclusion/exclusion phenomena.

The European Union has adopted some key indicators to measure social inclusion/exclusion:

Material Deprivation expresses the inability to afford a fixed consumption basket of items, considered by most people to be desirable or even necessary to live an adequate life. The indicator distinguishes between individuals who cannot afford a certain good or service, and those who do not have this good or service for another reason, e.g., because they do not want or do not need it.

Material Deprivation Rate provides a headcount of the number of people who cannot afford to pay for specific items. In the EU, the deprivation indicator is based on 13 items. Seven deprivation items relate to the person's household and six to the persons themselves. The seven household deprivations consist of six items i.e., the inability for the household to:

- face unexpected expenses;
- afford one week's annual holiday away from home;
- avoid arrears (in mortgage, rent, utility bills and/or hire purchase instalments);
- afford a meal with meat, chicken or fish or vegetarian equivalent every second day;
- afford keeping their home adequately warm;
- have access to a car/van for personal use;
- replace worn-out furniture.

The six personal deprivations are the inability for the person to:

- replace worn-out clothes with some new ones;
- have two pairs of properly fitting shoes;
- spend a small amount of money each week on him/ herself ("pocket money");
- have regular leisure activities;
- get together with friends/family for a drink/meal at least once a month; and
- have an internet connection

A person is considered severely deprived if the person is afflicted by enforced lack of 7 or more items out of 13.

Another indicator of living conditions is the share of persons living in a household with low work intensity. The **Work Intensity** of a household is the ratio between the number of months that all working age household members have been working during the income reference year and the total number of months that could theoretically have been worked by the same household members. The indicator **Persons living in households with low work intensity** is the number of persons living in households with a work intensity below a threshold set at 0.20. In other words, those active people (of working age) who work 20% or less than of the potential annual working time in a year.

E.12.2.3 MEASURING POVERTY IN A MULTIDIMENSIONAL WAY

In recent years, the research on poverty has produced some innovative measurement approaches going beyond the traditional income and consumption criteria. The concepts of living conditions and the associate ones of social inclusion / exclusion have been further investigated, developed and integrated in a multidimensional perspective.

A valuable and leading contribution is provided by the **Oxford Poverty and Human Development Initiative (OPHI)**: the **Multidimensional Poverty Index (MPI)**. This is currently published also by the UNDP. This is currently published also by the UNDP. The MPI is a complementary measure of poverty, focusing on three dimensions that characterise the life of people:

1. Health;
2. Education;
3. Living standards.

The first dimension, 'Health', is articulated in two components: Nutrition and Child Mortality. 'Education' includes two components: Years of Schooling and School Attendance. The third one ('Living Standards') is articulated in six components:

Cooking Fuel; Sanitation; Drinking Water; Electricity; Housing; and Assets. The MPI is calculated on the basis of 10 indicators, one for each of these components. The indicators are in line with the indicators of the respective SDGs. The components of 'Health' and 'Education' are each weighted by 1/6, while each of the six components of 'Living Standards' are weighted by 1/18 in the MPI.

A person is considered as deprived if at least one-third of the ten indicators are below the related cut-offs (i.e., the border lines between poor and non-poor, as suitably identified). MPI can be compared across regions and countries as well as within countries at different levels.

MPI represents an innovative and more comprehensive measurement of poverty. It cannot be monitored separately from other traditional "monetary" tools but should be strictly linked to them.

The OPHI-UNDP Global Multidimensional Poverty Index monitors poverty based on the international headcount ratio for extreme poverty and the MPI based on its dimensions/components[3] .

E.12.3. Sources of data and metadata

There are a number of widely used and well-reputed international sources of data and metadata on living conditions and poverty statistics. We can split them in two categories: worldwide and regionally based.

A. International sources (worldwide coverage)

One of the most important worldwide platforms on poverty and living conditions statistics is the Poverty and Inequality Platform developed and managed by the World Bank Group. This platform provides users with accurate and updated statistics on poverty, shared prosperity and inequality by country, region and category (e.g., Income Level: Low, Lower Middle, Upper Middle). The leading indicator is the Global Headcount Ratio, the internationally agreed poverty line fixed since September 2022 at 2.15 US$ PPP a day. Data for other commonly used poverty lines are also provided (3.65 US$ PPP and 6.85 US$ PPP a day). Time series are available from the early 1980s onwards[4].

The World Bank has also elaborated an interactive poverty calculator (accessible from the Poverty and Inequality Platform). The tool allows users to calculate and extract poverty statistics from the basic data provided by the platform, including calculating and grouping the poverty estimates for 166 economies across the world. It also provides a very useful methodological section where poverty and inequality statistics are clearly explained. The database is updated on a continuous basis (several times a year).

3 Based on the results for 2020 covering 107 countries, about 1.3 billion people (corresponding to 22.3% of the total) lived in multidimensional poverty. The majority of people in multidimensional poverty (84.3%) lived in Africa and Asia. Trends in multidimensional poverty seemed to be not fully associated with the dynamics in monetary poverty. The Covid-19 pandemic seemed to have a serious negative impact on the reduction of poverty and especially the multidimensional poverty, notably in the poorest countries.

4 The Global Poverty Headcount Ratio at 2.15 US$ PPP a day has passed from 37.9% in 1990 to 8.5% in 2019. The number of persons living with less than 2.15 US$ PPP a day has passed from 2.01 billion in 1990 to 659 million in 2019 (World Bank, Poverty and Inequality Platform, last access: August 2023).

Another important database managed by the World Bank Group is the ***World Development Indicators (WDI)***. This represents the leading database of the World Bank, providing a number of development statistics, including indicators on poverty, living conditions and income distribution.

The main source of basic data on poverty and living conditions elaborated by the World Bank is national household surveys. Metadata for each country are also described in a user-friendly way.

Another important provider of worldwide data on poverty and living conditions is the **United Nations** system. The **United Nations Statistics Division (UNSD)** provides the ***Sustainable Development Goals (SDGs) Database***, covering all indicators under Sustainable Development Goals and specific targets. The most relevant goals for the follow-up of poverty issues around the world are:

- **Sustainable Development Goal 1: End poverty in all its forms everywhere**
- **Sustainable Development Goal 10: Reduce inequality within and among countries**

Each SDG is specified and monitored by targets (e.g., "***Target 1.1: By 2030, eradicate extreme poverty for all people everywhere"***) and related indicators (e.g., "***Indicator 1.1.1: Proportion of population below the international poverty line, by sex, age, employment status and geographical location (urban/rural)"***. The SDGs database is updated on a continuous basis and also contains a detailed metadata section, including institutional information, concepts and definitions, methodology, data sources, data availability, calendar, and data providers.

Within the UN system, the ***World Income Inequality Database (WIID)*** of the United Nations University – World Institute for Development Economics Research (UNU-WIDER) provides detailed and updated data on income inequality (e.g., Gini, median, mean) for all countries worldwide.

The **International Labour Organization (ILO)** also provides some relevant databases at worldwide level: the ***Working Poor*** database covers employed people living in households under the internationally agreed poverty lines, and the ***Labour Income and Inequality*** database refers to labour income in PPP by decile.

In the light of the new initiatives in the field of poverty statistics, a valuable source for poverty data is the **Global Multidimensional Poverty Index (MPI) Databank**, developed and managed by the **Oxford Policy and Human Development Initiatives (OPHI)**. MPI data are available at country level, sub-national level and rural/urban area.

B. International sources (regional coverage)

Other international organisations provide some relevant data on poverty-related issues such as income and inequality with a specific focus on their member countries.

At the European level, two surveys are recommended to users of poverty and living conditions statistics the ***European Union Statistics on Income and Living Conditions (EU-SILC)*** and the ***European Social Survey (ESS)***.

The ***European Union Statistics on Income and Living Conditions (EU-SILC)*** is the leading source of data on income, social inclusion and living conditions within the Europe 2020 Strategy. Data are collected for key topics of poverty and social inclusion. The EU-SILC data are available for the EU-27 and all EU Member States, and also include EFTA countries (Iceland, Norway, Switzerland), and – where available – some EU candidate countries (Montenegro, North Macedonia, Serbia, Türkiye). Data are provided in both a cross-sectional and a longitudinal perspective. Some topics are covered at household level (Social exclusion and Housing conditions), while other topics (Labour, Income, Education and Health) are collected at individual level (people aged 16 years and over). Data – freely downloadable from the Eurostat's website – are also supported by a broad methodological section.

The ***European Social Survey (ESS)*** is elaborated and managed by the **European Social Survey – European Research Infrastructure Consortium (ESS-ERIC)**. The ***ESS*** is carried out every two years every two years since 2002. The ESS covers a wide range of European countries (30 in the 2018 round), with the purpose of analysing various social themes: from media and social trust to subjective well-being, via gender, immigration, justice, democracy and many others. Some topics are monitored on a continuous basis (Subjective well-being, Gender, Household) while other topics are monitored on a rotation basis (e.g., Family work and wellbeing, Personal well-being). The core module on "Subjective well-being", with its insights on measuring social exclusion, is particularly interesting. Data are regularly updated, and can be easily downloaded in SAS, SPSS and STATA format. A broad methodological guide is also available on the website, including the core questionnaires. The exercise initiated in 2020 contained an innovative module focused on COVID-19.

The ***Income Distribution Database*** of the **Organization for Economic Co-operation and Development (OECD**) provides data on the Gini index, income share ratio (top 20% vs. bottom 20% and relative income poverty) for its member countries. The database is updated on a yearly basis and data are freely downloadable from the OECD website. As regards its EU member countries, this database makes a wide use of the EU-SILC data.

Detailed references and related links are provided in the 'To find out more' box at the end of this chapter.

E.12.4. Analysing data quality and identifying problems

This section is intended to briefly illustrate the main quality issues and problems linked to living conditions and poverty statistics. More specific information on data quality and solutions can be found in section C.6.3 in this guide and some international sources provided at the end of this section.

The key issues linked to the use of surveys are sampling and non-sampling errors. The potential for statistical errors in poverty and living conditions data affects comparability across countries and over time. In-depth assessment of data quality will lead to better statistics in such surveys. More importantly, this will allow for better policy formulation, in favour of beneficiaries of projects designed to improve the living conditions of people.

Measures of data quality are important for the evaluation and improvement of survey design and procedures. The respondents' trust in the confidentiality of information provided, as well as a continuous monitoring and improvement of the data quality of household surveys, is particularly important.

The main survey errors encountered in poverty statistics concern direct measure and estimation errors:

- **Direct measure errors** arise from the fact that what is measured on the units included in the survey can depart from the actual (true) values for those units. These errors concern the accuracy of measurement at the level of individual units enumerated in the survey, and focus on substantive content of the survey: definition of the survey objectives and questions; ability and willingness of the respondent to provide the information sought; the quality of data collection, recording and processing. This group of errors can be investigated in relation to various stages of the survey operation.
- **Estimation errors** occur in the process of extrapolation from the particular units enumerated in the survey to the entire study population for which estimates or inferences are required. They originate from sample design and implementation, and include errors of coverage, sample selection and implementation, non-response, and also sampling errors and estimation bias.

For more information on the quality issues relating to survey data, please refer to the work of the United Nations Statistics Division (UNSD).

Some broad and effective examples on the use of survey data are provided by the EU survey on income and living conditions (EU-SILC), as well as the European Social Survey (ESS).

E.12.5. Improving living conditions and poverty statistics

There is continuous work on improving living conditions and poverty statistics at international level. Most of the technical and policy initiatives in this regard are organised under the umbrella of the United Nations in cooperation with other international agencies directly involved (e.g., World Bank), organisations, countries and partners. Eurostat is also widely committed to provide continuous and valuable improvements in this sector[5].

At the EU level, it is worth noting the work on the flash estimates produced by **Eurostat**. **Flash estimates** are intended to complement the EU-SILC data in order to have some preliminary data for technical discussion and presentation. This work – based on original econometric techniques of estimation - relates to some key indicators such as **at-risk-of-poverty rate** and the **income quintile share ratio** or S80/S20 ratio. Flash estimates for 2022 are already available in June 2023.

An important international initiative aimed at improving poverty and living conditions statistics is the **Network of Experts on Poverty Statistics** under the umbrella of the **United Nations Statistical Commission for Europe (UNECE)**. The Network is called to improve poverty statistics, including concepts, measures, methodologies and survey tools. Among the most recent contributions arising from the **Expert Meeting on Measuring Poverty and Inequality** (Vienna, 2018), important inputs relate to the need to identify and follow-up the poverty indicators of the 2030 Agenda for Sustainable Development, the improvement of response rates and sample precision in surveys, the focus on asset-based quality and inequality, the need of inclusion of social transfers in kind, housing wealth and rent in poverty measurement, the coverage of marginalised and disadvantaged population groups, and some new issues such as the measurement of poverty at the individual and subjective level.

At the level of policy inputs, the report of the UN Secretary-General on the policy decisions of the **United Nations General Assembly and the Economic and Social Council** of 20 December 2019 highlights the work of the UN Statistical Commission. As regards the chapter **"Poverty Statistics"**, the UN General Assembly, in line with the follow-up of the SDGs, has stressed the need to reinforce the statistical capacities and the monitoring systems at the national level in order "to ensure access to data which are of high quality, accessible, timely, reliable and disaggregated by income, sex, age, race, ethnicity, migration status, disability and geographic location (…)" as well as the importance of the use of multidimensional measures of poverty.

In the same document, the commitment agreed during the workshop of the **Data For Now Initiative (Data4Now)** held in Kigali on 13-14 November 2019 "on a roadmap to increase the use of robust methods and tools that improve the timeliness, coverage, and quality of poverty estimates between survey rounds, focusing on small-area poverty and income estimates" is recalled [6].

The United Nations is also committed to provide technical and methodological tools in the field of poverty measurement. The most recent work is the **Guide on Poverty Measurement (2017)** elaborated by the **United Nations Economic Commission for Europe (UNECE)**. This represents a very useful tool for various users and practitioners of poverty statistics (see following box).

Box E.12.4: UNECE Guide on Poverty Measurement (2017)

The **UNECE Guide on Poverty Measurement (2017)** explains in a clear and user-friendly way how poverty is (and can be) measured at the international level. The guide is supported by a simple language, the use of charts and synopses, a number of practical examples, as well as empirical data and related sources.

It provides a broad conceptual frame for poverty, inequality and social exclusion statistics, including updates on the evolution of the methodology to measure poverty: from unidimensional to multidimensional approaches.

All concepts, from monetary poverty to material deprivation, are supported by full methodological explanations, including metadata (e.g., statistical units, population coverage), use of data collection tools (surveys), and data disaggregation.

The analysis starts from the **monetary poverty** measures (both absolute and relative) as based on income and consumption. Poverty measures are described in a both static (e.g., headcount ratio, poverty gap) and dynamic view (persistent poverty, entry-exit rates). Summary recommendations, including data and metadata, are also provided.

The approach to material deprivation is effectively explained as well. It also includes the EU contributions in the matter (EU-SILC), the MDGs/SDGs dashboards, and other international initiatives in the same field.

A wide section is dedicated to the **multi-dimensional approach** to poverty, like the OPHI-UNDP methodology, including multiple deprivation dimensions (e.g., undernourishment, lack of drinking water, children out of school).

Finally, some challenges for the future are described, including the need to broaden and extend the analysis to other inclusion/exclusion indicators (e.g., wealth) and approaches (subjective poverty).

The guide further provides - in annex - a brief assessment of the SDGs poverty-related indicators and the summary results of the UNECE survey on poverty measurement (2014).

Source: United Nations Economic Commission for Europe (UNECE), *Guide on Poverty Measurement*, 2017

5 Given the scope and the limited space of this chapter, we can focus on some initiatives in this regard and invite readers to consult references in the final section for more details.

6 Workshop organized by UNSD with World Bank and other partners, including the Global Partnership for Sustainable Development Data and the Sustainable Development Solutions Network.

To find out more…

Methodology

- Eurostat: Income inequality and poverty indicators (experimental statistics)
- Eurostat: Flash estimates of income inequalities and poverty indicators (experimental statistics), October 2020
- Eurostat: Income and living conditions – Methodology
- Eurostat: EU statistics on income and living conditions (EU-SILC) methodology – Europe 2020 target on poverty and social exclusion
- Eurostat: At-risk-of-poverty rate; Equivalised Disposable Income; Material Deprivation; Persons living in households with low work intensity; At risk of poverty or social exclusion (AROPE)
- European Social Survey - European Research Infrastructure Consortium (ESS--ERIC): Survey Specification (2020)
- European Social Survey - European Research Infrastructure Consortium (ESS--ERIC): ESS Covid-19 Module – Final Module for ESS 2020 (2020)
- Guio A.C., Gordon D., Najera H., and Pomati M.: Revising the EU material deprivation variables, Eurostat Working Papers (2017)
- Oxford Policy and Human Development Initiatives (OPHI) and UNDP: Global Multidimensional Poverty Index (MPI). Charting pathways out of multidimensional poverty: achieving the SDGs 2020
- Oxford Policy and Human Development Initiatives (OPHI) and UNDP: Global MPI report 2023: Unstacking Global Poverty – Data for High Impact Action
- OECD: Poverty Rate
- United Nations – Economic Commission for Latin America and Caribbean (ECLAC): Income Poverty Measurement. Updated methodology and results (2019)
- United Nations Economic Commission for Europe (UNECE): Harmonised Survey Module for Poverty Measurement (2019)
- United Nations Economic Commission for Europe (UNECE): Guide on Poverty Measurement (2017)
- United Nations Statistics Division (UNSD): Designing Household Survey Samples: Practical Guidelines (2005)
- World Bank: Measuring Poverty
- World Bank: Reversals of fortune. Poverty and Shared Prosperity 2020 (2020)
- World Bank: Societal Poverty: a global measure of relative poverty

International initiatives on poverty and social exclusion

- Balestra C. and Tonkin R.: Inequalities in households wealth across OECD countries: Evidence from the OECD Wealth Distribution Database, OECD Statistics Working Papers 2018/01 (2018)
- EAPN: European Anti-Poverty Network
- Eurostat: Income and Living Conditions statistics
- IFAD: Delivering results that change lives
- IFAD: Developing Effectiveness
- Oxford Policy and Human Development Initiatives: Global MPI Country Briefings
- United Nations Economic and Social Council: Policy Decisions of the General Assembly and Economic and Social Council that are relevant to the work of the Statistical Commission (2019)
- United Nations Economic Commission for Europe: Expert Meeting on Measuring Poverty and Inequality, Vienna 29-30 November 2018
- United Nations Economic Commission for Europe: Measuring Subjective Poverty: an OECD Perspective (2018)
- United Nations Statistical Commission and Economic Commission for Europe: In-depth Review of Poverty Statistics (2012)
- World Bank: Poverty and Equity Briefs

Data sources

- Eurostat: European Union Statistics on Income and Living Conditions (EU-SILC) - Database
- Eurostat: Persons at risk of poverty and social exclusion
- ESS-ERIC: European Social Survey – Round 9 (2018)
- ILO: Statistics on working poverty
- ILO: Statistics on labour income and inequality
- OECD: OECD Income (IDD) and Wealth (WDD) Distribution Databases
- OECD: Society at a Glance 2019. OECD Social Indicators
- Oxford Policy and Human Development Initiatives: Global MPI Databank
- United Nations: Sustainable Development Indicators Database
- United Nations University (UNU-WIDER): World Income Inequality Database - WIID
- World Bank: Poverty and Inequality Platform
- World Bank: Poverty and Inequality Platform: poverty calculator
- World Bank: Open Data Initiative
- World Bank: World Development Indicators (WDI)

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Poverty maps

- Hyman, Glenn G., Larrea C., and Farrow, A.: Poverty mapping case studies Harvard Dataverse (2020)
- Our World in Data: Poverty
- World Bank: Poverty headcount ratio at $2.15 a day (2017 PPP) (% of population); Poverty headcount ratio at national poverty lines (% of population); Gini Index

Recent and current research documents on measuring poverty

- Alkire S., Kanafaratnam U., and Suppa, N.: The Global Multidimensional Poverty Index (MPI) 2020, OPHI MPI Methodological Note 49, Oxford Policy and Human Development Initiative (2020)
- Semega J., Kollar M., Shrider Emily A., and Creamer John F.: Income and Poverty in the United States: 2019, United States Census Bureau (Census.Gov) (2020)
- United Nations University (UNU-WIDER): Estimates of the impact of Covid-19 on global poverty, WIDER Working Paper 2020/43 (2020)
- Vogel J., Boelhouwer J. and Veenhoven R.: Measuring social exclusion for the ESS core module (2018)
- World Bank: Macro-Poverty Outlook for Sub-Saharan Africa (2020)
- World Bank: Open Knowledge Repository: Poverty Assessment
- World Bank: Tanzania Mainland Poverty Assessment (2020)
- World Bank: Ethiopia Poverty Assessment (2020)
- World Bank: Living Standard Measurement Studies (LSMS)-supported high-frequency phone surveys on COVID-19

UN documents and reports on Sustainable Development Goals (SDGs)

- United Nations: Transforming our world: the 2030 Agenda for Sustainable Development
- United Nations: Sustainable Development Goals - Goal 1: End poverty in all its forms everywhere
- United Nations: Sustainable Development Goals - Goal 10: Reduce inequality within and among countries
- United Nations: Sustainable Development Goals Report 2022
- United Nations: Sustainable Development Outlook 2021

E.13 Population and migration statistics

E.13. Population and migration statistics

The chapter in brief

This chapter covers population and migration statistics. The main challenge is to make comprehensive statistics on vital events, demography, migration and other sectors, in particular in relation to data harmonisation. The data are used to prepare indicators in policy areas covered by the Sustainable Development Goals, the European Consensus on Development as well as several other frameworks worldwide, in particular in Africa by the UNECA.

The chapter starts by identifying the main policy areas for which these statistics are used. It continues by providing a user's view of the statistics involved, first generally considering the concepts, definitions and international requirements for statistics, then entering into a brief review of the relevant data sources and data collection methods. The chapter considers the two broad sectors of demography and migration. Among others, references to refugee statistics and Internally Displaced Persons (IDPs) statistics are introduced, based on the coordination and development on these topics at global level under the so-called EGRISS initiative.

The chapter presents several examples of national practices, including the population census in Palestine and population projections in Morocco, the EU contribution to migration statistics in Africa under the Pan-African Statistics Programme and the best practices of Somalia on IDP statistics. Among the other boxes, the improvement of the civil registration and vital statistics in Africa is described. In addition, the main concepts and definitions on international migration statistics available from the UN recommendations of 1998 are presented, although possible changes may result from the ongoing revision of these recommendations.

Finally, the chapter concludes by discussing how to analyse the quality of the statistics and to identify problems in most of the involved sectors, and provides pointers to mounting effective projects in key areas. The analysis of the situation also details how support by the international organisations, methodological developments and increasing sharing of good practices may lead to significant changes in terms of identification of problems and improvement of statistical quality. On the other hand, the improvement of sector statistics may be direct, i.e., linked to the statistical production, or functional or operational, for instance with respect to the reduction of costs of data collection or better dissemination of data of the population census.

E.13.1. Policy applications: what these statistics are used for

Population statistics and demography – the analysis of the population statistics - lie at the base of public or official statistics. Everyday comparisons between countries and over time are often made by dividing economic and social indicators by the total population. Population data are also used to ensure an equitable regional and local allocation of government funds. In addition, population statistics are in most democracies used to apportion electoral areas[1].

More importantly, population statistics are used for planning, monitoring and evaluating public programmes in most social and economic fields. Other policy uses of population statistics include mainly the following:

- Analysis of the ageing of the population and its effects on sustainability and welfare;
- Evaluation of fertility as a background for family policies;
- Evaluation of the economic impact of demographic change;
- Development and monitoring of immigration and asylum policies.

In major emergencies, population data helps planning rescue operations. The Introduction to this Guide poses the question:

> *"If you think that statistics are important but bread is more urgent, please ask yourself on what information you base your answers to these questions: 'How much bread?' and 'Where is it needed?'"*

Population statistics can provide some of these answers.

Statistics on births and deaths are used to analyse fertility and mortality and so to estimate the future size and structure of a population (population projections). These 'vital statistics' are also used for some in-depth investigations, as in the case of deaths by cause. The data informs analysis of the health status of a population and provides the basis for epidemiological studies.

Population projections are also used to address long-term concerns. These include climate change and global and regional population pressures on resources, such as water and energy supplies. Food policies can also be informed by regional, national and global population projections. In the case of migration statistics, the policy use is of a different nature, ranging from the emergency of rescuing migrants to measures to assist nationals living abroad. Concerning this field, an important current push to improvement and comparability of national data comes from the Global Compact for Safe, Orderly and Regular Migration (GCM) of 2018, with its first objective to collect and use accurate and disaggregated data as a basis for evidence-based policies. In addition, asylum and managed migration statistics on asylum seekers and residence permits, as well as data on migrant integration, provide decision makers with the necessary information for monitoring migration policies.

For all of these fields, the last years have seen a global development in methodological considerations and statistical production with respect to the '2030 Agenda for Sustainable Development' and the 17 Sustainable Development Goals (SDGs). The SDG monitoring framework comprises 231 indicators, informing the different SDGs and providing for disaggregation of data according to these. (It should be noted that some indicators inform on more than one Goal.)

Although the policy needs are different in their details, the demand for population and migration data is overall remarkably similar between developed and partner countries.

1 See for example: Article one of the United States Constitution (Wikipedia page) and Circonscriptions législatives françaises (Wikipedia page).

However, developed countries have easier ways to collect accurate data than partner countries. Furthermore, some countries pay attention to specific events occurring only locally, such as internal displacements due to civil wars or natural disasters.

The private sector increasingly uses demographic data to analyse consumer trends, while political parties and interest groups use the information to analyse public opinion. These activities are increasing in partner countries, especially in middle-income countries.

E.13.2. Concepts, definitions and international requirements

E.13.2.1 OVERVIEW

This chapter covers population and demographic statistics. This includes demography; vital statistics; population structures and growth; population census; demographic projections; families and households (marriages, divorces and household size); population density; urbanisation; and ethnic and cultural identities. Other subjects covered include migration, refugees, asylum seekers and Internally Displaced Persons (IDPs).

Two main sets of statistics are needed to answer common policy questions:

- the numbers, age, sex, location and other characteristics of the population;
- the changes in the population: the numbers of births and deaths (vital statistics) and the numbers of people entering and leaving a country or region, migrants in particular.

However, many other measurements allow answering the many other policy questions arising in the current society and different contexts, from the local to global level.

Population and demographic data come from a number of sources:

- population censuses;
- population registers;
- civil registration;
- other administrative records;
- social and demographic surveys.

This chapter first reviews the relevant sources. Subsequently, it concentrates on the two broad sectors defined as demography and migration. Demography is the statistical study of human populations. It includes long-term projections of the structures of local, national and global populations. In most areas of statistics, statistical institutes carry out only very short-term projections. For migration, the reference is in general to international and internal migration as well as displacement. International protection is also part of this.

E.13.2.2 DATA SOURCES

In most countries, using a **population census** to ccount the number of people present or resident is still a main method of collecting population statistics. It is the main or only data source in many partner countries. The census gives information about the numbers of people, their gender, age, location and other characteristics. In addition, it provides the sample frame from which representative samples of the population are drawn for surveys. Surveys permit more frequent and detailed statistical analyses at lower cost than census questions. The description of the people in the population census provides the information used in setting up the sample frame.

Correct response to the census is a legal requirement, in order for the population to be described accurately. Censuses may include questions about relationships, education, citizenship, previous residence, place of birth, ethnicity, language use and religion. Especially sensitive census questions may in certain circumstances be non-mandatory. An important limiting factor is that each extra question increases the census cost.

The population census is the statistical operation most likely to be challenged politically, whether rightly or wrongly. It is therefore essential that the census is undertaken in a manner that is correct, coherent and transparent.

Population censuses worldwide still mainly consist of traditional enumeration, with interviews of the respondents by enumerators. However, in the last decades a series of new methods ranging from the register-based census to the rolling census have been introduced in most developed countries, with the main objectives to undertake the operation easier, to reduce the burden on respondents and to reduce the costs of conducting the census.

Box E.13.1: The implementation of the 2017 Census of Palestine

The Palestinian Central Bureau of Statistics (PCBS) undertook the last Population, Housing and Establishment Census of the State of Palestine in December 2017. This operation, which covered the territories of West Bank and Gaza Strip, and the enumeration by interviews took into consideration most of the relevant international standards and United Nations principles and recommendations for the 2020 Census Round. The census adopted a paperless method for data collection, with extensive use of Geographic Information System (GIS) tools and tablet devices, integrated in an electronic system composed of several computer applications organised in a relational database.

PCBS outsourced the implementation of the integrated electronic system to a private company. The company developed four main applications covering the census phases of map updating, demarcation of Enumeration Areas (EAs), household listing and building numbering, and the enumeration. Additional applications were developed for conducting the Post Enumeration Survey, for managing the census staff and materials, and for reporting. As a result, PCBS succeeded in both synchronising on a daily basis the data collected in the field with a central database and supervising the field operations in real time. It was the first time that PCBS made extensive use of GIS and mobile technology in such a large statistical operation. This allowed an improvement of the census coverage and data quality and a faster release of census results – by three months for preliminary results and six for the final ones.

The census data dissemination also included the preparation of census reports at national and governorate levels, a web-based interactive census atlas at governorate and locality levels and thematic maps.

A few months after the data collection, the census benefited from technical assistance on behalf of the United Nations, advising PCBS on improvements of the census geodatabase, on how to strengthen capacity of the staff composing the Cartography and GIS Department of PCBS, on the dissemination plan and on other GIS-related activities, also in view of an extended use of administrative data in a medium- to long-term perspective.

Source: Implementation of Geographical Information Sciences in the State of Palestine 2017 Census. Technical Evaluation, Final Report of the Mission to PCBS, United Nations Statistics Division

International recommendations for conducting censuses exist for the purpose of international comparisons. A web portal has been set up for the 'World Population and Housing Census Programme' to assist countries in sharing knowledge and information on census taking. This website also contains a 'Census Knowledge Base' which provides guidance to countries. The global action plans for statistics discussed in section B.1.3.3 provided support to the last census rounds, in particular towards:

- Developing an overall strategy for funding and conducting censuses in low-income countries;
- Researching methods to estimate population regularly;
- Assisting National Statistical Offices (NSOs) in census advocacy;
- Building national technical and management capacity.

The 'World Population and Housing Census Programme' website presents the outcome of many of the successive actions.

A **vital statistics system** is defined as the process of:

(a) collecting information by civil registration or enumeration on the frequency of occurrence of vital events, as well as relevant characteristics of the events themselves and of the person or persons concerned, and

(b) compiling, processing, analysing, evaluating, presenting and disseminating these data in statistical form.

The vital events of interest are: live births, adoptions, legitimations, recognitions; deaths and foetal deaths; and marriages, divorces, separations and annulments of marriage.

Civil registration is defined by the United Nations Statistics Division as:

> *'... the continuous, permanent, compulsory and universal recording of the occurrence and characteristics of vital events pertaining to the population …. Civil registration is carried out primarily for the purpose of establishing the legal documents provided by the law. These records are also a main source of vital statistics. Complete coverage, accuracy and timeliness of civil registration are essential for quality vital statistics.*
>
> *A civil registration system refers to all institutional, legal, technical settings needed to perform the civil registration functions in a technical, sound, coordinated, and standardized manner throughout the country, taking into account cultural and social circumstances particular to the country.'*

The core document for vital statistics and civil registration is the United Nations Statistics Division (UNSD) publication 'Principles and recommendations for a vital statistics system, Revision 3'. According to these principles, civil registration is a major foundation for a legal system for establishing the rights and privileges of individuals in a country. Where it is comprehensively maintained, it is the main source of vital statistics.

A **population register** records information, drawn from civil registers, about each member of the resident population. The population register can provide timely information about the size and characteristics of the population. In some regions, e.g., in Scandinavia, population registers are accurate enough to be used to replace the population census.

Although civil and population registers can be held on computers, few if any low-income countries manage to maintain accurate records. Citizens may not comply with or even be aware of their obligation to register births and deaths. Registration is often impractical, especially for those who live in rural areas.

Box E.13.2: Improving the civil registration and vital statistics in Africa

In 2010, improving civil registration and vital statistics became a continental priority for statistics in Africa. Political support was given to the development and implementation of practical solutions through the United Nations Economic Commission for Africa (UNECA).

A workshop on civil registration and vital statistics took place in Tanzania in 2009. In August 2010, the 'First Conference of African Ministers Responsible for Civil Registration' was convened. The ministers agreed that a functional civil registration system is the basis for building modern legal and public administration systems. It is the first step in collecting reliable vital statistics that are necessary for evidence-based policies for national development. Vital statistics compiled from civil registration systems are the building blocks to establish sustainable demographic and health statistics databases. The resulting information can be used to measure and monitor development results, including the Sustainable Development Goals (SDGs). Civil registration and vital statistics information are needed to implement the 'Reference Regional Strategic Framework for Statistical Capacity Building in Africa' and the global action plans for statistics.

At the '6th Africa Symposium on Statistical Development' in November 2010, the National Statistical Offices of African States resolved to strengthen national Civil Registration and Vital Statistics (CRVS) systems over the five years beginning in 2012. The Africa Centre for Statistics started supporting its. The Africa Programme on Accelerated Improvement of Civil Registration and Vital Statistics (APAI-CRVS) has helped building significant momentum towards that improvement. The political commitment at national level coupled with regional technical and capacity-developing support for countries has brought a paradigm shift from a fragmented and ad hoc approach to a more holistic and integrated improvement of CRVS systems. More than half of the countries have conducted assessments, some have developed strategic plans and a number of them have begun implementing their improvement plans. Despite the remarkable progress achieved in the past few years, there remain a number of major challenges facing the African CRVS systems.

Alternative data sources can be added to a vital statistics system. These include questions on fertility, mortality and migration in population censuses or household sample surveys. Other sources are vital records from sample registration and health records. In some countries, indirect techniques of demographic estimation have been applied to these data sources. The resulting statistical indicators are used for planning purposes, mainly at the national level.

E.13.2.3 DEMOGRAPHY

Demography covers the compilation, analysis and publication of statistics on issues such as:

- Population size, composition and projections;
- The location of the population: urbanization and population density;
- Births, deaths, marriages and divorces;
- Household characteristics and housing;
- Ethnic, language, religious and cultural characteristics of the population;
- Migration and related phenomena.

Key indicators include:

- Total fertility rate;
- Life expectancy at birth;
- Age-dependency ratios;
- Crude rates of births and deaths;
- Rates of population growth or decline.

The data sources for the size, composition and characteristics of the population have been outlined in the previous sections. We now look at the purpose and methods of demographic analysis.

Indirect methods are used to model population processes in order to interpolate data to replace missing observations. These methods provide estimates of local populations from partial data so that population numbers and locations can be projected[2]. The most recent resources for techniques for population estimation descent from the United Nations 'Manual X: Indirect Techniques for Demographic Estimation' of 1983 and subsequent work such as the '2002 United Nations Manual of Adult Mortality Estimation'. These resources for demographic modelling significantly include the joint Eurostat and UNECE Work Sessions on Demographic Projections and the 'Tools for Demographic Estimation' issued in 2013 by the United Nations Population Fund (UNFPA) and the International Union for the Scientific Study of Population (IUSSP).

'Population Europe: The European Population Partnership' provides a network for demographic research.

Box E.13.3 summarises the latest forecast of national and regional population and households in Morocco.

2 The Wikipedia demography page gives an idea of the range of approaches.

Box E.13.3: The projections of population and households in Morocco for 2014-2050

Following the publication of the results of the National Survey on Population and Health undertaken in 2010-2011 and of the General Population and Housing Census of 2014, the Centre d'Etudes et de Recherches Démographiques (CERED), part of the High Commission for Planning, updated the demographic projections for Morocco. Indeed, these made it possible to provide recent data on the demographic parameters necessary for the projections, such as the levels of fertility, mortality and internal and international migration.

These data were taken into account to update population projections at the national, urban and rural levels. To do this, the component method, used by a large number of demographers and international organizations, including the United Nations and the World Bank, was applied.

Since fertility is the factor that most affects the future development of the population, unlike mortality, and as it is impossible to predict with certainty future fertility behaviour, these projections have been established according to three variants called "high", "medium" and "low". According to the "average" variant, future fertility declines moderately, while under the "high" and "low" variants it decreases slowly and rapidly respectively, making it possible to create upper and lower limits of a relative margin of uncertainty to the "average".

The projections highlighted the following main features for the future (under the "medium" variant):

- An additional demographic growth by some 272 000 inhabitants per year
- A gradual decline in the number of young people
- Constantly large classes at active ages for a long time
- An inevitable ageing of the population
- A doubling in the number of households
- A decrease in the number of people per household

Source: 'Rapport sur les projections de la population et des ménages entre 2014 et 2050' and 'Projections de la population et des ménages 2014-2050' (2016), CERED, Morocco

E.13.2.4 STATISTICS ON INTERNATIONAL MIGRATION AND FORCED MIGRATION

The core reference document for statistics on international migration is the 'Recommendations on Statistics of International Migration, Revision 1'. This was published in 1998 by the UNSD in co-operation with Eurostat. The publication was a response to the growing size and importance of international migration. Governments wish to identify migration flows, measure the number of migrants and monitor changes over time. The statistics are intended to provide governments with a factual basis on which to formulate and implement policies. These recommendations recognise that migration statistics were often either non-existent or hard to interpret. Implementing the recommendations is needed to publish conceptually sound and comparable statistics. The document itself notes that this 'will take time'. Currently, more than 20 years on from the release of these recommendations, the international community is working on developing 'Revision 2' of this publication.

The range of government policies that can be affected by international migration is wide.

Policy in reception countries tends to regulate immigration and manage migrants' stay, focusing on integrating migrants into the economy and society. The main interest in reception countries tends to be in the number of new arrivals and in the total number of foreigners present. There is usually less interest in the numbers of foreigners departing, unless this is a specific policy objective. Reception countries may therefore wish to collect statistics about:

- The numbers, characteristics and location of migrants;
- The utilization of local services such as schools, health facilities, welfare services, accommodation, etc.;
- The effect of migration on local employment and the national labour market;
- The impact on the social security and pension systems and their future liabilities.

Tracking studies can be used to analyse the integration process.

To protect their citizens abroad, countries of origin may wish to monitor migrants' arrangements prior to departure and living conditions afterwards. These countries may also want to collect information about intending and actual migrants and whether their stay is likely to be temporary or permanent; historically, they have been less interested in information on returning citizens. Emigration countries may also wish to collect information on migrants' remittances and their impact on savings, investment and local development.

These policy considerations also apply to non-permanent migrants who work for defined time periods in reception countries, ranging from a few months to many years, and who may or may not gain residency rights. These are often groups of workers organised on a bilateral basis between the origin and reception countries. Although these people are, by definition, usually not permanent migrants, the migration statistics framework needs to identify them correctly.

The policy objectives of reception and emigration countries are therefore very different. This means that the two groups of countries are likely to collect different data. Nevertheless, there is a common interest in comparable and reliable migration data, as there is a common need to forecast the future actions of migrant populations and to understand the relation between migration and development.

The 'Recommendations on Statistics of International Migration' identify many of the key questions of interest to governments that migration statistics aim to answer. Not all of these questions will be relevant to each country, but they provide a framework for the development of comparable statistics:

- What is the overall annual net gain or loss of population through international migration?
- How many international migrants are admitted annually? Which are their countries of origin?

- In countries having free establishment provisions for the citizens of selected states, how many migrants exercise such a right over the course of a year? What are their countries of origin?
- How many citizens emigrate every year? Which are their countries of destination?
- How many emigrant citizens return every year? From which countries are citizens returning?
- How many migrant workers are admitted annually? How many leave the country for good every year?
- How many persons in search of asylum arrive annually? How many international migrants are admitted on humanitarian grounds (including refugees)?
- How many persons are admitted for family reunification over a year?
- How many persons who do not qualify as tourists are admitted for periods shorter than a year? Among them, how many are allowed to work in the receiving country?
- What is the total number of international migrants in the country? How many of those international migrants are economically active?
- How many foreign citizens acquire the citizenship of the reception country?

Countries do not use the same criteria to determine who is an international migrant. This situation has long been recognized as a key source of inconsistency in international migration statistics. Box E.13.4 presents the recommended definitions of short and long-term migrants and of the country of usual residence.

Box E.13.4: Definition of country of usual residence, long-term international migrant and short-term international migrant

Country of usual residence

The country in which a person lives, that is to say, the country in which he or she has a place to live where he or she normally spends the daily period of rest. Temporary travel abroad for purposes of recreation, holiday, visits to friends and relatives, business, medical treatment or religious pilgrimage does not change a person's country of usual residence.

Long-term migrant

A person who moves to a country other than that of his or her usual residence for a period of at least a year (12 months), so that the country of destination effectively becomes his or her new country of usual residence. From the perspective of the country of departure, the person will be a long-term emigrant, and from that of the country of arrival, the person will be a long-term immigrant.

Short-term migrant

A person who moves to a country other than that of his or her usual residence for a period of at least 3 months but less than a year (12 months) except in cases where the movement to that country is for purposes of recreation, holiday, visits to friends and relatives, business, medical treatment or religious pilgrimage. For purposes of international migration statistics, the country of usual residence of short-term migrants is considered to be the country of destination during the period they spend in it.

Source: 'Recommendations on Statistics of International Migration. Revision 1', United Nations

Whereas international migration flows can be defined in terms of the numbers of people changing their country of residence, stocks of migrants within the overall population can be defined according to citizenship or country of birth.

Wherever possible, citizenship and country of birth should not be used as proxies for each other.

Citizenship is widely recorded in administrative systems as this frequently impacts on a person's rights to enter, reside and work in a country. However, migrants can and often do change citizenship, often being granted the right to acquire the citizenship of the new country of residence after a number of years or following marriage to a national citizen. Depending on the specific national rules for acquiring citizenship, national citizens of the reporting country may also include many people who are foreign born and who were previously recorded as foreign citizens. It is therefore useful to collect statistics on acquisition of citizenship.

Defining migrant stocks according to country of birth has the advantage that a person's place of birth is fixed and will not change. However, country of birth may not be well recorded in some administrative data sources. It should be noted that native-born persons might be foreign citizens – as many countries do not automatically grant citizenship to children born in their territory, with children instead taking the citizenship of their parents.

The following potential data sources for migration statistics are identified by the Recommendations:

- Population registers
- Registers of foreigners
- Issuance of residence permits
- Issuance of work permits
- Official clearance of departing migrant workers
- Processing of requests for asylum
- Records from regularization drives
- Border systems
- Censuses
- Household surveys
- Reports to tax or social security authorities
- Establishment business surveys
- Registration of individuals in special insurance schemes
- Reports from labour recruitment agencies
- Apprehension and deportation systems
- Registers of acquisitions of citizenship of the destination country by foreign citizens

The 'Recommendations' do not guide the user on how to obtain acceptable measures of undocumented or irregular migration. Irregular migration mainly came into focus in the last 25 years or so, with the flows of people without documents or permissions migrating from partner countries towards similar countries (often for transit reasons) or developed countries, remaining in the receiving countries without the necessary documentation. Other cases concern foreigners who overstay in the receiving countries beyond the validation of a visa ('visa overstayers'). Operations within the

countries, at border points, along the borders and on the sea enable national authorities to identify and apprehend such groups of migrants, which often include vulnerable persons such as unaccompanied children and victims of human trafficking. Other irregular migrants may leave a trace, e.g., by registering, sending remittances or using health facilities.

Although the coverage of irregular migrants may be partial due to the unregistered nature of their migration, it is possible to establish statistics and profiles for those under the control of national authorities, including the identification of cases of return to the country of origin or resettlement in a third country. Very few national statistical institutes publish data on irregular migration, as this is mainly assigned to administrative bodies and police services. In any case, in some cases data on irregular migration should be considered as estimates or partial measurements rather than statistics.

Box E.13.5: The EU contribution to migration statistics in Africa under the Pan-African Statistics Programme

In recent years, Eurostat has been involved in the implementation of the Pan African Statistics (PAS) Programme. PAS was a large EU financed statistical capacity developing programme aimed at assisting the African Union Commission (AUC) in developing its statistical capacity, improving the production and dissemination of good quality official statistics at AU and country level and strengthening the coordination of all actors engaged in producing official statistics for Africa. The Programme's objectives built on the Strategy for the Harmonization of Statistics in Africa (SHASA) and the African Charter on Statistics. One of the first PAS projects focused on a series of priority sectors, including migration statistics.

Concerning migration statistics, PAS assisted the AUC in defining the work to be undertaken in the sector, including in particular the support to the ongoing Joint Labour Migration Programme of the AUC, ILO and others with the collection and assessment of data and revision of the methodology. In addition, the Programme and AUC engaged the Global Initiative against Transnational Organised Crime (GI-TOC) for establishing a methodology for data collection on irregular migration and associated protection risks in Africa. The proposed methodology was discussed and approved during an Expert Group Meeting held in Addis Ababa in 2018. Several African countries expressed interest in implementing the methodology. In 2019/2020, three of these countries, namely Botswana, Tunisia and Kenya, participated in a pilot phase covering data and capacity needs assessment, data collection and capacity building, modelling for data estimation, and the reporting. Following the preparatory stages, the assessment and data collection activities were conducted in these three countries to pilot the methodology on irregular migration and associated risks. The results of these pilot tests were delivered in 2021.

Source: Eurostat website and PAS newsletters.

Sometimes considered under international migration, the application for asylum, the recognition of the status of refugees and the internal displacement due to force represent other areas of increasing interest for policy and statistics, particularly in the African countries.

For statistics on asylum seekers and refugees, overall the countries face several challenges, including:

- Gaps in official statistics, including a lack of socio-economic data on refugees and asylum seekers;
- Lack of comparability between national statistics and across displacement situations within countries;
- Necessity to improve the understanding of concepts of flows and stocks of the different types of refugees;
- Necessity to build information systems useful for both the administrative and statistical needs;
- Measurement of forced population movements in humanitarian crises;
- Rapid change in the population distributions and so the sampling frames for surveys;
- Necessity to maximize the use of available data sources (e.g. by integrating questions into existing data sources) and to develop new data sources;
- Limited connection between national statistics on refugees and asylum seekers, often managed within immigration departments, and national statistics on migration and population;
- Extreme sensitivity of refugee and asylum seeker data and the importance of confidentiality and data protection in refugee statistics; and
- Significant variation across countries in terms of the size of forcibly displaced populations, the capacities of the national statistical and administrative systems, and national policy priorities, in particular for developing countries.

Some national authorities and international organizations such as UNHCR and Eurostat elaborate and publish statistics on refugees and asylum seekers. In many countries, this is undertaken by UNHCR until such time that the national authorities have developed the regulations on asylum and the capacity to produce their own statistics.

Several of the challenges mentioned above also apply to the statistical production on Internally Displaced Persons (IDPs). In addition, in this case statistics are elaborated by the NSOs, other national agencies and even international entities such as UNHCR and the Joint IDP Profiling Service (JIPS).

To support the countries worldwide and under the same framework, between 2016 and 2020 the Expert Group on Refugee and IDP Statistics (EGRIS) working under the chair of Eurostat, UNHCR, JIPS and other international and national entities established the first international recommendations on refugee statistics and on IDP statistics. A Compiler Manual integrates these two tools, whereas the group will continue to support and promote the production and use of refugee and IDP statistics up to 2024.

Box E.13.6: The best practices of Somalia on IDP statistics, based on an operational humanitarian data collection, and SDG indicators disaggregated by displacement status

Prior to 2015, virtually all statistics on IDPs in the urban area of Mogadishu were based on data collected by humanitarian actors. This meant that data collected on IDPs were exclusively focused on populations residing in so-called IDP settlements, where IDPs were known to concentrate. As a result, all persons residing in these areas were automatically included in the IDP statistics. In 2015-16, however, a profiling exercise was undertaken in collaboration with local authorities, national authorities and humanitarian actors, which altered this practice. In the new profiling approach, IDPs were singled out from other population groups living in settlement areas through analyses of migration histories. The profiling revealed that approximately 85 percent of these populations were actual IDPs, while the rest represented members of the local urban population, Somali economic migrants, returned refugees, and refugees and migrants from other countries. From a resource perspective, this profiling approach helped to obtain more accurate information on the settlement areas where the most vulnerable and in-need-of-assistance populations were expected to live, regardless of their displacement history. The profiling did not, however, aim to produce comprehensive figures on IDPs in the whole city, although it was known that a large amount of the population in the city had been displaced at some point in the past. Rather than aiming to cover the total of this population, the process concentrated on obtaining more targeted information about the settlement areas where the most vulnerable and in need-of-assistance populations were expected to live.

In addition to this, the Somali Government has decided to work towards monitoring 66 of the SDG indicators. It has categorised the SDGs into the groups of economic growth and related sectors, social services, climate change and the environment, and enablers to sustainable development, and there are efforts to disaggregate the SDGs by displacement status. These efforts are in line with Somalia's efforts to create a National Development Plan, which aims to develop monitoring and evaluation mechanisms for tracking these indicators and the path to achieving the targeted SDGs.

Source: Technical Report on Statistics of Internally Displaced Persons: Current practice and recommendations for improvement, EGRIS, 2018.

E.13.3. Data and metadata

The key global source on population statistics and forecasts is the UN 'World Population Prospects Database'. This is produced by the UN Population Division. It provides indicators and projections of total population and major demographic measures for the period 1950-2100 for all countries and regions.

The 'United Nations Demographic Yearbook' is produced by the UNSD. It provides more demographic variables than the Population database. Occasionally, the yearbook covers special topics such as the results of population projections or population censuses.

Other global demographic publications are available from the website of the UNSD, Demographic and Social Statistics. Examples are the biannual vital statistics data and the World's Women reports.

Data on the international migrant stock is also available on the UN Population Division website, with updates every two years. Other global population and urbanisation data series and metadata can also be found on this website.

The 'Recommendations on Statistics of International Migration' note that African statistics on migration are often missing, unavailable or not comparable. More recently, this situation has been confirmed by the data collection and consultations under the 'Joint AU/ILO/IOM/UNECA Labour Migration Program' (JLMP) and other initiatives. The new African Migration Observatory will take on the gathering of data relevant under the Global Compact for Safe, Orderly and Regular Migration (GCM). Properly carried out, the initiatives discussed in section E.13.5 below should start to address the absence or penury of data.

The International Organization for Migration (IOM) has the key objectives to enhance the capacity of governments to collect reliable and comprehensive statistics and data on migration and to advance the understanding of migration issues more generally. The IOM also compiles statistics on issues such as emergency and post-emergency repatriation, resettlement, assisted voluntary return, health of migrants, trafficking and internal displacement and return. Among others, several IOM missions worldwide adopt the Displacement Tracking Matrix (DTM) in order to capture, process and disseminate information to provide a better understanding of the movements and evolving needs of displaced populations, whether on site or en route. The IOM Global Migration Data Analysis Centre (GMDAC), created in 2017, presents data through its 'Migration Data Portal'.

The domains 'Population and Demography Statistics' and "Migration and Asylum Statistics' of Eurostat's website provide a standard for demographic and migration data dissemination, including a range of statistics on annual or longer basis such as the population census rounds for the EU and about 25 other countries and territories:

- Demographic data on population and various demographic
- events (births, deaths, marriages and divorces) broken down by several characteristics such as age, gender, legal marital status and educational attainment;
- Demographic indicators such as total fertility rate, life expectancy at birth, age-dependency ratios, crude rates of births, deaths and population growth;
- Statistics on the population and housing censuses, offering regional detail and several cross-tabulated data, are available every ten years from the censuses conducted in EU Member States;
- Population projections at national and regional level, providing information on the likely future size and structure of the population, according to different what-if scenarios
- Migration and citizenship, including information on population stocks by citizenship and country of birth, on migration flows by citizenship, country of birth and country of previous/next residence, and on acquisition of citizenship;

- Residence permits granted to non-EU citizens, disaggregated by citizenship, length of validity and reasons for the permit being issued;
- Asylum statistics, including data on asylum applicants, first instance and final decisions on asylum applications, requests for taking back or taking charge of asylum seekers within the framework of Dublin procedure;
- Statistics on the enforcement of immigration legislation, providing data on non-EU citizens refused entry at the EU external borders, found to be illegally present or ordered to leave, and on actual removals of non-EU citizens whose presence was unauthorised.

E.13.4. Analysing data quality and identifying problems

The key question for population and demographic data is whether the terms used correspond to the usual international classifications. One example is whether the standard five-year age groups are adhered to: 0-4; 5-9; 10-14 etc.

Demographic data is of much higher quality if it is based on a universal and up-to-date population register. The sources of demographic data should be ascertained and improved, particularly in partner countries. The number of entries in the population register might be compared with the estimated population. Technical development may allow for improvement, even on the basis of sources of limited quality or limited coverage.

In looking at migration statistics, data concepts should be compatible with those laid out in the relevant recommendations. However, one should not look for completeness, as it is understood that most countries will only produce a subset of the migration statistics framework that meets their own and their partners' needs. A potential tool for validating results is to use mirror techniques between the two sides of international migration flows: this is still adopted only to a limited extent, also due to the lack of basic statistics in many countries and due to differences in definitions. Overall, migration statisticians attempt to integrate more and more data available from different sources. Moreover, sub-sectors such as internal displacements are considered only in the selected countries which are affected by the phenomenon. The best practices adopted are widely shared through international meetings and events held at regional or global level. The 'International Forum on Migration Statistics' (IFMS), which was organised by OECD, IOM and UNDESA in 2018 in Paris and 2020 in Cairo, represents the most important event on that.

E.13.5. Improving sector statistics

Historically, EU support for population and migration statistics has focused on the central issue of census funding. A high-profile example was the support for the '2005/06 Nigeria Census Support Initiative', which had a contribution of EUR 116.5 million. A common implementation mechanism for that has been a contribution agreement with UNDP and UNFPA.

An important theme for census improvement is cost limitation. This is because the cost of carrying out population censuses in low and middle-income countries is very high relative to most other statistics activities. Low and middle-income countries sometimes have difficulties financing their census. The '2001 UNFPA/PARIS21 International Expert Group Meeting on Censuses' included a critical appraisal of census costs, backed by examples in many partner countries. At that time, UNFPA prepared a publication on strategies for reducing costs. The subject of census costs has later been considered successively by specific papers and guides such as the UNFPA 'Population and Housing Censuses - Strategies for Reducing Costs' and 'Counting the People: Constraining Census Costs and Assessing Alternative Approaches', some Census Knowledge Base papers, as well as the UN recommendations on census. Among other, the self-completion of the census questionnaires via Internet was adopted in several developed countries.

Another important area of action for the sector is improving the exploitation and dissemination of census data. This was initially brought into focus by the '2003 UNFPA/PARIS21 International Expert Group Seminar', whose objectives were:

- review census data dissemination and use in the 2000 round of censuses;
- establish partnerships between users and producers to maximize use of census data;
- ensure that quality population-based data are disseminated and used for national planning, poverty reduction strategies, monitoring of national and international development goals.

Several recommendations and actions for the successive rounds of censuses followed the same lines. They also include the PARIS21 advocacy videos on the African perspective for the population census dissemination.

Concerning other areas of population and migration statistics, improving civil registration and vital statistics systems in partner countries, in particular in Africa, is still a major issue. There is little prior experience in supporting this type of action. The objective is to provide improved statistics between censuses and to reduce or eliminate the need for large-scale inter-censal surveys. Analysis should look at whether the information recording system proposed is realistic. Will the system be accessible to the citizens who need to record vital events? Will the resulting statistics be consistent with international recommendations? Utilising regional experience could help ensure that planned actions can be sustained. The current focus on civil registration and vital statistics in Africa is discussed further in Box E.13.2.

Among other areas, current aims are also to increase the availability and comparability of data on international migration and to have more national authorities involved in the production of statistics of refugees and IDPs, where relevant, according to the recently established international requirements. These objectives can be seen as complementary to the support to the population censuses.

New technologies, including smartphone-based technologies, are starting to be applied in censuses, vital statistics and migration statistics. A seminar on 'New Technologies in Population and Housing Censuses: Country experiences' linked to the 42nd session of the UN Statistical Commission was held in February 2011. The paper by the Brazilian Institute of Statistics and Geography (IBGE) on IT in the 2010 Brazilian Census is of particular interest. The topic of new technologies in the census has been followed up at many other international events later. Among others, the US Census Bureau has issued a website entitled 'Four ways new technology is revolutionizing the 2020 Census'.

In supporting demographic analysis, the outputs and the main data sources available need to be defined in the terms of reference. The analyst will need to justify not only the selection of an appropriate demographic tool but must also make clear how the model parameters are arrived at.

EU support for developing migration statistics in other countries presupposes that there is a mutual interest in monitoring migration flows between the two parties. Both sides need to be clear regarding which statistics can be produced to meet the data needs. In any case, the resulting statistics should be designed to follow international definitions.

To find out more…

Recent and current initiatives and activities

- African Union: Africa Civil Registration and Vital Statistics Day
- UN Economic Commission for Africa (UNECA): Africa Programme for Accelerated Improvement of Civil Registration and Vital Statistics
- UN Economic Commission for Africa (UNECA): Why improving civil registration and vital statistics systems in Africa is important (2017)
- UN Economic Commission for Africa (UNECA): Report on the status of civil registration and vital statistics in Africa: outcome of the Africa programme on accelerated improvement of civil registration and vital statistics systems monitoring framework (2017)
- Fifth Conference of African Ministers Responsible for Civil Registration: The civil registration and vital statistics systems improvement framework (2019)
- United Nations Statistics Division (UNSD): World Population and Housing Census Programme
- United Nations Department of Economic and Social Affairs (UNDESA): Sustainable Development Goals
- Migration data and the Sustainable Development Goals
- United Nations Statistics Division (UNSD): United Nations Expert Group on Migration Statistics - meetings
- Eurostat, UNHCR and other entities: Expert Group on Refugee, Internally Displaced Persons and Statelessness Statistics (EGRISS)
- Eurostat-UNECE Work session on demographic projections, 2019
- UNECE: Work session on migration statistics
- International Forum on Migration Statistics
- Joint IDP Profiling Service (JIPS)
- Population Europe (The Network of Europe's Leading Demographic Research Centres)

Further strategies and methodologies

- United Nations Statistics Division (UNSD): Principles and recommendations for a vital statistics system, Revision 3 (2014)
- United Nations Statistics Division (UNSD): Handbooks on Civil Registration and Vital Statistics Systems
- United Nations: Principles and Recommendations for Population and Housing Censuses, Revision 3
- United Nations Statistics Division (UNSD): Recommendations on statistics of international migration, Revision 1 (1998)
- Expert Group on Refugee and Internally Displaced Persons Statistics (EGRIS; precursor to EGRISS): International Recommendations on Refugees Statistics (IRRS) (2018)
- Expert Group on Refugee and Internally Displaced Persons Statistics (EGRIS; precursor to EGRISS): International Recommendations on Internally Displaced Persons Statistics (IRIS) (2020)
- Expert Group on Refugee and Internally Displaced Persons Statistics (EGRIS; precursor to EGRISS): Technical Report on Statistics of Internally Displaced Persons: Current practice and recommendations for improvement (2018)
- US Census Bureau: Four ways new technology is revolutionizing the 2020 Census

Data and metadata

- CERED, Morocco: Projections de la population et des ménages 2014-2050
- CERED, Morocco: Rapport sur les projections de la population et des ménages entre 2014 et 2050
- United Nations Statistics Division: Demographic and Social Statistics
- United Nations Statistics Division: Demographic Yearbook
- United Nations Population Division: International Migrant Stock
- United Nations Population Division: World Population Prospects
- IOM Global Migration Data Analysis Centre (GMDAC): Migration Data Portal
- IOM: Displacement Tracking Matrix
- World Bank: Migration and Remittances Factbook
- Official Inauguration of the African Migration Observatory
- African Union, STATAFRIC: African Migration Observatory
- IPUMS: Harmonized International Census microdata
- Integrated European Population Microdata (IEPM)
- Eurostat: Population and demography statistics
- Eurostat: Migration and asylum statistics
- Eurostat: Statistical classifications

Other background

- European Commission and United Nations: Migration and Sustainable Development
- United Nations Population Division: Publications
- World Bank: People move (blog)
- Global Forum on Migration and Development
- PARIS21 videos on Population Census Dissemination: the African Perspective part 1 and part 2

E.14 Education statistics

E.14. Education statistics

The chapter in brief

Education is widely accepted as a fundamental resource for individuals as well as societies. In many countries, basic education is nowadays perceived not only as a right for citizens, but also as a duty for governments. This chapter covers education statistics, covering educational participation, illiteracy, educational institutions and systems, human and financial resources invested in education. Due to the complex role of education statistics for social and economic development planning, national and international agencies are actively seeking to improve them in order to obtain a robust means for decision-making, monitoring and evaluation. The main issues of the education statistics centres on the quality of national statistics received as well as the quality of the internal systems for collection, processing, analysis and dissemination of the data and metadata.

The chapter starts by identifying the main policy areas for which these statistics are used and continues by providing a user's view of the statistics involved. The chapter then identifies the main sources of data and information about methods, continues by discussing how to analyse the quality of the statistics in these fields and concludes with information on complementary sources.

E.14.1. Policy applications: what these statistics are used for

The education sector plays a complex role in a country's social and economic development, presenting both a challenge and an opportunity for sustainable development. A country's successful social and economic development depends notably on a robust and sustainable education system as skilled human capital is seen as a key factor to improve people's welfare. In addition, there is empirical evidence that shows that the education level of a country is positively linked with economic growth. Therefore, the design and implementation of an effective education system and reforms in the education sector are a priority of governments. Hence, national education statistics, as well as international ones, are instrumental to inform adequately these policy reforms.

Education statistics are collected mainly by governments and international institutions to design, implement, monitor and evaluate education policies. These statistics are used to assess the alignment of the capacity and performance of the education system to the national education program and also to assist in planning for further development of the education sector.

The education statistics are used mainly to: (i) distinguish between the actors in the education systems (individual learners, instructional settings and learning environments, education service providers, the education system); (ii) measure learning outcomes for individuals and countries; and (iii) identify the policy issues (quality of educational outcomes, equity and opportunities, adequacy and effectiveness of resources management).

Specifically, education statistics allow for an assessment of the:

- access to and participation in education;
- demand for and supply of educational opportunities (students, teachers etc.);
- individual learning outcomes;
- impact of education on personal growth;
- well-being of all education beneficiaries (individual, community, country);
- study of the causes in disparities, and their effect on social and economic development;
- quality of the teaching and learning process;
- internal efficiency of the education system;
- concern for equity in education.

E.14.2. Concepts and definitions

The education statistics discussed here include data on educational participation, illiteracy, educational institutions and systems, human and financial resources invested in education, lifelong learning, vocational training and adult learning, impact of education, assessments of student performance, etc.

In order to promote common definitions and concepts of education statistics and enable international comparisons, UNESCO designed the International Standard Classification of Education (ISCED). ISCED is a framework for assembling, compiling and analysing cross-nationally comparable statistics on education. The current classification is ISCED 2011, adopted in 2011, covering the levels of education of programmes (ISCED-P) and introducing a classification of levels of educational attainment based on qualifications (ISCED-A). In 2013, this was complemented by a revised classification of education and training fields (ISCED-F). In addition, a comprehensive list of education indicators, their definitions, purposes, calculation methods, and formulae have been developed and maintained by the UNESCO Institute for Statistics (UIS). In addition, the UIS also maintains a glossary of the main education concepts.

Education, according to the ISCED 2011, is defined as "organised and sustained communication designed to bring about learning". The OECD Handbook of Internationally Comparative Education Statistics, most recently updated in 2018, presented the ISCED 2011 education classification under the following categories:

Early childhood education (ISCED levels 01 and 02) provides learning and educational activities with a holistic approach to support children's early cognitive, physical, social and emotional development and to introduce young children to organised instruction outside of the family context. It aims to develop some of the skills needed for academic readiness and to prepare them for entry into primary education.

Primary education (ISCED 1) provides learning and educational activities typically designed to provide

Box E.14.1: Links between Education and the Sustainable Development Goals

Building on the achievements towards reaching the Millennium Development Goals, in September 2015 the UN Sustainable Development Summit adopted the 'Transforming our world: the 2030 Agenda for Sustainable Development", also known as the Sustainable Development Goals (SDGs). The Sustainable Development Goals comprises a framework consisting of 17 goals with 169 specific targets and 231 unique indicators to measure progress towards these. The environment dimension of the Sustainable development agenda is covered by the following goal, targets and indicators:

Sustainable Development Goal 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

Target 4.1: By 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes.

Indicators: 4.1.1 Proportion of children and young people:
(a) in grades 2/3;
(b) at the end of primary; and
(c) at the end of lower secondary achieving at least a minimum proficiency level in (i) reading and (ii) mathematics, by sex

Target 4.2: By 2030, ensure that all girls and boys have access to quality early childhood development, care and pre-primary education so that they are ready for primary education.

Indicators: 4.2.1 Proportion of children under 5 years of age who are developmentally on track in health, learning and psychosocial well-being, by sex.
4.2.2 Participation rate in organized learning (one year before the official primary entry age), by sex

Target 4.3: By 2030, ensure equal access for all women and men to affordable and quality technical, vocational and tertiary education, including university.

Indicators: 4.3.1 Participation rate of youth and adults in formal and non-formal education and training in the previous 12 months, by sex.

Target 4.4: By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship.

Indicators: 4.4.1 Proportion of youth and adults with information and communications technology (ICT) skills, by type of skill.

Target 4.5: By 2030, eliminate gender disparities in education and ensure equal access to all levels of education and vocational training for the vulnerable, including persons with disabilities, indigenous peoples and children in vulnerable situations.

Indicators: 4.5.1 Parity indices (female/male, rural/urban, bottom/top wealth quintile and others such as disability status, indigenous peoples and conflict affected, as data become available) for all education indicators on this list that can be disaggregated.

Target 4.6: By 2030, ensure that all youth and a substantial proportion of adults, both men and women, achieve literacy and numeracy.

Indicators: 4.6.1 Percentage of population in a given age group achieving at least a fixed level of proficiency in functional (a) literacy and (b) numeracy skills, by sex.

Target 4.7: By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development.

Indicators: 4.7.1 Extent to which (i) global citizenship education and (ii) education for sustainable development, including gender equality and human rights, are mainstreamed at all levels in: (a) national education policies, (b) curricula, (c) teacher education and (d) student assessment.

Target 4.a: Build and upgrade education facilities that are child, disability and gender sensitive and provide safe, non-violent, inclusive and effective learning environments for all.

Indicators: 4.a.1 Proportion of schools with access to: (a) electricity; (b) the Internet for pedagogical purposes; (c) computers for pedagogical purposes; (d) adapted infrastructure and materials for students with disabilities; (e) basic drinking water; (f) single sex basic sanitation facilities; and (g) basic hand washing facilities (as per the WASH indicator definitions).

Target 4.b: By 2020, substantially expand globally the number of scholarships available to developing countries, in particular least developed countries, small island developing States and African countries, for enrolment in higher education, including vocational training and information and communications technology, technical, engineering and scientific programmes, in developed countries and other developing countries.

Indicators: 4.b.1 Volume of official development assistance flows for scholarships by sector and type of study.

Target 4.c: By 2030, substantially increase the supply of qualified teachers, including through international cooperation for teacher training in developing countries, especially least dev.

Indicators: 4.c.1 Proportion of teachers in: (a) pre-primary; (b) primary; (c) lower secondary; and (d) upper secondary education who have received at least the minimum organized teacher training (e.g. pedagogical training) pre-service or in-service required for teaching at the relevant level in a given country.

Accompanying the Sustainable development Framework is the Incheon Declaration, adopted by around 1600 participants at the World Education Forum in Incheon, Republic of Korea in May 2015. The Declaration represents the firm commitment of countries and the global education community to a single, renewed education agenda.

students with fundamental skills in reading, writing and mathematics (i.e. literacy and numeracy) and establish a solid foundation for learning and understanding core areas of knowledge and personal development, preparing for lower secondary education. It focuses on learning at a basic level of complexity with little, if any, specialisation.

Lower secondary education (ISCED level 2) is typically designed to build on the learning outcomes from ISCED level 1. Usually, the educational aim is to lay the foundation for lifelong learning and human development upon which education systems may then expand further educational opportunities. Programmes at this level are usually organised around a more subject-oriented curriculum, introducing theoretical concepts across a broad range of subjects.

Upper secondary education (ISCED level 3) is typically designed to complete secondary education in preparation for tertiary education, to provide skills relevant to employment, or both. Programmes at this level offer students more varied, specialised and in-depth instruction than in lower secondary education. They are more differentiated, with an increased range of options and streams available.

Post-secondary non-tertiary education (ISCED level 4) provides learning experiences building on secondary education, preparing for labour-market entry as well as tertiary education. It typically targets students who have completed upper secondary education (ISCED level 3), but who want to increase their opportunities to enter the labour market or progress to tertiary education. Programmes are often not significantly more advanced than those at upper secondary education as they typically serve to broaden – rather than deepen – knowledge, skills and competencies. They therefore aim at learning below the high level of complexity characteristic of tertiary education.

Tertiary education (ISCED levels 5 to 8) builds on secondary education, providing learning activities in specialised fields of education. It aims at learning at a high level of complexity and specialisation. Tertiary education includes what is commonly understood as academic education but also includes advanced vocational or professional education.

While the revision in 2011 concentrated primarily on changes to the levels of education of programs (ISCED-P) and introduced a classification of levels of educational attainment based on qualifications (ISCED-A), the revision in 2013 focused on the fields of education and training (ISCED-F). Ten broad fields were identified and each field broken into narrow fields and detailed fields. For example, the broad field of "Natural Sciences, Mathematics and Statistics", includes several narrow fields, among which is the narrow of "Biological and related sciences", which is split into the following detailed fields:

- Biology
- Biochemistry
- Biological and related sciences not elsewhere classified

Box E.14.2: Overview over ISCED

Each country's education system is dynamic and changes frequently in structure and curricular content. International comparison is thus difficult for policy makers. The international initiatives to facilitate comparisons of education statistics and indicators of different countries, on the basis of uniform and internationally agreed definitions, are coordinated by the United Nations Educational, Scientific and Cultural Organization (UNESCO) As education systems are constantly evolving, the ISCED framework is periodically updated. First developed in the mid-1970s, the International Standard Classification of Education (ISCED) has been revised several times.

The ISCED 2011 revision provides an integrated and consistent statistical framework for the collection and reporting of internationally comparable education statistics, covering both levels of education and training (ISCED-P) and levels of educational attainment based on qualifications (ISCED-A). The coverage of ISCED 2011 extends to all organised and sustained learning opportunities for children, youth and adults, including those with special educational needs, irrespective of the institutions or organisations providing them or the form in which they are delivered. In particular, ISCED 2011 took into account the many significant changes in education systems worldwide since the ISCED revision in 1997.

In ISCED 2011, the first level (ISCED 0) has been expanded to include a sub-category of the increasingly popular education programmes designed for children under three years old. At the same time, the classification of tertiary levels of education has changed substantially. ISCED 2011 has four levels of tertiary education, compared to two categories in the previous version. A main reason for this is to better reflect the tertiary education structure (Bachelor, Master and Doctorate), in particular in view of the implementation of the Bologna Process in Europe. ISCED 2011 also introduces educational attainment into the framework. Thus, ISCED offers a system to classify qualifications into educational attainment levels.

The mapping of country (national) data to those of the ISCED 2011 is critical to ensure the meaningfulness and comparability of the education data. A special 'Questions and Answers about ISCED 2011' section is available on UNESCO-UIS's website.

The revision in 2013 covered ISCED Fields of Education and Training (ISCED-F), enabling examination of fields of education in a separate process. ISCED-F has been implemented since 2016. The classification identifies ten broad fields of education:

00 – Generic programmes and qualifications
01 – Education
02 – Arts and humanities
03 – Social sciences, journalism and information
04 – Business, administration and law
05 – Natural sciences, mathematics and statistics
06 – Information and Communication Technologies
07 – Engineering, manufacturing and construction
08 – Agriculture, forestry, fisheries and veterinary
09 – Health and welfare
10 – Services

Numerous statistical indicators are collected in order to give a complete overview of education system . The main indicators are:

Adult Literacy Rate (ALR): The ALR is the percentage of total population aged 15 years and over who can both read and write with an understanding of a short simple statement on his/her everyday life. Generally, 'literacy' also encompasses 'numeracy', which is the ability to make simple arithmetic calculations. The ALR shows the accumulated achievement of primary education and literacy programmes in imparting basic literacy skills to the population, thereby enabling them to apply such skills in daily life and to continue learning and communicating using written words. Literacy represents a potential for further intellectual growth and contribution to the economic-socio-cultural development of a society.

Youth Literacy Rate (YLR) or - Literacy rate of 15-24 year-olds: The YLR is defined as the percentage of the population aged 15 to 24 years old who can both read and write, with understanding of a short, simple statement about their everyday life. YLRs are increasingly used to assess the impact of primary education as well as the speed with which illiteracy can be eradicated. In general, literacy data can measure the achievement of literacy programs and primary education.

School-Life Expectancy (SLE): The SLE is a measure of how many years of education the average population of a country receives in their lifetime. It is used to compare and assess the development of a country.

Transition Rate (TR): The TR conveys information on the rate of access (or transition) from one cycle of education to a higher one. This is expressed as the percentage of pupils who graduate from one level of education and move on to the next higher level.

Net Enrolment Rate (NER): The NER is defined as the enrolment of the official age-group for a given level of education expressed as a percentage of the total population from the same age group. A high NER implies a high degree of participation of the official school-age population.

Gross Enrolment Ratio (GER): The GER is defined as the total enrolment, regardless of age, expressed as a percentage of the official school-age population for a given level. The GER shows general levels of participation in education. When net (aged-based) enrolment data are not available, gross enrolment can be used as a substitute indicator. This data can also be compared to net enrolment figures to indicate the extent of over- and under- aged enrolment. A GER of 100% or more indicate that a country is, in principle, able to accommodate all of its school-age population.

Repetition Rate (RR): The RR is the proportion of pupils who enrol in the same grade/year more than once to the total number of pupils/students enrolled in that grade/year during the previous year. The RR helps to measure the effect on the internal efficiency of educational systems.

Dropout Rate by Grade (DR): It is the proportion of pupils from a cohort enrolled in a given grade at a given school year, but who are no longer enrolled in the following school year. The DR measures the trend of pupils leaving school without completion, and its effect on the internal efficiency of educational systems. In addition, it is one of the key indicators for analysing and projecting pupil flows from grade to grade within the educational cycle.

Survival Rate (SR) - It is the percentage of pupils enrolled in the first grade of a given level or cycle of education in a given school year who reach the final grade at the end of the required number of years of study. The SR measures the retention capacity and internal efficiency of an education system. It illustrates the situation regarding retention of pupils (or students) from grade to grade in schools, and conversely the magnitude of dropouts by grade.

Public expenditure on education as % of total government expenditure: It is the total public expenditure on education (current and capital) expressed as a percentage of total government expenditure (current and capital) in a given financial year. This indicator assesses a government's policy emphasis on education relative to the perceived value of other public investments. It reflects also the commitment of a government to invest in human capital development.

Public current expenditure per pupil as % of GNP per capita: It represents public current expenditure per pupil (or student) at each level of education, expressed as a percentage of GNP per capita in a given fiscal year. This indicator contributes to assess a country's investment in its human capital development and to measure the relative emphasis placed by the country on a particular level of education.

Pupil-Teacher Ratio (PTR): The PTR is the average number of pupils (students) per teacher at a specific level of education in a given school year. It measures the level of human resources input in terms of the number of teachers in relation to the size of the pupil population.

Percentage of female teachers: it is the number of female teachers at a given level of education expressed as a percentage of the total number of teachers (male and female) at the same level in a given school year. This indicator shows the gender composition of the teaching force. It helps also in assessing the need for opportunities and/or incentives to encourage women to participate in teaching activities at a given level of education.

Gender Parity Index (GPI) - Ratio of girls to boys: The GPI is the ratio of female to male values of a given indicator. It measures progress towards gender parity in education participation and/or learning opportunities available for women in relation to those available to men. It also reflects the level of women's empowerment in society.

E.14.3. Sources of data

Education statistics are collected from two main sources: (i) Administrative data and periodic school surveys; and (ii) Population censuses and household surveys. Administrative data are the primary country's source of education statistics and cover the whole country on an annual basis. These data are based on school reporting, generally at the beginning of the school year. School- based surveys focus on pupils only with no information on household characteristics and children who do not attend school. The shortcomings of these data are their quality in terms of coverage, which is often incomplete, thus impairing the accuracy of the statistics, and their comparability between countries, which is limited when the statistical definitions used are not in line with the agreed international standards.

Population censuses and household surveys provide a good complement to administrative data. Indeed, individual and household information collected through these surveys are instrumental to better analyse education data. Also, information on children's background and schooling decision can also be assessed. However, these data refer to the resident population and not to the education system; it may be difficult to relate these data to other education statistics for two reasons. The first is that the situation of the resident population concerning education may reflect the education system of another country, in case of immigrants, while missing some of the persons who were educated in the country, i.e., emigrants. This is as relevant as the migration flows are significant. The second reason is that the results of general population surveys refer to an age cohort of the population which may have been subject to the educational systems in very different moments in time, while statistics on the educational systems refer to their situation in one specific school or academic year.

Internationally comparable education statistics are mainly administrative data, collected through data collections run by international institutions. The UNESCO Institute for Statistics (UIS) uses a questionnaire to collect, annually, these data with the relevant national authorities of 200 countries (for example, Ministries of Education, Ministries of Finance or the National Library). The UIS education database, with more than 200 countries and territories, is the most comprehensive education data set in the world. It covers all education levels and a range of issues such as gender parity, teachers and financing. Worldwide statistics on education are collected through these major data collections:

UIS survey: The UIS education survey questionnaires are sent to UNESCO Member States/Countries annually. The questionnaires are based on international standards, classifications and measures that are regularly reviewed and modified by the UIS in order to address emerging statistical issues and improve the quality of data.

UOE survey: UNESCO-UIS, the OECD and Eurostat (UOE) have jointly administered this annual data collection since 1993. The UOE questionnaire compiles data from high and middle-income countries that are generally members or partner countries of the OECD or the European Union. The UOE survey gathers more detailed education statistics and allows for production of a wider set of indicators. Additionally, Eurostat collects subnational data on enrolments, foreign language learning and short-term learning mobility.

Literacy statistics for adults aged 15 years and older and for youth aged 15 to 24 years are available from national population censuses, household surveys and estimates using the UIS Global Age-Specific Literacy Projections Model (GALP). The methodology to implement this survey is discussed in the report "Global Age-Specific Literacy Projections Model (GALP): Rationale, Methodology and Software".

Statistics on educational attainment for the population aged 25 years and older are based on national population censuses or surveys. Population data are based on the World Population Prospects by the United Nations Population Division (UNPD). Data on economic indicators such as gross domestic product (GDP) can be obtained from the World Bank and education public expenditure from the UIS.

Data on teachers and the curriculum have been collected since the early 1990s by the OECD through its "Teachers and the Curriculum" survey. Data cover: (i) Compulsory and non-compulsory intended instruction time for students; (ii) Teachers working time and teaching time; and (iii) Annual statutory teacher compensation.

Data on **educational attainment** of the adult population are collected as part of the Annual Labour Statistics data request, which is conducted by the OECD in February/March each year. The National Statistical Offices provide data on employment, unemployment and population by National Educational Attainment Categories (NEAC), by gender and age groups. Data are derived from National Labour Force Surveys. They are mapped to ISCED 2011 levels of attainment using the agreed mapping from NEAC to ISCED 2011 standardized levels of attainment established by the Network B of the OECD education indicator project after consultation with country representatives. Work status is reported according to the International Labour Organization (ILO) guidelines and definitions of employment and unemployment.

In addition to public examinations at the end of educational cycles, some countries implement national assessments to have a comprehensive view of the learning standard and the system performance. These national assessments are sometimes linked with regional or international evaluations which allow comparisons of education systems. Beside these sources of general statistical data, several initiatives assess general or specific learning outcomes, including:

The OECD Programme for International Student Assessment (PISA), collected for the first time in 2000, is a three-yearly survey of the knowledge and skills of 15-year-olds in the main industrialised countries. It assesses young people's capacity to use their knowledge and skills in order to meet real-life challenges and, specifically, assesses literacy in reading, mathematics and science. The assessments are conducted through students sitting pencil and paper tests in their schools. The students and principals of the schools also answer questions about themselves and their schools allowing analysis of the factors that influence good and bad

performance. 79 countries/economies participated in PISA 2018.

The Out-of-School Children Initiative (OOSCI). UNICEF and the UNESCO Institute for Statistics launched OOSCI in 2012. The aim is to make a substantial and sustainable reduction in the number of out-of-school children worldwide. To this end, partner governments are provided with data that can be directly used to take action. OOSCI identifies barriers that lead to exclusion and develops proposals for policies and programmes that put more children in school. Over 90 countries participate, with many basing their education sector plans on OOSCI data.

The Trends in International Mathematics and Science Study (TIMSS). Since 1995, TIMSS reports every four years on the achievement of fourth and eighth grade students. It is an international assessment of student achievement in mathematics and science involving around 70 countries around the world. The evaluations are organized around two dimensions, a content dimension specifying the domains or subject matter to be assessed (number, algebra, geometry, data, biology, chemistry, physics, and earth science) and a cognitive dimension specifying the domains or thinking processes to be assessed (knowing, applying, and reasoning).

The Progress in International Reading Literacy Study (PIRLS) assesses the reading comprehension for students in their fourth year of formal schooling. In 2021, 57 countries and eight benchmarking entities participated in the PIRLS study.

The Southern and Eastern Africa Consortium for Monitoring Education Quality (SEACMEQ). Sixteen ministries of education in Southern and Eastern Africa share experiences, monitor and evaluate the conditions of schooling and the quality of education with technical assistance from UNESCO International Institute for Educational Planning (IIEP).

The Programme d'Analyse des Systèmes Éducatifs (PASEC). Created in 1991, this programme aims to assess learning skills in Francophone Africa and the Indian Ocean.

The Laboratorio Latino-Americano de la Evaluación de Calidad de la Educación (LLECE). Since 1994, with the support of UNESCO, the LLECE organises regional evaluations on teacher policies and pedagogical practices in Latin America and the Caribbean. LLECE has so far organised four rounds of the Regional Comparative and Explanatory Study. The ERCE 2019 is the fourth instalment of the study, measuring the learning achievements of students from educational systems in 18 countries.

Box E.14.3: Case study: Southern and Eastern Africa Consortium for Monitoring Educational Quality (SEACMEQ)

The SEACMEQ (formerly SACMEQ) is an international non-profit developmental organisation of 16 Ministries (Angola, Botswana, Kenya, Lesotho, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania (Mainland), Tanzania (Zanzibar), Uganda, Zambia and Zimbabwe) of Education in Southern and Eastern Africa.

The SEACMEQ's mission is "To undertake integrated research and training activities that will expand opportunities for educational planners and researchers to: (a) receive training in the technical skills required to monitor, evaluate, and compare the general conditions of schooling and the quality of basic education; and (b) generate information that can be used by decision-makers to plan the quality of education." Two key targets are drawn from this mission statement. Firstly, the main target audiences for SEACMEQ's activities were "educational planners and researchers". Second, the substantive content of SEACMEQ's activities was divided into two main areas: "training" (in technical skills) and "information generation" (for use by decision-makers).

SEACMEQ and Its research and training Programmes have evolved over the past decades in harmony with the increased scope and complexity of the four research and training projects in which it has been involved. This evolution has four phases: (i) an "Innovate" phase (1989-1994) in which the IIEP worked with a single country on an innovative experimental educational research and training project designed to address a major educational challenge related to planning the quality of education; (ii) the "collaborate" phase (1995-2004) where the IIEP encouraged several countries in the same region to work together on a mutually beneficial multi-country replication of the earlier experiment that drew upon lessons learned; (iii) the "consolidate phase" (1995-2004) where the control of participating countries over the whole of the research and training process is strengthened; and (iv) Finally there was the "Launch" (began in 2005) phase in which the participating countries assumed overall control of research and training directions, and began to make their own professional decisions about who assisted them and how they were to be assisted.

The use of SEACMEQ research and training resources by ministries, international organizations, bilateral organizations, universities, and individual researchers and planners is increasing. SEACMEQ resources have been used by various planners and researchers, national and international bodies such as ministries of education, international/bilateral organizations, universities, individual educational planners and researchers.

Regarding the dissemination of education statistics, various international organisations publish education statistics for their member countries.

The UNESCO Institute of Statistics (UIS) monitors progress towards the SDG 4 ***'Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all'*** and acts as custodian for most of the indicators informing the targets of SDG 4. The UIS provides a rich set of internationally comparable data, compiled by the UIS, as well as information from household surveys. UIS statistics are used by diverse partners, including governments, donor agencies and other UN organisations. The UIS is also an important source of education data for UNESCO's 'Global Education Monitoring Report', the World Bank's 'World Development Indicators' and UNDP's 'Human Development Reports'.

Every year, the OECD publishes 'Education at a Glance', which provides comparable data across OECD countries and a number of partner economies. It provides a rich, comparable and an up-to-date array of indicators on systems and represents the consensus of professional thinking on how to measure the current state of education internationally. Education at a Glance presents data on the structure, finances

and performance of education systems and provides key information on the output of educational institutions; the impact of learning across countries; access, participation and progression in education; the financial resources invested in education; and teachers, the learning environment and the organisation of schools.

E.14.4. Analysing data quality and identifying problems

The main education data used at the international level are national administrative data. These data are frequently combined with data from national surveys on educational institutions, compiled and further processed by international institutions. Data quality is fundamental to the credibility of the statistics produced. The quality of these data depends on several factors: the quality of national statistics received, as well as the quality of the internal systems for collection, processing, analysis and dissemination of the data and metadata. In addition, the comparability of education data may be impacted by differences between countries' educational systems.

Each of these factors needs to be adequately addressed in order to obtain quality education statistics. While the first factor depends principally on the country, the second one relies on the relevant international institutions (Eurostat, OECD, UNESCO, World Bank etc.).

At the national level, the quality of education statistics is linked to the adequacy of national data sources and the extent to which international data definitions and guidelines are correctly applied. Hence, the challenges of education statistics at the national level are three-fold:

- A mismatch between the coverage of the national sources and the ISCED definition;
- A difference between the school/academic year to which the statistics refer, the point in time that the data were collected and the date on which the count of students is taken, all of which may, furthermore, differ from the international requirements.
- National data item definitions (e.g., teacher, graduate, programme) and their classifications (e.g., programme level, type of educational personnel) may be different to those required internationally.

Another challenge at the national level may come from the difficulty of comparability of the statistics over time for the following reasons: (i) changes in the educational system (such as the implementation of reforms that lead to an increase in the stock of students); (ii) changes in the coverage of the data collection (inclusion/exclusion of programs etc.); and (iii) changes in the methodology used.

Addressing the above-mentioned challenges is not an easy task and requires the implementation of several actions as follows:

- Ensuring that countries are provided with detailed data definitions and data reporting advice and guidance;
- Allowing for data collection tools to include sufficient disaggregated levels of sub-classifications in areas where it is known to be difficult for countries to provide the required data;

Box E.14.4: The Education statistics Data Quality Assessment Framework

The UNESCO Institute for Statistics (UIS) has been working for several years in Africa on improving the Data Quality Assessment Framework (DQAF) for education statistics. The 'Education statistics Data Quality Assessment Framework' (Ed-DQAF) has been developed by UIS and the World Bank, based on the IMF's generic DQAF structure. The Ed-DQAF is used to diagnose data quality in education, evaluating the quality of countries' production and management systems for education statistics and the decision-making information available on the education sector.

The Ed DQAF identifies practices relevant to assess quality, classifying them into dimensions, sub-dimensions and indicators. The six dimensions span the whole information value chain:

1. **Pre-requisites of quality**
   Evaluation and understanding of the institutional context in which the statistical processes exist and which is essential to the other quality dimensions; how statistical laws, human resources and technical resources impact on other quality dimensions.
2. **Integrity**
   Objectivity in the collection, compilation and dissemination of statistics. This covers institutional arrangements that ensure professionalism in statistical policies and practices, transparency, as well as ethical standards.
3. **Methodological soundness**
   The methodological basis for statistics should be sound, following internationally accepted standards, guidelines and good practices. This is dataset specific, reflecting different methodologies for different datasets. This covers: concepts and definitions; scope; classification/sectorisation; basis for recording.
4. **Accuracy and reliability**
   Whether data give an adequate picture of the education sector in the country. This is dataset specific, reflecting the specificity of the sources and treatments. This covers: source data; statistical techniques; assessment and validation of source data; assessment and validation of intermediate data and statistical outputs; revision studies.
5. **Serviceability**
   To which extent statistics are useful for planning or policy purposes, referring mainly to periodicity, timeliness and consistency.
6. **Accessibility**
   Data and metadata should be presented in a clear and understandable way and should be easily available to users. Metadata should be relevant and regularly updated. Assistance to users should be available, efficient and performed in a reasonable time.

Each practice is scored according to whether it is 'Observed'; 'Largely observed'; 'Largely not observed' and 'Not observed'.

- Providing clear guidance on the reporting of missing data;
- Requesting the data providers, whenever possible, to provide metadata;
- Mapping countries' national educational programs to the ISCED levels;
- Including automated verification checks if the questionnaires are electronic.

E.14.5. Improving sector statistics

There is no rule-of-thumb for building a statistical action in the education sector of any developing country; in other words, each country will have its own challenges, which will need to be addressed accordingly. Nonetheless, the overarching goal of any statistical task in the education sector should be to improve the quality, accuracy and timeliness of the statistics. In most developing countries, Educational Management Information Systems (EMIS) are established to collect, process and analyse statistical data on the educational system to improve planning within the sector and guide the formulation of educational policy reforms. Thus, statistical actions in the sector should focus on strengthening the EMIS in order for the education statistics to meet the requirements of the end-users.

The design and implementation of an effective EMIS are expensive and complex. Thus, it is instrumental to take into consideration the needs of all the groups that will provide and/or use these statistics (Ministry of planning, Finance, regional and district education offices, donors and NGOs). To be effective, an EMIS should be driven by national needs and not donor requirements.

Education statistics provided by any EMIS should be timely and complete in order to ensure a good quality and for the data to be useful. Hence, there is a need to strengthen these EMIS. Several roadmaps can be implemented to improve education data collection. One of these roadmaps consists of the following steps:

1. Ensure the collection and analysis of educational data, as possible.
2. If not in place, establish a data collection unit within the education authority to co-ordinate data collection at all levels.
3. Assess the status of EMIS nationally. Consider any needed improvements and seek assistance as appropriate to strengthen national capacity in this area.
4. Conduct data analysis to produce indicators to guide policy makers and provide recommendations for practitioners to improve the quality of educational provision.
5. Educational authorities should seek, obtain and share statistical data concerning nationals.

Box E.14.5: Suggestions for the estimation of missing data

National data sources are rarely adequate to provide all of the data requested at the international level and missing codes frequently have to be used, hence the need to derive estimates for some of these missing values.

There are broadly five situations in which missing values might arise:

- Data not collected for a variable: It may be possible to generate an estimate by formulating assumptions with data available. For example, if the students' age distribution is not available but the grade distribution is, it is a logical to assume that all students in the same grade are of the same age.
- Data not available for the desired level of aggregation: A feasible approach may be to scale up the sub-national figures to national level using a scaling factor derived from a different, but related dataset. For example, partial student enrolment numbers could be scaled up on the basis of student data from labour force surveys or from the results of an ad-hoc survey.
- Data may be available only for certain sub-populations: Similar to the previous situation where the same potential solution could be applied. For example, certain data may be available for public schools and government-dependent private schools but not for independent private schools and they could be scaled up as described above.
- Data not available for the desired level of disaggregation: For example, expenditures data may not be available for each level of education separately but can be apportioned to the corresponding levels based on student enrolments in the respective levels.
- Data may not be available for the year of the data collection: In this case, it may be possible to estimate the data on the basis of data from previous years.

In all cases, when choosing a technique to estimate missing data, thought needs to be given to the use to which the data will be put, particularly in indicator calculations. For example, using student numbers as a basis for estimating missing expenditure data would be inappropriate if the estimated expenditure data were then to be used calculate expenditure per student.

Specific data items which most commonly require estimation are: (i) Retirement expenditure (particularly in unfunded or partially funded schemes); (ii) Household expenditures on education (these are most commonly derived from national household expenditure surveys); (iii) Private employer expenditure on training of apprentices and other combined school and work-based training programmes.

Source: OECD Handbook for internationally Comparative Education Statistics (2018)

To find out more…

Strategies and programmes

- Sustainable Development Goal 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
- Incheon Declaration: Education 2030: Towards inclusive and equitable quality education and lifelong learning for all
- UNICEF: Data Must Speak initiative
- UNESCO: Education for All (EFA) 2000-2015
- African Union: Continental Education Strategy for Africa 2016-2025 (CESA 16-25)
- Southern African Development Community: Regional capacity building strategy for Educational Management Information Systems (EMIS) (2010)

Methodology

- UNSD: SDG indicators metadata
- UNESCO Institute for Statistics (UIS): ISCED 2011 (levels of education); ISCED-F 2013 (education fields); 'Questions and answers about ISCED 2011'; Glossary of education terms
- UNESCO Institute for Statistics (UIS): Education Indicators. Technical guidelines, 2009.
- UIS-OECD-Eurostat: 'ISCED 2011 Operational Manual: Guidelines for Classifying National Education Programmes and Related Qualifications' (2015)
- OECD: OECD Handbook for internationally Comparative Education Statistics (2018)
- UIS and World Bank: A Framework for Assessing the Quality of Education Statistics (Ed-DQAF)
- UIS and World Bank: Global Age-Specific Literacy Projections Model (GALP): Rationale, Methodology and Software (2006)
- UIS, OECD and Eurostat (UOE): UNESCO-OECD-Eurostat (UOE) joint data collection – methodology
- Education Management Information Systems (EMIS)
- African Union: Continental Education Strategy for Africa 2016-2025 (CESA 16-25): Indicators Manual (2006-2015)
- Asian Development Bank: Administrative data sources for compiling Millennium Development Goals and related indicators (reference handbook on using data from education, health and vital registration systems) (2011)

Data sources

- United Nations Statistics Division (UNSD): SDG indicators database
- UNESCO Institute for Statistics (UIS): Data for the Sustainable Development Goals
- UNESCO: Global Education Monitoring Report
- UIS: UNESCO UIS education survey questionnaires
- UNESCO: Education For All (EFA) Development Index 2000-2015
- World Bank: World Development Indicators
- UNDP: Human Development Reports data
- World Bank: EdStats - Education Statistics Database
- OECD: Online Education Database and Education at a Glance
- UNICEF: Education data
- OECD: Labour statistics
- UNECA: ECA Statistics database - data on education
- United Nations Population Division (UNPD): World Population Prospects
- Eurostat: Online database on education and training
- European Commission: The European Education and Training Monitor

Other surveys and examples

- OECD Programme for International Student Assessment (PISA)
- UNICEF and UNESCO-UIS: Out-of-School Children Initiative (OOSCI) (see also the Operational Manual)
- Trends in International Mathematics and Science Study (TIMSS) and Progress in International Reading Literacy Study (PIRLS) (common website)
- Laboratorio Latino-Americano de la Evaluación de Calidad de la Educación (LLECE)
- Programme d'Analyse des Systèmes Éducatifs (PASEC) des États et gouvernements membres de la CONFEMEN (Conférence des ministres en Education des pays ayant le français en partage)
- The Southern and Eastern Africa Consortium for Monitoring Educational Quality (SEACMEQ)

Resources

- UNESCO: International Bureau of Education (IBE)
- European Commission: Eurydice - European Network for Information in Education
- OECD: Centre for Educational Research and Innovation (CERI)
- International Labour Organization (ILO)
- United Nations Children's Fund (UNICEF)
- International Association for the Evaluation of Educational Achievement (IEA)
- UNESCO International Institute for Educational Planning (IIEP); IIEP-UNESCO Dakar; IIEP-UNESCO Buenos Aires

E.15 Health statistics

E.15. Health statistics

The chapter in brief

This chapter covers the full range of health statistics and their direct uses in indicators such as those of the Sustainable Development Goals (SDG). The relationship between data collection and policy formation provides the introduction and, together with a section on concepts and definitions, provides the motivation.

The chapter covers administrative and survey-based statistics. The difficulties of coordinating health statistics collection and publication are also covered. The chapter proceeds with sections on SDG and other health indicators; health information systems; and health accounts as the frameworks for health statistics integration and use.

An example of the use of administrative and survey health statistics to formulate policy is provided. A checklist to analyse statistical quality is shown. Indicators for improving health statistics are given.

E.15.1. Policy applications: what these statistics are used for

The health statistics presented in this chapter have a variety of uses, notably to:

- Analyse the health situation of the people and identify and quantify health care activities and resources and the causes of death as a basis for policy preparation
- Prepare and monitor sector health programmes
- Manage available health resources efficiently and effectively to obtain measurable and comparable health outcomes throughout a country
- Enable health expenditure to be distributed between regions and population groups so that people can have similar expectations for health and longevity
- Assess the outcome of health policies
- Assess links between health care and social structures to inform social policies
- Assess links between health and individual behaviour to inform public health education
- Respond rapidly and appropriately to serious events
- Quantify, locate and monitor epidemics to provide early warning systems (locally, nationally and globally) and support emergency response
- Provide information to vital statistics (birth and death recording) systems for population statistics (see also chapter E.13 on population statistics)
- Communicate the national health status to international organisations and partners in a timely manner, especially about serious health situations
- Support international comparisons through the Sustainable Development Goals indicators

This list shows that health statistics have a wide range of uses for health and social policies. Timely and relevant statistics are essential to formulate, implement and monitor policy actions. In the absence of this data, it is easy to misdirect limited health funds. In many partner countries, the challenge to meet these policy needs is overwhelming. Other statistics collectors have intervened, such as donor-supported international agencies and charitable organisations. Therefore, an important policy objective regarding health statistics is to ensure effective coordination of the various interventions.

E.15.2. Concepts and definitions

E.15.2.1 OVERVIEW

Health statistics cover a wide range of health-related topics. These include life expectancy, health status, health and safety, health determinants (including lifestyle, nutrition, smoking, alcohol abuse), health resources and expenditure, health care systems, morbidity and mortality (including infant and child mortality), hospital admission, causes of illness and death, national and international reporting of infectious diseases, disabilities, pharmaceutical consumption and sales, health personnel, remuneration of health professionals, environmental health status, health inequality, health finance, health care resources and technology.

The first basic type of health statistics consists of **administrative statistics**. These consist of the records produced while admitting, treating and discharging patients from hospitals, doctors' surgeries and other health centres; and the records produced in the course of the management of health institutions. These include also death data derived from death certificates.

Other health statistics are based on household **health surveys**, directly collecting information about health status and determinants from a random sample of the target population.

As record keeping and data provision to statistics agencies improves, survey-based data tend to be replaced by statistics from administrative sources, which are the preferred data source and are cheaper to collect. However, even in developed countries, health surveys are rarely completely replaced. The two types of data sources are in principle complementary and can be used to validate other results. It is important to develop an **integrated health statistics information system** that draws from all data sources and produces relevant, timely, geographically disaggregated information that is sufficiently accurate to inform policy decisions

This information can take the form of health indicators, such as life expectancy and child mortality and is ideally based on several data sources. However, in partner countries, the data are often based on the results of single surveys, making these critically important to decision making. The best-known indicator set consists of the **SDG indicators**.

The **System of Health Accounts** has been developed to analyse the adequacy of resource levels for health care and the way that those resources are used.

Box E.15.1: Classifications and nomenclatures relevant to health statistics

The International Classification of Diseases (ICD-11) is the standard to categorize diseases.

The World Health Organization (WHO) has developed a 'Handbook on Monitoring and Evaluation of Human Resources for Health' and several other tools for monitoring and developing human resources for health (HRH). WHO uses nine occupational categories for the health workforce (18 occupational categories are available for some countries, differentiating some categories according to skill level and specialization).

The International Classification for Health Accounts (ICHA), developed by the OECD for the System of Health Accounts (SHA), covers three dimensions of health care:

- Health care functions (ICHA-HC)
- Health care service providers (ICHA-HP)
- Health care financing schemes (ICHA-HF)

Please see the section 'To find out more' for external hyperlinks.

E.15.2.2 ADMINISTRATIVE DATA ON HEALTH

Administrative data on health consist of all the data that are regularly collected by hospitals and other health facilities. It covers

- data on the available beds and other medical facilities;
- the numbers of doctors and paramedical staff;
- the numbers of patients admitted, treated and discharged;
- hospital activities performed, such as number of surgeries, number of preventive services etc.; and
- records of births and deaths within health facilities.

Records of cases of notifiable diseases and health situations are also included.

These data are usually reported to the Ministry of Health or a similar agency to provide information on health issues and for management purposes.

Health facility assessments cover the number of hospital beds and other health facilities in use. These data are often collected annually, since changes are comparatively rare. Health staff numbers are also collected and classified: the numbers of doctors, dentists, nurses, paramedical staff, community health workers, pharmaceutical personnel and so on.

Hospitals and other health facilities maintain records of consultations / inpatient admissions, medical condition according to classification, length of stay and discharge.

Surveillance (sentinel) systems monitor the occurrence of specific medical conditions to assess the stability or change in health levels of a population. The resulting statistics permit the study of disease rates in a specific cohort, geographic area, population subgroup etc., and the estimation of trends in the larger population. The WHO International Health Regulations (IHR) require notification of health events defined by specific diseases and according to a set of criteria.

Biometric information and patient history information collected systematically from patients can be considered as part of the heath administrative dataset.

The civil register and vital statistics system, based on the register of births and deaths, or on death certification, is a primary source of administrative information on cause of death. However, this data source is rarely reliable in partner countries (see also chapter F.18 on Government finance and public sector statistics). Records of births and deaths in health facilities, especially hospitals, may be more reliable but cannot be used by themselves as unbiased indicators for the whole population, since home births need to be included[1]. While registered births may be more complete than deaths, some partner countries have facilities to register births retrospectively at school entry age, meaning that data on preschool age children are incomplete.

Health facility expenditure data, the source of financing of treatment and of facilities are key components of the national health accounts. This information may be drawn from administrative data sources, such as hospital financial records. National Health Accounts are discussed below.

Administrative health data are often combined with data from other sources, notably population data, to obtain indicators based on ratios. These ratios include number of doctors, community health workers or hospital beds available per 10 000 or 100 000 population, nationally or within a province / region or health district. Health indicators may also be derived from combining two administrative data series, such as percentage hospital bed occupancy.

Outside EU and OECD countries, administrative data on health are often primarily collected by routine health information systems for current treatment and management of health facilities. Since the data are not collected for statistical analysis, data definitions may not follow current standards and classifications, leading to problems in using these data for health statistics. Public health reporting systems may underreport infectious diseases and private institutions may not report at all. Transmission of data may not be consistent or timely.

In recent years, private health facilities in many partner countries have greatly increased in number and in the range of treatments offered, from pharmacies through to hospitals. Facilities supported and organised by external non-governmental organisations may also consider themselves as operating outside the national health system. Data collection from these facilities may be difficult. Such difficulties were observed during data collection for Malawi's national health accounts, discussed in box E.15.3 further below.

Health district boundaries may differ from provincial/regional boundaries and geo-location data may be insufficient to compensate for boundary differences. The basic population data at administrative or health district level may be incompatible with the administrative health data and may require adjustment. To enable health records held by multiple

1 See the Euro-Peristat website and associated scientific papers.

health facilities and agencies to be incorporated into health statistics, health information systems at local level need to access data from all sources. Health information systems are considered at greater length below.

The problem of overcoming the incompatibility of disparate data sources is more likely to be addressed at national level through an **integrated health statistics system**, although Ministry of Health officials may not have the skills to compile and validate the basic statistics nor to calculate indicators. In addition, the National Statistical Office (NSO) and Health Ministry may produce 'competing' publications.

Maintaining **geographical disaggregation** in national health statistics publications is important to ensure equity and to identify populations at risk. District health information systems support the collection of local data.

The WHO World Health Statistics provide detailed definitions of the health related data series that are collected from national agencies, usually Ministries of Health, and used in its own publications. The preferred data sources and alternatives to them are identified.

Statistical analysis, particularly epidemiology, is a major use of administrative data. If these data are not timely, sufficient or correctly collated, such analysis is not possible. Demands for increased statistical collection are both continuous and costly, both in partner countries and in developed countries. Nevertheless, examples of the successful analytic exploitation of administrative health data can easily be found[2]

E.15.2.3 SAMPLE SURVEYS ON HEALTH

International household and other population-based sample surveys generally include a major health component. The survey methodology should be incorporated into national practice, so that the results of a nationally organised survey can be interpreted correctly and are internationally comparable. A major survey is ideally conducted once every five years. An interim survey is sometimes conducted, often considering a specific issue and providing updated data.

- Demographic and Health Surveys (DHS) aim to collect and disseminate accurate, nationally representative data on fertility, family planning, maternal and child health, gender, HIV/AIDS, malaria, and nutrition. The AIDS Indicator Survey, Malaria Indicator Survey and other types of survey are also carried out by the DHS Programme.
- The WHO World Health Survey Plus modular system of health surveys aims to address critical data gaps.
- Multiple indicator cluster surveys (MICS) are supported by UNICEF which assists countries in collecting and analysing data on the situation of children and women. The MICS aim at enabling countries to produce statistically sound and internationally comparable estimates of a range of indicators on topics that include fertility, mortality, contraceptive use, unmet needs, maternal and new-born health, female genital mutilation, menstrual hygiene management, child illness and treatment, and child development and nutrition, among others. The current survey round, MICS7, was launched in March 2023. MICS6, carried out during the period 2017-2021, focused on coverage of the Sustainable Development Goals, key frameworks such as WHO's Every Newborn Action Plan, and emerging child and adolescent issues including the use of technology, literacy skills and child functioning. MICS survey questions and modules are harmonized with DHS to ensure a coordinated approach to survey implementation and to provide comparability across surveys.
- The World Bank Living Standards Measurement Study (LSMS) multi-purpose survey collects data on many dimensions of household and individual wellbeing to assess household welfare, understand household behaviour and evaluate the effect of various government policies on the living conditions of people in partner countries. The LSMS Plus programme assists selected partner countries in collecting individual-disaggregated survey data on asset ownership and employment, following the latest international guidelines. Many recent LSMS surveys have omitted or greatly reduced the survey sections related to health.
- The population census (see chapter E.13 on population and migration statistics) is sometimes used to analyse health questions, notably death rates and causes of death. Although a useful source of data, the population census has a low frequency, usually once every ten years. Limitations on the census arise from a limited number of health questions, due to cost, and inherent difficulties in accurately recalling the dates of births and deaths.

The Inter-secretariat Working Group on Household Surveys, sponsored by the UN Statistical Commission, has operated since 2015 to improve statistics based on household surveys through coordination and cooperation between international agencies and NSOs. Its task forces cover sector statistics, including health statistics. Further information can be found in relation to the Cape Town Global Action Plan for Sustainable Development Data.

Much of the current developments in household surveys are concerned with

- methodological improvements;
- the effective application of technology to surveys;
- improving coordination with other data sources; and
- utilising innovative data sources and data collection methods in relation to household surveys, for example the high frequency telephone surveys used for LSMS during the COVID-19 restrictions.

These issues also affect Living conditions and poverty statistics (see chapter E.12 on living conditions and poverty statistics).

2 For example, Hanna, T. P., Kangolle, A. C. T. (2010) Cancer control in developing countries: using health data and health services research to measure and improve access, quality and efficiency, BMC Int Health Hum Rights, 10, 24.

E.15.2.4 CONSOLIDATION: HEALTH INFORMATION SYSTEMS

Health data from administrative sources and surveys can provide different results. A means of coordination and consolidation is required to confront the various data sources, identify potential errors, and ensure the data follow common concepts and classifications, especially geographical boundaries in order to produce reliable statistics at local and national levels.

An integrated health information system (HIS) collects and disseminates data from and to local health offices to deliver a consistent indicator set that can be used to monitor health outcomes, resources and finance, as well as develop and implement a sector health strategy at national and local levels. Effective coordination among statistics producers and users is the key element.

The case for investing in integrating or updating a health information system is that the information produced will enable scarce health resources to be directed in appropriate amounts to activities and locations where they are most needed. Management of the health system is the primary objective; the production of statistics is essential to this objective.

A health information system aims to produce and disseminate a comprehensive local and national picture of the current health situation and its development. Coverage should highlight immediate health priorities. The system should transmit health statistics that follow international standards to the relevant regional and global organisations in a timely manner, in particular on reportable diseases. The health information system should be sustainable, both technically and in terms of human resources. A health information system is almost inevitably a collection of disparate and potentially incompatible software packages, as well as manual elements. It is essential to avoid duplicate systems, especially electronic and paper-based ones, since neither will be complete. Implementing or upgrading a HIS is therefore also a system integration project.

Health statistics are produced from administrative sources, early warning / sentinel systems on notifiable infectious diseases, household surveys and civil registration and vital statistics systems. Data from externally financed surveys that are not integrated into the national survey programme also need to be incorporated into a health information system, as do data drawn from private health facilities. The system may also incorporate financial, health insurance, medical laboratory, logistics and supply, infrastructure, and human resources information. The standards used, for example classifications of diseases, need to be compatible between various types of data sources. Geographical definitions also need to be aligned. Health districts often do not coincide with the regional or provincial boundaries that are used to report survey results because health districts are often designed to reflect the catchment area (current or historic) of a hospital or other health facility. A Geographical Information System (GIS) is often used to link locations to geographical classifications.

WHO identifies the scope of a health information system:

'The range of sources for health-related data comprises service-generated data, disease and behavioural surveillance, civil registration and other sources of vital statistics, financial and management information, household surveys, health-facility surveys, censuses, modelling, estimates and projections, and research. Each source has its own strengths and weaknesses when generating health information.'[3].

In administrative terms, the Ministry of Health, a related agency or local authorities usually collect administrative data, while survey statistics are usually the responsibility of the NSO. Effective communication and a clear and agreed division of responsibilities between the organisations may require a formal coordination agreement. The minimum aim is to publish a single set of data on each topic, then to ensure that data from different sources are published using the same standards and classifications, so that they are comparable at the national level. Achieving this level of commonality needs to account for changing health issues and standards.

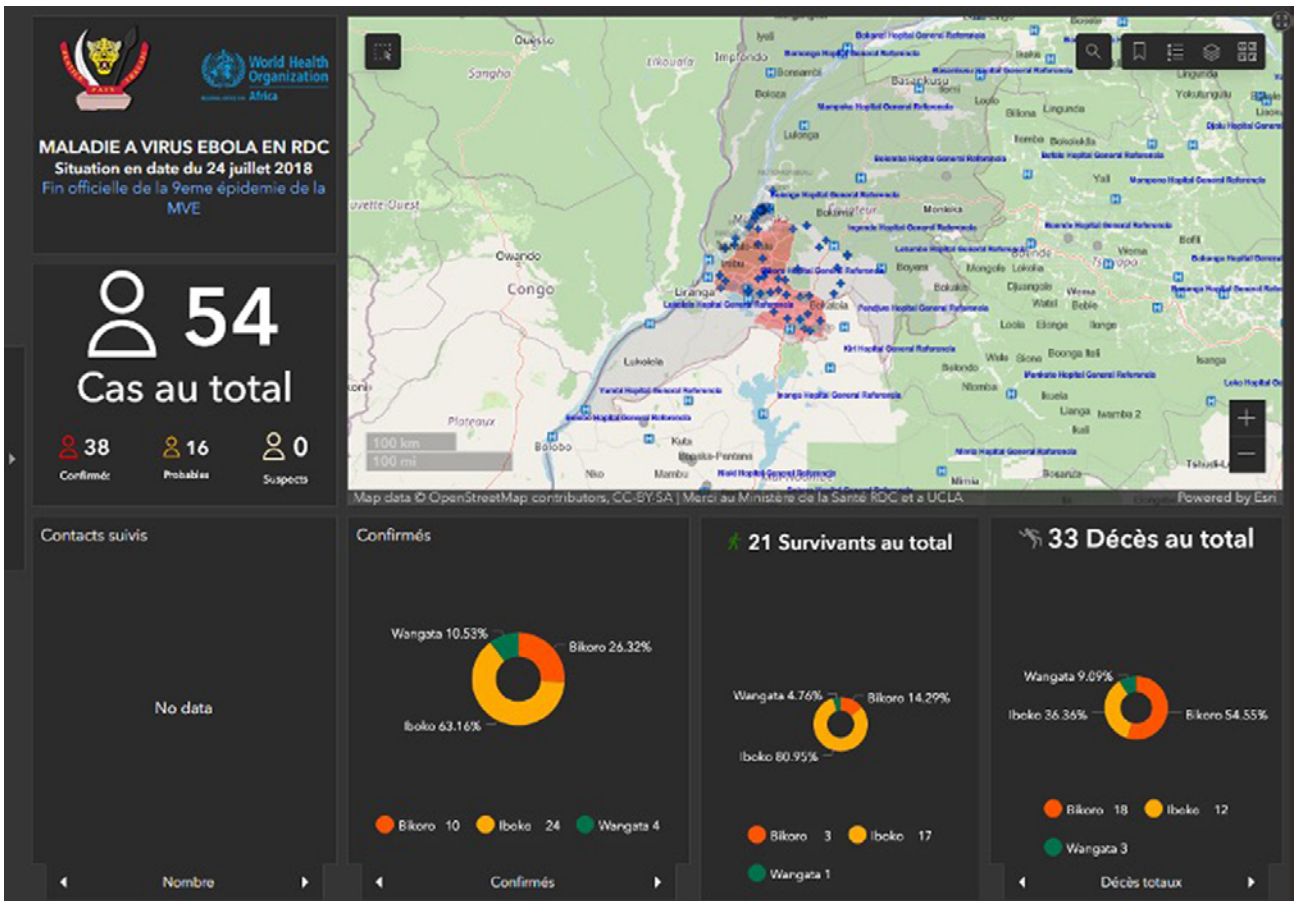
The information required for health facility and sector management is more detailed and more frequent than that required for official statistics. To take an extreme example, during an epidemic, near-real time information on medical supplies, hospital capacity and personnel availability is essential in core facilities, while, during the 2020 COVID-19 pandemic, at least some partner countries managed to produce daily data bulletins. Similarly, the WHO produced a GIS dashboard based on daily case data from the 2018-2020 Ebola outbreak in Democratic Republic of the Congo, as shown in Figure E.15.1.

The statistics derived from a health information system needs to present information from different sources consistently. Information needs to be available at national or at area level – the locality or area needs to be clearly defined by administrative boundaries, health districts or both. Data should be as up to date as users reasonably require. The need for consistency and to communicate with international organisations and partners means that the statistics presented must be compatible with international standards.

The resources and coordination required to construct or renew a health information system are such that any development action should be included in a National Strategy for the Development of Statistics in order to ensure political support, develop common goals across institutions and ensure professional commitment. Staff at all levels will need to be trained to understand and use the system; a permanent training mechanism is likely to be needed.

3 WHO: Framework and standards for country health information systems, 2nd ed

Figure E.15.1 Health Information System derived dashboard for Ebola outbreak, Democratic Republic of the Congo



The World Health Organisation's website proposes a range of resources to build and maintain the non-IT elements of a health information system, as well as a common monitoring and evaluation framework:

- Classification and indicators
- Data collection and measurement
- Data quality and analysis
- Analytical and statistical reports
- Country monitoring and evaluation
- Monitoring universal health coverage.

E.15.2.5 HEALTH INDICATORS AND THE SDGS

Health indicators provide the means to observe and analyse health status at national and local level, to manage health facilities and the health sector as a whole, and to inform the public. Most are derived from health sector statistics. Their coverage, whether from an integrated national health information system, as discussed in the previous section or otherwise, should include:

- Accessibility: such as distance to health facility
- Availability: ratios of health and social facilities and doctors to population, ratios of doctors and other health professional to hospital beds
- Coverage: vaccination, attended births
- Health status: morbidity and mortality rates

The purpose of the Sustainable Development Goals health indicators is to provide internationally comparable data to measure progress towards the 2030 Agenda for Sustainable Development. Data, definitions, methodologies and sources on the SDG indicators can be found at the Sustainable Development Goals indicators website. This was developed by the Inter-Agency and Expert Group on SDG indicators (IAEG-SDGs) and coordinated by the United Nations Statistics Division.

As with other SDG indicators, data on the global website may not match national data on the same indicators. This situation can arise for a variety of reasons. These include delays in transmitting data and metadata, non-acceptance of the survey methodology by the global agency, differences in indicator definition and methodology, and adjustments made by global agencies in the interest of comparability. In this situation, conflicting viewpoints often arise. It is usually necessary to analyse the difference in each indicator on a case-by-case basis. In some situations, there is no resolution, since the country can make a good case that its own indicator definition better represents the evolution in the SDG target. At the same time, the global agency is required to ensure comparability between countries.

A good presentation of child health statistics in the context of these indicators can be found in the presentation of the late Hans Rosling to the 2010 TEDxChange conference – for link, see 'To find out more'. This illustrates both the use of comparable international indicators and the potential conflicts between national survey results and international comparability.

The following box presents the SDG health-related goals, targets and indicators, together with some surveys that potentially can be used as data sources. This table is based on an initial analysis performed in 2006, updated to reflect recent developments in the methodology and scope of these surveys.

Box E.15.2: Policy areas in the 2030 Agenda for Sustainable Development and related targets and indicators relevant to crime and criminal justice statistics

	IS/ LSMS	DHS	MICS	PC
Goal 3: Ensure healthy lives and promote well-being for all at all ages				
Target 3.1: By 2030, reduce the global maternal mortality ratio to less than 70 per 100,000 live births				
3.1.1 Maternal mortality ratio	◉	●	●	●
3.1.2 Proportion of births attended by skilled health personnel	○	●	●	○
Target 3.2: By 2030, end preventable deaths of newborns and children under 5 years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1,000 live births and under-5 mortality to at least as low as 25 per 1,000 live births				
3.2.1 Under-five mortality rate	◉	●	●	●
3.2.2 Neonatal mortality rate	◉	●	●	●
Target 3.3: By 2030, end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable diseases				
3.3.1 Number of new HIV infections per 1,000 uninfected population, by sex, age and key populations	○	◉	○	○
3.3.2 Tuberculosis incidence per 1,000 population	◉	○	○	○
3.3.3 Malaria incidence per 1,000 population	◉	◉	○	◉
3.3.4 Hepatitis B incidence per 1,000 population	○	○	○	◉
3.3.5 Number of people requiring interventions against neglected tropical diseases	◉	○	○	◉
Target 3.4: By 2030, reduce by one third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being				
3.4.1 Mortality rate attributed to cardiovascular disease, cancer, diabetes or chronic respiratory disease	◉	◉	○	○
3.4.2 Suicide mortality rate	○	○	○	○
Target 3.5: Strengthen the prevention and treatment of substance abuse, including narcotic drug abuse and harmful use of alcohol				
3.5.1 Coverage of treatment interventions (pharmacological, psychosocial and rehabilitation and aftercare services) for substance use disorders	○	○	○	○
3.5.2 Alcohol per capita consumption (aged 15 years and older) within a calendar year in litres of pure alcohol	○	◉	○	○
Target 3.6: By 2020, halve the number of global deaths and injuries from road traffic accidents				
3.6.1 Death rate due to road traffic injuries	○	○	○	○
Target 3.7: By 2030, ensure universal access to sexual and reproductive health-care services, including for family planning, information and education, and the integration of reproductive health into national strategies and programmes				
3.7.1 Proportion of women of reproductive age who have their need for family planning satisfied with modern methods	○	●	●	○
3.7.2 Adolescent birth rate (aged 10-14 years; aged 15-19 years) per 1,000 women in that age group	◉	●	●	●
Target 3.8: Achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all				
3.8.1 Coverage of essential health services	◉	●	●	●
3.8.2 Proportion of population with large household expenditures on health as a share of total household expenditure or income	○	○	○	○

	IS/ LSMS	DHS	MICS	PC
Target 3.9: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination				
3.9.1 Mortality rate attributed to household and ambient air pollution	○	◉	○	○
3.9.2 Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene	○	◉	○	○
3.9.3 Mortality rate attributed to unintentional poisoning	○	○	○	○
Target 3.a: Strengthen the implementation of the World Health Organization Framework Convention on Tobacco Control in all countries, as appropriate				
3.a.1 Age-standardized prevalence of current tobacco use among persons aged 15 years and older	○	◉	◉ (1)	○
Target 3.b: Support the research and development of vaccines and medicines for the communicable and non-communicable diseases that primarily affect developing countries, provide access to affordable essential medicines and vaccines, in accordance with the Doha Declaration on the TRIPS Agreement and Public Health, which affirms the right of developing countries to use to the full the provisions in the Agreement on Trade-Related Aspects of Intellectual Property Rights regarding flexibilities to protect public health, and, in particular, provide access to medicines for all				
3.b.1 Proportion of the target population covered by all vaccines included in their national programme	◉	●	●	○
3.b.2 Total net official development assistance to medical research and basic health sectors	○	○	●	○
3.b.3 Proportion of health facilities that have a core set of relevant essential medicines available and affordable on a sustainable basis	○	○	○	○
Target 3.c: Substantially increase health financing and the recruitment, development, training and retention of the health workforce in developing countries, especially in least developed countries and small island developing States				
3.c.1 Health worker density and distribution	◉	○	○	○
Target 3.d: Strengthen the capacity of all countries, in particular developing countries, for early warning, risk reduction and management of national and global health risks				
3.d.1 International Health Regulations (IHR) capacity and health emergency preparedness	◉	○	○	○
3.d.2 Percentage of bloodstream infections due to selected antimicrobial-resistant organisms	○	○	○	○

Key:
● Indicator can be measured with this survey
◉ Indicator can be measured with this survey but changes to methodology may be required
○ Indicator would not normally be measured with this survey

IS/LSMS	Integrated Survey / Living Standards Measurement Study (World Bank)
DHS	Demographic and Health Survey (USAID) – includes AIDS Indicator Survey
MICS	Multiple Indicators Cluster Survey (UNICEF)
PC	Population and Housing Census

Sources: Intersecretariat working group on household surveys

1 MICS6 covers 'Number of women aged 15-49 years who smoked cigarettes or used smoked or smokeless tobacco products at any time during the last one month'. Source: UNICEF: MICS List of Indicators

E.15.2.6 EXPENDITURE ON HEALTH: SYSTEM OF HEALTH ACCOUNTS

The purpose of the System of Health Accounts (SHA) is to analyse the adequacy of resource levels for health care and the way that those resources are used in order to answer questions such as:

- What are the main drivers accounting for health expenditure growth?
- How are changes in the structure of health spending and performance of health systems related?
- What factors explain the observed differences between countries?
- What are the main structural differences in health spending between countries?

The core methodological manual is 'A System of Health Accounts 2011' (SHA 2011), developed by OECD, Eurostat and WHO, which revises and unifies earlier approaches. This defines the function and purposes of the SHA as follows:

'Health accounts provide a systematic description of the financial flows related to the consumption of health care goods and services. Their intent is to describe a health system from an expenditure perspective. But as more countries implement and institutionalise health accounts, there are increased expectations from analysts, policy makers and the general public alike for the more sophisticated information that can be gained through the greater volume of health

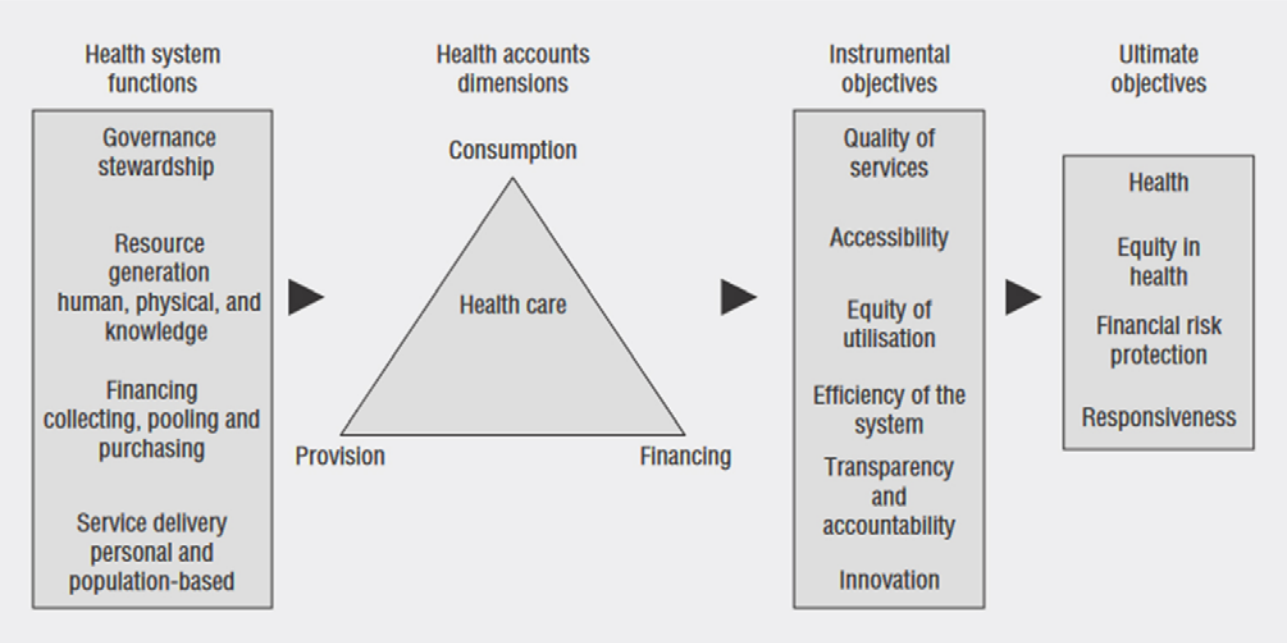
expenditure data now available. Health accounts are increasingly expected to provide inputs (along with other statistical information) into improved analytical tools to monitor and assess health system performance.'

SHA 2011 provides a standard for classifying health expenditures according to the three axes of consumption, provision and financing. It gives guidance and methodological support in compiling health accounts. More specifically, the purposes of the System of Health Accounts 2011 are:

- to provide a framework of the main aggregates relevant to international comparisons of health expenditures and health systems analysis
- to provide a tool, expandable by individual countries, which can produce useful data in the monitoring and analysis of the health system
- to define internationally harmonised boundaries of health care for tracking expenditure on consumption

In order to pursue these purposes, SHA 2011 provides the basis for collecting, cataloguing and estimating all the monetary flows related to health care expenditure.

Figure E.15.2: Linkage between the frameworks of health systems and health accounts



Source: System of Health Accounts (SHA), OECD / Eurostat / WHO, 2011

Figure E.15.2, taken from SHA 2011, links health system functions, the three dimensions or 'axes' of the health system accounts, the instrumental objectives and the system's ultimate objectives.

The SHA proposes three core classifications covering the dimensions of Consumption (goods and services), Provision (producers of goods and services) and Financing (who pays). These are:

- Health care functions (HC)
- Health care providers (HP)
- Financing schemes (HF)

Other classifications that together compose the International Classification for Health Accounts (ICHA) are the classifications of:

- Revenues of health care financing schemes (FS)
- Factors of health care provision (FP)

The System of Health Accounts establishes a basis for health statistics reporting that is compatible with other economic and social statistics, in particular the System of National Accounts (SNA, see chapter F.17).

Some further links are also possible between the health accounts and other data sources such as:

- beneficiaries characteristics: age, gender, disease, socioeconomic characteristic or region
- human resources in health care using ISCO 2008 (see section B.5.2.7)
- health care products

This system supports analysis of funding flows by disease and by intervention clusters. Eurostat's main health statistics datasets do not cross these data sources with the health accounts. The OECD provides some data on expenditure by disease, age and gender under the System of Health Accounts (SHA) Framework.

The World Health Organisation health accounts website also provides health accounts production and analysis tools, training materials, a Global Health Expenditure Database (GLED), a documentation centre that covers global and regional reports on health expenditure, and national health accounts reports.

As shown in the case study in the following box, implementing a system of health accounts in Malawi required the analysis of health statistics from all sources and demonstrates the difficulties in obtaining and comparing data.

Box E.15.3: Successive reports on health financing in Malawi from National Health Accounts

These successive reports summarise Malawi national health accounts exercises, covering respectively financial years 1998/99 to 2005/06, 2012/2013–2014/2015, and 2015/16 to 2017/18. Each report describes the flow of funds and their uses in the health system and derives policy recommendations relevant to developing health financing policy and successive strategic plans. Methodology was based on SHA 2011 and predecessor documents. Household data were drawn from LSMS integrated household surveys. Health facility data were drawn from a questionnaire rather than directly from an integrated health information system but were prepared using the National Health Accounts Production Tool available from the WHO website.

The studies describe the data sources used in the National Health Accounts exercises:

- The data sources were similar across all three reports, including public sector institutions providing and receiving health funds and providing health care goods and services. In the 2020 report, the questionnaire was sent to '146 nongovernmental organizations (NGOs), 130 large employers, 28 district councils, 27 donors, 10 ministries, departments, and agencies, and 6 health insurance companies.' These last provided data on employer and employees premium contributions.
- Employers and employees in Malawi contribute to health expenditures through provision of on-site health facilities, reimbursements to employees, employer/employee contribution to an outside health insurance scheme, and in-house health insurance scheme.
- The 2010 study surveyed selected providers by different levels of care, ownership, and region. It was carried out to collect information on utilization of services. Surveys covered HIV/AIDS, reproductive health and child health (children aged 0-5 years) and expenditure figures by source of finance/financing agent and function. The 2020 report utilised the 2016/17 integrated household survey and estimates from the Institute for Health Metrics and Evaluation, themselves based on the 2010 'Malawi National STEPS Survey for Chronic Non-Communicable Diseases and their Risk Factors'.
- Household out-of-pocket health expenditure was derived for each report from recent national integrated household surveys. For the 2020 report, this survey was carried out in 2016/17.
- A 'People Living with HIV/AIDS' (PLWHA) survey was conducted for the 2010 study, targeting confirmed HIV positive persons in Malawi aged 15 years and older at the time of the survey. The major types of information obtained included utilization of health care services, household assets and expenditures for inpatient and outpatient care. Location sampling was used to identify the target population; those identified for the survey were: (a) PLWHA receiving anti-retroviral drugs in health centres and hospitals; and PLWHA receiving prevention of mother-to-child transmission treatment. A sample of 900 individuals throughout the country was selected. The 2016 study re-interviewed the National AIDS Commission. The 2020 study referenced the 2016 World Bank 'Policy Brief: Improving the Allocative and Technical Efficiency of Malawi's HIV Response'.

The 2010 study noted that data sources often provided conflicting data, requiring value judgments to be made. The response rate from donors and NGOs was poor and other sources were used to estimate their spending. Essential data on outpatient visits and inpatient admissions data by disease and facility type were unavailable in the national Health Management Information System (HMIS). Indicators such as bed occupancy rates, average length of stay, bed turnover rates, utilization by age, gender, type of facility-central hospital, district hospital, health centres are not reported to HMIS. It did not contain data by private-for-profit health sector.

The 2010 study also noted that funding and health services delivery were integrated at health facility level, making it difficult for providers to disaggregate expenditures by source, function (curative, rehabilitative, ancillary services etc.) and disease type, e.g., HIV/AIDS. Most for-profit facilities were unwilling to provide expenditure and revenue data. Data on reported cause of morbidity or care seeking, number of bed days, discharge etc. were available in patient registers but were in a poor state.

Policy prescriptions in each of the reports included a recommendation to increase spending on preventative measures, as being more cost-effective.

Sources:

Zere, E., Walker, O, Kirigia, J., Zawaira, F. Magombo, F. and Kataika, E. (2010) Health financing in Malawi: Evidence from National Health Accounts, BMC International Health and Human Rights, 10, 27

Malawi Ministry of Health: Malawi National Health Accounts Report 2012/2013–2014/2015 (2016)

Malawi Ministry of Health: Malawi National Health Accounts – A Summary Brief of Fiscal Years 2015/16, 2016/17 and 2017/18 (2020)

E.15.3. Sources of data and metadata

The World Health Organisation is the primary global source for comparable health data. The data website provides data by country and by indicator. Highlighted issues are health coverage, health emergency statistics and data on health and well-being. In addition to World Health Statistics Report, the website provides SDG indicator values and a visual dashboard on progress. World Health Survey data are available. WHO data are compiled to ensure data comparability, so that its statistics might not replicate data from national sources. There may also be delays in transmitting and compiling new data received from national sources.

The organisations mentioned above when discussing household surveys provide libraries of the country surveys undertaken using their methodologies. Demographic and Health Surveys and related surveys cover most partner countries. This is a primary resource for country level health data. The UNICEF website provides statistics from the Multi-Indicator Cluster Surveys (MICS) and other data related to child and maternal health. In addition to the World Bank general databank on health, nutrition and pollution statistics, survey reports and microdata from the Living Standards Measurement Study (LSMS) are also available. The UN Statistics Division provides datasets from population censuses.

The Health Metrics Network provides the Global Health Data Exchange, which is a source of global health data and in particular a repository of household surveys.

Current values for comparable SDG indicators can be found at the UN Statistics Sustainable Development Goals indicators website.

Eurostat's health statistics provide a guide to the types of data and indicators that can be made available. Eurostat provides health care expenditure statistics as well as non-monetary data on health care employment and physical and technical resources. The box below summarises Eurostat's main health statistics datasets and publications as a guide as to what can be made available.

Box E.15.4: Eurostat health statistics

The objective of the Eurostat health statistics is to ensure data of high quality and comparability for evidence-based policy decisions at EU level. The statistics on health status, health determinants, health care, disability, causes of death, and health and safety at work are presented as datasets and pre-defined data tables.

The 'Statistics Explained' article 'Healthcare expenditure statistics' presents data according to the three core classifications used in the System of Health Accounts: who pays (financing agents); for which goods and services (functions of health); and who produces these services (providers).

Eurostat health statistics have the following main sources:

- The joint OECD-Eurostat-WHO Health Accounts (SHA) Data Collection provides annual data on health care expenditure, compiled according to the System of Health Accounts (SHA) methodology
- The joint OECD-Eurostat-WHO-Europe data collection on Non-Monetary Health Care Statistics provides annual data on health care resources and most of the data on health care activities (hospital discharges and length of stay, medical procedures, selected preventive services and consultations)
- Annual Causes of Death statistics provide information on all deaths in the population relating to an underlying cause of death. Therefore, the risks associated with death from a range of specific diseases and other causes can be assessed.
- Annual Accidents at work statistics provide data on occupational accidents that result in at least four calendar days of absence from work, including fatal accidents.
- The annual pilot data collection on occupational diseases provides data on recognised cases of occupational diseases. The data reflect not only the occurrence of such diseases, but also the way in which the concept of occupational disease has been integrated into the national social security systems.
- EU Statistics on Income and Living Conditions (EU-SILC) provide annual data on unmet needs for medical and dental care
- European Health Interview Survey (EHIS) provides data for some health care activities: self-reported use of hospital services, consultations, preventive services and use of medicines. Survey rounds were carried out in 2014 and 2019/2020. Until 2019, the survey was conducted every five years. As of 2019 onwards, the survey has a six-year periodicity.

The European Centre for Disease Control (ECDC) is an EU agency aimed at strengthening Europe's defences against infectious diseases. The core functions cover a wide spectrum of activities: surveillance, epidemic intelligence, response, scientific advice, microbiology, preparedness, public health training, international relations, health communication, and the scientific journal Eurosurveillance.

ECDC collects, analyses and disseminates surveillance data on 56 communicable diseases and related special health issues. Surveillance data collected at the European level are predominantly case-based and comprise demographic, clinical, epidemiological and laboratory information. Indicator-based surveillance consists of systematic collection, analysis, interpretation and dissemination of structured information ('indicators') for public health action. ECDC's goal is for infectious disease surveillance in EU/EEA to provide relevant data for the effective prevention and control of infectious diseases while minimising the burden on the Member States.

The European Cancer Information System (ECIS), operated by the Joint Research Centre (JRC) of the European Commission, provides the latest information on indicators that quantify cancer burden across Europe. It permits the exploration of geographical patterns and temporal trends of incidence, mortality and survival data across Europe for the major cancer entities. Its purpose is to support research as well as public-health decision-making in the field of cancer and to serve as a point of reference and information for European citizens. Incidence and mortality historical data and current estimates are provided, as are estimated indicators of survival, by cancer sites and sex, across European countries and regions.

The OECD health statistics section of OECD.Stat covers:

- Health expenditure and financing
- Health Status
- Non-Medical Determinants of Health
- Health Care Resources
- Health Workforce Migration
- Health Care Utilisation
- Health Care Quality Indicators
- Pharmaceutical Market
- Long-Term Care Resources and Utilisation
- Social Protection
- Demographic References
- Economic References

Its Health at a Glance publication compares key indicators for population health and health system performance across OECD members, candidate and partner countries. It highlights how countries differ in terms of the health status and health-seeking behaviour of their citizens, access to and quality of health care, and the resources available for health.

E.15.4. Analysing data quality and identifying problems

Although health statistics may be of better quality than those for other sectors in partner countries, this is because the immediate availability of good quality health statistics for urgent decision can directly be a question of life and death. Data quality depends, among other issues, on the coverage, the timeliness of the published figures and their compliance with the agreed methodology (see section C.5.3). For data comparison and cross-country analysis, international standards and classifications should be respected.

The potential problems with health surveys are the same as social surveys generally. The most common problem is a lack of timeliness: the data take too long to collect, process and publish, so that the data are no longer current when it finally appears. This is often the result of a poorly planned survey. Common problems include:

- Logistics problems: slow sending out and return of questionnaires
- Questionnaire design gives rise to coding problems
- Data entry and validation is not matched to questionnaire arrival
- Limited or absent statistical analysis
- Insufficient budget exists to disseminate the results

A badly drawn sample often is coupled with an excessive sample size at province / regional level and for target groups, resulting in too high survey costs. The number of people who are able to design an efficient and effective sample is often limited in partner countries. One good indicator of a well-designed sample is a clear methodological text.

In administrative health statistics in partner countries, problems may include some or all of the following:

- Non-adoption of current international definitions and classifications
- Incomplete returns from health facilities, especially private companies and in particular concerning notifiable illnesses
- Insufficient process management to ensure timely and full data coverage
- Key indicators not calculated
- Limited and late publication of basic tables without analysis
- 'Competitive' publications of different data for the same series
- The fundamental problems are usually:
- Lack of capacity to manage data collection and processing effectively
- Lack of capacity to identify, prepare, present and analyse key indicators
- Lack of formal coordination between the health and statistics institutes

Coverage of the private health sector, such as clinics and pharmacies, is also of considerable importance for the completeness and information value of the statistics. This

requires an effort to explain the need for and the use of the statistics, and the safeguards put in place to protect respondents. Achieving a good quality response from the sector will also usually require the existence of effective sanctions for non-response.

The difficulties in integrating data from different sources into a health information system should not be minimised. A key quality issue is that the organisation responsible for its management, whether the NSO or the health ministry or agency, at least implements basic credibility and consistency checks on the data between different sources. Classifications, methods and coverage should be compatible between the organisations that collect these different data or else the means to pass from one classification to another should be developed.

Externally financed surveys that are not integrated into the national programme complicate the situation further (even though they may use NSO resources to carry out the survey). The epidemiological and/or social justification for such surveys may mean that they cover only a part of the country. The geographical units used may not match regional / provincial boundaries and there may be little or no attempt to improve statistical capacity. On the other hand, the resulting data may be more accurate and timely than official figures. From the perspective of the organisation carrying out the survey – especially if the funds are charitable donations – the survey can only be carried out cost-effectively if it focuses on the target region. Their responsibility is to produce an analysis to address their mandated priority issues and not address general health statistics issues for the nation. Such organisations may make efforts to coordinate with Ministry of Health and NSO officials but may not be prepared to make a costly effort to do so. At worst, this lack of coordination can result in non-comparable data being published outside of the country concerned and not being readily accessible for purposes other than the direct objectives of the survey.

E.15.5. Improving sector statistics

The key sector objective is to produce a consistent set of health indicators that can be used to monitor a health system and so plan and implement a sector health strategy at national and local level. These data are ideally obtained through the development of an integrated health information system and analysed using national health accounts. The usual major difficulty is in coordinating the various health statistics producers and users around a common system that uses international statistical standards and classifications and common geographical boundaries. This approach can provide the framework for coordinating and improving surveys, making administrative data more useful and integrating data from censuses and improved vital statistics systems. A health information system can be viewed as a continual process of identifying information requirements and developing and integrating the necessary statistics.

Interventions should identify, address and document critical points in the data chain, from data collection and processing to the publication of statistics.

An efficient use of resources requires that data collection exercises are not duplicated. It is therefore vital to establish a close cooperation between the institutions active in the sector. Whether the NSO should publish statistics based on the administrative data or the health administration should publish the data themselves depends on the structure of the national statistical system. A formal service-level agreement or memorandum of understanding, especially for statistical activities not covered by legislation, is often necessary to align the interests of the two services.

Given the needs for effective inter-ministerial coordination, there must be a clear demand and support for improved health statistics at decision-maker level. The data should reflect provincial / regional boundaries, especially if decentralisation of decision making has brought about increased demand for health statistics. Such commitments should be identified in any National Strategy for Development of Statistics (NSDS) and resources planned accordingly.

Sufficient capacity to produce and disseminate the improved statistics requires a structure within the Ministry of Health that is responsible for statistics and planning, in addition to a means of effective communication between the health and statistical authorities. An appropriate level and ability of staff and training are also required.

Where population and health facility data are maintained on GIS, it is essential that they remain up to date. Different ministries may have different GISs, perhaps provided by different donors, so that data communications need to be established.

The key issue in developing a programme of improvement will be to involve the users in determining the key indicators and thus the key data to be collected and developed. At the same time, international demands for core data and indicators according to standard classifications must be met, in particular demands for data for the SDG indicators. This prioritisation exercise should produce a medium-term plan for developing sector statistics, perhaps as part of an NSDS.

At a basic level, one strategy is to focus on achieving progressive improvements in a core administrative statistics publication, such as a yearbook. This approach would focus on improving data collection and thus the number of facilities reported on, as well as improving timeliness, data compilation and tabulation. This procedure should be planned to improve the identification of location, so that provincial / regional statistics can be published. Basic indicators and graphs are presented in a summary document.

As with any social statistical domain, some basic requirements need to be respected in improving health survey statistics:

- The survey outputs – the tables and graphs of results – need to be discussed and defined with stakeholders at the start of the process
- The sample needs to be defined correctly to enable the results to be statistically valid, especially at sub-national level or for specific target groups. A risk exists in many

countries of defining an excessively large and costly sample size that nevertheless may not deliver statistically valid results at sub-national level or for target groups. Nevertheless, social distinctions and target groups often need to be taken into account in designing the sample

- The international classifications described earlier should be respected
- Localised results should be planned to the extent that these can be realised by an affordable and feasible survey plan. Preferably, results should be presented according to regional / provincial government boundaries
- The survey plan, processing and associated logistics need to be designed, costed and presented as part of the survey preparation
- A training plan should accompany the survey plan
- Budget for dissemination of results needs to be included in the survey plan
- Responsibility for release of the results should be clearly defined to lie with the agency responsible for the survey, rather than at a political level

WHO provides technical assistance packages, as well as integrated measurement tools, including disease-specific modules, to set standards, monitor and analyse information. Primary funding of Demographic and Health Surveys (DHS) has been from USAID.

The Global Fund to fight AIDS, Tuberculosis and Malaria is a partnership with governments, civil society, technical agencies, the private sector and individuals affected by disease designed to accelerate the end of AIDS, tuberculosis, malaria and COVID-19 as epidemics. As part of its strategy to build resilient and sustainable systems for health, the Global Fund supports strengthening data systems and data use, and improving data tracking within health systems.

To find out more…

Core classifications, initiatives and activities

- WHO: International Classification of Diseases (ICD-11)
- WHO: International Health Regulations (IHR)
- WHO: World Health Survey Plus
- Demographic and Health Surveys (DHS)
- UNICEF: Multiple Indicator Cluster Surveys (MICS)
- World Bank: Living Standards Measurement Study (LSMS)
- WHO: Health workforce
- UN Statistics Division: Sustainable Development Goals indicators
- UN Statistics Division: Cape Town Global Action Plan for Sustainable Development Data
- Global Fund to fight AIDS, Tuberculosis and Malaria
- WHO: Health accounts
- OECD, Eurostat, WHO: A System of Health Accounts 2011
- OECD: Health at a Glance

Additional information

- UN Statistics Division: Population and housing census
- Inter-secretariat Working Group on Household Surveys (ISWGHS)
- Pan American Regional Observatory of Human Resources in Health
- WHO: Ebola in the Democratic Republic of the Congo 2018-2020 and associated Ebola GIS dashboard RDC
- WHO: Handbook on monitoring and evaluation of human resources for health, 2009
- WHO: Framework and standards for country health information systems, 2nd ed
- Hans Rosling: Reducing child mortality – a moral and environmental imperative (TEDxChange presentation 2010)
- Health financing in Malawi: Evidence from National Health Accounts (Eyob Zere, Oladapo Walker, Joses Kirigia, Felicitas Zawaira, Francis Magombo & Edward Kataika; 2010)
- Malawi Ministry of Health: Malawi National Health Accounts Report 2012/2013–2014/2015 (2016)
- Malawi Ministry of Health: Malawi National Health Accounts – A Summary Brief of Fiscal Years 2015/16, 2016/17 and 2017/18 (2020)
- • Eurostat: Healthcare Expenditure Statistics (Statistics Explained online article)
- • Hanna, T. P., Kangolle, A. C. T. (2010) Cancer control in developing countries: using health data and health services research to measure and improve access, quality and efficiency, BMC International Health and Human Rights, 10, 24
- Zere, E., Walker, O, Kirigia, J., Zawaira, F. Magombo, F. and Kataika, E. (2010) Health financing in Malawi: Evidence from National Health Accounts, BMC International Health and Human Rights, 10, 27
- UNICEF: MICS List of Indicators

Data sources

- Eurostat: Health statistics
- European Centre for disease control (ECDC)
- European Cancer Information System (ECIS)
- OECD.Stat health database
- OECD.Stat healthcare resources database
- Euro-Peristat – statistics on perinatal health
- WHO: World Health Statistics
- Demographic and Health Surveys (DHS) data
- UNICEF: Child statistics
- UNICEF: Multiple Indicator Cluster Surveys (MICS) results
- World Bank: Living Standards Measurement Study (LSMS) data
- World Bank: Health, Nutrition and Population Statistics DataBank
- UN Statistics Division: Population Censuses' Datasets
- Institute for Health Metrics and Evaluation (IHME): Global Health Data Exchange (GHDx)
- UN Statistics Division: Sustainable Development Goals indicators database

E.16 Labour market statistics

E.16. Labour market statistics

The chapter in brief

This chapter aims to guide users in understanding and using labour market statistics, including the use of statistics in labour market monitoring and policy development.

Labour market statistics are essential to analyse not only the labour market in strict terms, but also a number of related socio-economic topics and issues in a given context: at local or country level, at regional level or worldwide. For example, when the unemployment rate in a country is structurally high or tends to rise, what are the related implications at the socio-economic level? More people are in need of social transfers to live or survive; more people tend to migrate elsewhere; more people cannot pay for education or health care; and so on.

Given the labour market's specific, multiple and intersected importance, labour market statistics assume a place similar to that of other key statistical sectors for policy and decision making, such as demography, health, economy and finance, education and science.

Labour market statistics are also fundamental for international development strategies and policies, especially those linked to economic growth and poverty reduction. This is the reason why they have assumed a crucial place and a growing role in the frame of sustainable development statistics at the global level, both in the Sustainable Development Goals (SDGs) and the United Nations Agenda 2030, and previously the Millennium Development Goals (MDGs).

The chapter aims to explain labour market statistics in a simple and – hopefully – exhaustive way. The first section is dedicated to the policy applications of labour market statistics, while the second section goes through concepts and definitions, including classifications. Data sources (e.g., labour force survey, censuses) are described in the third section. The fourth is dedicated to main data quality issues, while the final section provides advice on how to improve labour market statistics. At the end of the chapter, readers can find a detailed list of references, including methodologies, data sources, research reports and development cooperation initiatives, international recommendations, resolutions and guidelines, specific links to the SDGs and the main source of labour market statistics, the labour force survey.

E.16.1. What these statistics are used for

Labour market statistics (or simply 'labour statistics') are fundamental to comprehend, analyse and manage several specific work-related issues and other connected socioeconomic matters.

'Employment' represents one of the core topics of the labour market. In this regard, labour market statistics are used not only to measure the number of employed persons at a given level (country, region etc.), but also key characteristics of this aggregate (e.g., sex, age, sector of activity, type of work, hours worked). When policy makers are called to promote economic growth, they are fundamentally called to foster employment or contribute to create employment opportunities. Employment, together with physical capital or technology, is a key productive factor of economic growth. Employment creation does not mean just creation of jobs or job opportunities, but also ensuring some basic quality requirements such as gender equality, a minimum wage, a set of rights at work. Therefore, policy makers need additional labour market statistics, providing data e.g., on wages and salaries, number of strikes, work inspections, injuries at work etc.

Moreover, statistics on employment provide only a partial picture – although fundamental – of the labour market situation. Another key aggregate associated with employment is 'Unemployment' which counts people that are involuntarily without a job. Policy makers need to understand the reasons why these people remain without a job, despite wishing to work and being actively committed to do so. This is the reason why labour market policies aimed at promoting or increasing employment must act also on unemployment. Users also analyse the so-called 'Economically active population' or 'Labour force' which includes both Employment and Unemployment. This picture becomes even broader, because there is a need to analyse the specific issues of unemployment. Labour market statistics must provide unemployment data according to relevant characteristics (e.g., sex, age, education level, duration of unemployment). These statistics are essential to guide decision making, providing more specific information on the phenomenon and, accordingly, more knowledge and awareness to face it.

This is not everything. What about people who do not actively participate in the labour market? These are people that although belonging to the so-called "Working-age population" (normally taken to be the population aged 15 years old and above) are neither in employment nor in unemployment. This component is called 'Not economically active population' or simply 'Persons outside the labour force'. It is composed of various categories of persons that, for different reasons, do not participate in the labour market: these include retired people, disabled people and students, as well as people that do not search for work because they do not need to and/or want to, or are simply discouraged by a long period of unemployment. When dealing with some socio-economic issues, such as reform of pension systems, promotion of youth opportunities, increase of social transfers (just to mention some examples), policy makers need to have a broad picture of the labour market situation. They need to understand how many people do not participate in the labour market and the reasons why. Are there any contingent or structural reasons explaining inactivity? How can people become active if they have been discouraged? This is a further reason why labour market statistics are important, and why they should be more detailed also for 'Persons outside the labour force', providing information on characteristics such as sex, age, education level, reason of inactivity.

Voluntary or physiological reasons only partially explain inactivity. Indeed, some characteristics seem to impede people from being active, although this is not true for all

people in the same conditions. For example, some disabled persons do not participate in the labour market because of physical constraints, while others want to be more active, to be integrated or reinserted in the labour market regardless of their physical constraints. This should compel policy makers to create job opportunities for these people, for example, through training or forms of support to enterprises hiring people with disabilities. For doing that, policy makers need more detailed data and statistics on the topic.

As can be seen from the discussion above, labour market statistics are fundamental for decision making: the more targeted and effective policy applications are to be, the more extensive, detailed and updated labour market statistics should be.

Labour market statistics have a wide spectrum of policy applications, going beyond demography and economy, to embrace fields like social life, health, education and many others. Let us make another example: how important is the "Youth Unemployment Rate" (usually assumed as the number of unemployed people aged 15-24 years as a percentage of the labour force of the same age group)? This issue is important, not only to understand why many young that are willing to work remain unemployed because of a lack of opportunities. It is also important because these persons represent a highly sensitive target group; they risk being excluded not only from economic production but also from society. They are more sensitive to phenomena like forced migration or crime than their peers who enjoy job opportunities. This is the reason why labour market statistics are so important and relevant for all societies, regardless of their degree of economic development.

The crucial importance of labour market statistics for societies and policy makers is also made evident by their high relevance in international development strategies and policies. Since the beginning of this century, the United Nations system is committed to the achievement of development goals as defined in the 2030 Agenda and the Sustainable Goals (SDGs) and previously the Millennium Development Goals (MDGs). In this regard, the concepts of 'Employment' and 'Decent Work'[1] assume a preeminent place and role in the whole strategy for development. The following box provides a quick overview and understanding.

1 Since a long time, the concept of 'Decent Work' represents a crucial topic in employment promotion. As defined by the International Labour Organization (ILO), decent work "involves opportunities for work that is productive and delivers a fair income, security in the workplace and social protection for families, better prospects for personal development and social integration, freedom for people to express their concerns, organize and participate in the decisions that affect their lives and equality of opportunity and treatment for all women and men" (see ILO's website page on Decent Work).

Box E.16.1: Employment and 'Decent Work' in the Sustainable Development Goals (SDGs)

With the launch of the 2030 Agenda for Sustainable Development in September 2015, the renewed efforts of the United Nations have been focused on the 17 Sustainable Development Goals (SDGs) and related global indicator framework, as approved by the UN General Assembly in July 2017.

The main SDG related to the labour market is **Goal 8 "Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all"**. Still, this is not the only employment-related goal in the 2030 Agenda. There are other goals that include aspects relevant to employment and labour market issues, like Goal 1 "End Poverty in all its forms everywhere", Goal 5 "Achieve gender equality and empower all women and girls" and Goal 10 "Reduce inequality within and among countries".

Goal 8 is articulated into 10 targets (plus two added targets: 8a and 8b) and 14 related indicators (plus two additional indicators, one for each of 8a and 8b respectively). The most relevant and refined indicators are:

Goal 8 is articulated into 10 targets (plus two added targets: 8a and 8b) and 14 related indicators (plus two additional indicators, one for each of 8a and 8b respectively). The most relevant and refined indicators are:

- 8.2.1 – Annual growth rate of real GDP per employed person
- 8.3.1 – Proportion of informal employment in non-agriculture employment, by sex
- 8.5.1 – Average hourly earnings of female and male employees, by occupation, age and persons with disabilities
- 8.5.2 – Unemployment rate by sex, age and persons with disabilities
- 8.6.1 – Proportion of youth (aged 15-24 years) not in employment, education or training
- 8.7.1 – Proportion and number of children aged 5-17 years engaged in child labour, by sex and age
- 8.8.1 – Frequency rates of fatal and non-fatal occupational injuries, by sex and migrant status
- 8.8.2 – Level of national compliance with labour rights (freedom of association and collective bargaining)
- 8.b.1 – Existence of a developed and operationalized national strategy for youth employment, as a distinct strategy or as part of a national employment strategy

The International Labour Organization (ILO) is the custodian agency not only for the above Goal 8 indicators, but also for other relevant SDG indicators related to employment, namely:

- 1.1.1 – Working Poverty Rate (percentage of employed living below 1.90 US$ PPP)
- 1.3.1 – Proportion of population covered by social protection and floors/systems
- 5.5.3 – Female share of employment in managerial positions
- 9.2.2 – Manufacturing employment as proportion of total employment
- 10.4.1 – Labour Income share as percentage of GDP

The ILO ensures monitoring and reporting of the above indicators around the world. It compiles statistics coming from the national statistical offices, verifies data in order to ensure quality and international comparability, makes regional and global estimates, analyses data, reports data and metadata to the United Nations, provides its specific contribution to the SDGs progress reports and supports countries in improving the quality of data to produce the SDGs-related indicators. Coverage is generally ensured from beginning of 2000s until the most recent available year.

To know more:

- International Labour Organization (ILO): Decent Work and the Sustainable Development Indicators. A guidebook on the Sustainable Development Indicators (2018)
- International Labour Organization (ILO): 20th International Conference of Labour Statisticians (ICLS), Geneva 10-19 October 2018,
  Report I – General Report (2018)
- International Labour Organization (ILO): Labour Statistics for the Sustainable Development Goals (SDGs)
- United Nations Statistics Division (UNSD): Goal 8 Decent Work and Economic Growth
- United Nations Statistics Division (UNSD): Global indicator framework: annual refinements E/CN.3/2018/2, E/CN.3/2019/2 and 2020 Comprehensive Review changes and annual refinements E/CN.3/2020/2

E.16.2. Concepts and definitions

E.16.2.1 BACKGROUND

At the international level, the International Labour Organization (ILO) promotes standards on various topics of labour market statistics. Standards are defined according to Conventions and Recommendations adopted by the ILO's annual International Labour Conference, and to Resolutions and Guidelines adopted by the International Conference of Labour Statisticians.

The ILO Convention n° 160 provides general guidelines encompassing all areas of basic labour market statistics. It is complemented by several resolutions regarding specific topics, including the statistics of child labour, the measurement of working time, the economically active population, employment, underemployment, employment in the informal sector and classifications. The Resolutions provide information on conceptual frameworks, definitions and methodologies to be used when producing labour market statistics. They are complemented by Guidelines which refer to specific areas.

Numerous statistical variables and indicators are collected in order to give a comprehensive overview of the labour market. The definitions of the main variables, as agreed at the international level, are presented in the following section. Generally, the terminology used is that of the ILO. The ILO plays a key role given its position as a specialised agency of the UN, which includes a specific responsibility for labour market statistics. In addition, other actors are involved in labour market statistics, including Eurostat, OECD, IMF, UNSD and the World Bank. Since a long time, the ILO and other international actors have been working to improve the quality of labour market statistics, through the promotion of international harmonization of concepts and definitions and through technical assistance to improve statistical capacity at national level.

Many more indicators than the ones defined in the following section are available at European level. To improve harmonisation of labour market statistics and the related definitions and concepts throughout the European Statistical System, a number of regulations have been adopted and form the legal basis for the labour market statistics in the EU. Generally, the definitions and recommendations of the International Labour Organization are followed.

Eurostat's Labour market statistics website provides methodological information and definitions for EU labour market statistics, as well as references to international methodological recommendations, guidelines etc. The European Union Labour Force Survey (EU-LFS) website contains detailed information regarding the concepts and definitions, survey methods, organization and comparability of the EU-LFS. Eurostat also maintains a Concepts and Definitions Database (CODED) where, amongst others, concepts and definitions for labour market statistics can be consulted.

E.16.2.2. CONCEPTS AND DEFINITIONS

The core general concept in labour market statistics is Work as productive activity.

The most relevant component of work is Employment, which refers only to work for others, for pay or for profit, excluding other forms of work (such as unpaid trainee work, volunteer work or work for own final use). This distinction is important. Everybody can work, but not everybody is employed (in any form: formal or informal; or any status: independent workers or dependent workers).

Labour statistics do not focus only on work and its main component (i.e. employment). They also provide a broader view of the labour market. In fact, labour represents a "service" in productive activities. As such, it is characterised by two dimensions: supply and demand.

Labour supply statistics (LS) refer to the population that is concretely or potentially involved in the labour market. The starting point is the Working-age Population (WP), namely the population normally assumed to be of working age (usually 15 years old and above). The part of this population that is actively participating in the labour market is called "Economically Active Population" or "Labour Force (LF)", while the remaining part is defined as "Not Economically Active Population" or "Persons outside the Labour Force". The Labour Force is the sum of Employment (EM) and Unemployment (UN). Unemployment refers to persons who are not in employment but want to work and are actively committed to search for a job.

On the labour demand side (LD), labour market statistics refer to the actors who use the service defined as "labour", namely the employers. Some examples of relevant labour demand statistics are statistics on job vacancies, skills required by job offers and job creation.

Box E.16.2: Key ILO definitions

According to the ILO, "Labour statistics refer to the productive activities of workers, and the labour market deficiencies associated with them. Work comprises any activity performed by persons of any sex and age to produce goods or to provide services for use by others or for own use, and labour statistics potentially cover all forms of work. This includes for pay or profit for use by others (employment), work not for pay or profit for use by others (unpaid trainee work, volunteer work, and other work activities) and work for own final use (own-use production work)" (ILO: Quick Guide on Sources and Uses of Labour Statistics (2017)).

According to the 19th Resolution of the International Conference of Labour Statisticians concerning statistics of work, employment and labour underutilization (ILO 2013):

"Work comprises any activity performed by persons of any sex and age to produce goods or to provide services for use by others or for own use. (a) Work is defined irrespective of its formal or informal character or the legality of the activity. (b) Work excludes activities that do not involve producing goods or services (e.g., begging and stealing), self-care (e.g. personal grooming and hygiene) and activities that cannot be performed by another person on one's own behalf (e.g. sleeping, learning and activities for own recreation). (c) The concept of work is aligned with the General production boundary as defined in the System of National Accounts 2008 (2008 SNA) and its concept of economic unit that distinguishes between: (i) market units (i.e. corporations, quasi-corporations and household unincorporated market enterprises; (ii) nonmarket units (i.e. government and non-profit institutions serving households); and (iii) households that produce goods or services for own final use. (d) Work can be performed in any kind of economic unit."

"The various forms of work are measured with respect to a short reference period. The appropriate reference period for each form is based on the intensity of participation and working time arrangements: (a) seven days or one week, for employment and unpaid trainee work; (b) four weeks or one calendar month, for own-use production of goods, unpaid trainee work and volunteer work; (c) one or more 24-hour days within a seven-day or one-week period, for own-use provision of services."

"Measures of labour underutilization include, but may not be restricted to: (a) time-related underemployment, when the working time of persons in employment is insufficient in relation to alternative employment situations in which they are willing and available to engage; (b) unemployment, reflecting an active job search by persons not in employment who are available for this form of work; (c) potential labour force, referring to persons not in employment who express an interest in this form of work but for whom existing conditions limit their active job search and/or their availability."

Labour market statistics are not merely limited to the conceptual pillars of the labour market. Indeed, they cover a wide range of domains, including formal or informal sector, wages and salaries, working time, rights of workers (e.g., membership in trade unions), conditions at work (e.g., occupational injuries) and labour productivity.

Below is a selection of the main labour market statistics, based on recognised international standards, by topic:

Labour Force, Employment and Unemployment

The Economically active population (or Labour force) encompasses persons employed and unemployed. People are classified as employed or unemployed according to the definitions of the ILO (see below). When measured for a short period of time, e.g., a day or a week, it refers to the labour force or the current economically active population. When measured for a long period of time, such as a year, it relates to the usually active population. The Activity rate is the share of the total population that is economically active, i.e., the labour force as a percentage of the population of working age.

Employed persons are those who, during a short reference period, did any activity for pay or profit, or were not working but had jobs from which they were temporarily absent or engaged in different working-time arrangements. Pay includes cash payments or payment in kind (i.e., payment in goods or services rather than money), whether payment was received in the week the work was done or not. Anyone who receives a wage for on-the-job training which involves production of goods or services is also considered as being in employment. Self-employed and family workers are also included. The Employment rate is calculated as the share of persons in employment in the total population; the employment rate is frequently broken down by sex and age groups.

- **Unemployment** includes all persons of working age who – during a specified recent period – ***"were not in employment, carried out activities to seek employment and were currently available to take up employment (given a job opportunity)"***. The **Unemployment rate** is the number of people unemployed as a percentage of the labour force. The **Youth unemployment rate** expresses the percentage of unemployed persons aged 15-24 years in the labour force in this age group. The **Long-term unemployment rate** is the number of persons unemployed for 12 months or longer as a percentage of the labour force.
- **Labour underutilization** is composed of all those persons in working age whose willingness to be employed is not matched by the opportunities offered by the labour market.

Labour conditions

Labour conditions cover issues such as wages, working time, work organization, maternity protection and arrangements to adapt working life to the demands of life outside work. It can be defined as the legislated conditions that shape workers' experience at work. Numerous conventions regarding working time and work organization have been adopted, and several associated international standards exist. A key international policy initiative aimed at improving labour conditions is the ILO's Decent Work Agenda (see the ILO's Decent Work website.

According to the ILO methodology, the definitions of main indicators are the following:

- **Usual hours worked** are the modal value of the actual hours worked per week over a long reference period, excluding weeks when an absence from work occurs (e.g., holidays, leaves, strikes ...).
- **Actual hours worked** in the reference week are the hours the person spent in work activities during the reference week. Work activities should include production activities, ancillary activities, short pauses and education and training, which are necessary for successfully carrying out either the production or ancillary activities.

Actual hours worked should exclude travel time between home and the place of work, the main meal breaks, absences from work within the working period for personal reasons and education and training hours which are not necessary for carrying out the production or ancillary activities.

Health and Safety at Work

Health and safety at work is a cross-disciplinary area. Since 1950, the ILO and the World Health Organization (WHO) have shared a common definition of occupational health. It was adopted by the Joint ILO/WHO Committee on Occupational Health at its first session in 1950. The definition reads:

> *"Occupational health should aim at: the promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations; the prevention amongst workers of departures from health caused by their working conditions; the protection of workers in their employment from risks resulting from factors adverse to health; the placing and maintenance of the worker in an occupational environment adapted to his physiological and psychological capabilities; and, to summarize, the adaptation of work to man and of each man to his job.".*

Current international statistical guidelines on occupational injuries are found in the Resolution concerning "Statistics on occupational injuries resulting from accidents at work" (adopted by the ILO's 16th International Conference of Labour Statisticians (ICLS), 1998), which adopted much of the European Commission's European Statistics on Accidents at Work (ESAW) methodology. The ICLS Resolution and the ESAW methodology provide terms and definitions for statistics on occupational injuries.

According to the ILO methodology, the definitions of main indicators are:

- **Occupational accident:** an unexpected and unplanned occurrence, including acts of violence, arising out of or in connection with work which results in one or more workers incurring a personal injury, disease or death; as occupational accidents are to be considered travel, transport or road traffic accidents in which workers are injured and which arise out of or in the course of work, i.e. while engaged in an economic activity, or at work, or carrying on the business of the employer;
- **Occupational injury:** any personal injury, disease or death resulting from an occupational accident; an occupational injury is therefore distinct from an occupational disease, which is a disease contracted as a result of an exposure over a period of time to risk factors arising from work activity.

Strikes and Lockouts

Official statistics related to strikes and lockouts are provided following the guidelines included in the Resolution concerning statistics of strikes, lockouts and other actions due to labour disputes, adopted by the 15th International Conference of Labour Statisticians in 1993, which gives the following definitions:

- A **Strike** is a temporary work stoppage effected by one or more groups of workers with a view to enforcing or resisting demands, or expressing grievances, or supporting other workers in their demands or grievances.
- A **Lockout** is a total or partial temporary closure of one or more places of employment, or the hindering of the normal work activities of employees, by one or more employers with a view to enforcing or resisting demands or expressing grievances, or supporting other employers in their demands or grievances.
- **Workers involved in a strike:** workers directly involved in a strike are those who participated directly by stopping work. Workers indirectly involved in a strike are those employees of the establishments involved, or self-employed workers in the group involved, who did not participate directly by stopping work but who were prevented from working because of the strike.
- **Workers involved in a lockout:** workers directly involved in a lockout are those employees of the establishments involved who were directly concerned by the labour dispute and who were prevented from working by the lockout. Workers indirectly involved in a lockout are those employees of the establishments involved who were not directly concerned by the labour dispute but who were prevented from working by the lockout.
- A **Labour dispute** is a state of disagreement over a particular issue or group of issues over which there is conflict between workers and employers, or about which grievance is expressed by workers or employers, or about which workers or employers support other workers or employers in their demands or grievances.

Job Vacancies and Job Creation

Job vacancy statistics provide information on the demand side of the labour market (whereas employment and related statistics illustrate the supply side). These indicators are used to analyse the business cycle and as early indicators of downturns in it. Recently, emphasis has been put on job vacancies and job creation, which belong to the indicators used to closely monitor short-term changes in the labour market.

The Eurostat definition is as follows (see Eurostat's Labour Market Glossary):

- **Job vacancy** is defined as a paid post newly created, unoccupied, or about to become vacant for which the employer is taking active steps to find a suitable candidate and is prepared to take further steps to find a suitable candidate from outside the enterprise concerned; and which the employer intends to fill either immediately or within a specific period of time.

The concepts "active steps to find a suitable candidate" and "specific period of time" are country-specific and defined in relation to national legislation. A vacant post that is only open to internal candidates is not treated as a 'job vacancy'.

Job vacancy statistics are predominantly presented in terms of the Job Vacancy Rate (JVR). This indicator measures the percentage of total posts that are vacant, in line with the definition of job vacancy above, expressed as follows (see Eurostat's Labour Market Glossary):

*JVR = number of job vacancies / (number of occupied posts + number of job vacancies) * 100*

An occupied post is a post within an organization to which an employee has been assigned.

Job creation is a new concept in labour market statistics and represents the new jobs created in a given area (country, region etc.) in a specific period (e.g., on a monthly basis). It normally refers to the jobs created directly or indirectly by governments through their policies aiming at reducing unemployment or labour underutilisation.

E.16.2.3 CLASSIFICATIONS

Several classifications are relevant for labour market statistics. The ILO is responsible for the maintenance, the update and the revision of two main classifications specifically used for labour market statistics; the International Standard Classification of Occupations (ISCO) and the International Classification of Status in Employment (ICSE).

- The International Standard Classification of Occupations (ISCO) groups individuals working in similar types of work, defined by tasks and duties undertaken in the job, irrespective of where the work is performed. It is discussed in section B.5.2.7.
- The International Classification of Status in Employment (ICSE) is a set of discrete values which can be assigned to the variable "type of contract which a person has with other persons or organizations when performing a particular job" when that is measured in a statistical survey or registered in other administrative files.

Other classifications are also of relevance to labour market statistics, in particular:

- United Nations' International Standard Industrial Classification of all Economic Activities (ISIC). In the European Statistical System, the NACE classification is used.[2]
- UNESCO's International Standard Classification of Education (ISCED).

It must be pointed out that employment is not only employment that is framed in a formal way (registered enterprises, registered self-work), but also comprises productive activities that are implemented outside the country's current legislation. This is usually categorised as informal employment. Since a long time, informal employment has assumed a growing interest for both labour statisticians and policy makers. In this regard, the International Labour Organization (ILO) and the Organization for Economic Development and Co-operation (OECD) have provided valuable contributions to the definition and the measurement of informal employment (see the following box). The informal economy, from the National Accounts' point of view, is discussed in section F.17.5.2.

Box E.16.3: Informal sector and informal employment

The term "informal economy" is used by the ILO as including the informal sector as well as informal employment. An international conceptual framework for measurement of the non-observed economy already exists, which distinguishes the informal sector from underground production, illegal production and household production for own final use. The concept of informal sector refers to production units as observation units, while the concept of informal employment refers to jobs as observation units (OECD 2002). Informal sector enterprises and employment in the informal sector are defined according to the resolution concerning statistics of employment in the informal sector, adopted by the 15th International Conference of Labour Statisticians (ICLS).

According to the 17th ICLS, **informal employment** comprises the total number of informal jobs, whether carried out in formal sector enterprises, informal sector enterprises, or households, during a given reference period:

1. own-account workers employed in their own informal sector enterprises;
2. employers employed in their own informal sector enterprises;
3. contributing family workers, irrespective of whether they work in formal or informal sector enterprises;
4. members of informal producers' cooperatives;
5. employees holding informal jobs in formal sector enterprises, informal sector enterprises, or as paid domestic workers employed by households;
6. own-account workers engaged in the production of goods exclusively for own final use by their household, if considered employed according to paragraph 9(6) of the resolution concerning statistics of the economically active population, employment, unemployment and underemployment adopted by the 13th ICLS.

Employees are considered to have informal jobs if their employment relationship is, in law or in practice, not subject to national labour legislation, income taxation, social protection or entitlement to certain employment benefits. The reasons may be that the jobs or the employees have not been declared, the jobs are casual or of a limited short duration, the hours of work or wages fall below a specified threshold, they are employed by unincorporated enterprises or by persons in households, the employee's place of work is outside the premises of the employer's enterprise (e.g., outworkers without employment contract), or labour regulations are not applied, not enforced, or not complied with for any other reason for the jobs in question.

Continues to next page >

2 NACE is based on ISIC and adapted to reflect economic activities of particular relevance to the European economy through sub-division of ISIC sub-groups. Statistics produced on the basis of NACE are comparable at European and, in general, at world level.

The structure and size of the informal economy vary greatly between countries. The operational criteria for defining informal jobs of employees must be determined in accordance with national circumstances and data availability.

Informal employment outside the informal sector comprises: employees holding informal jobs in formal sector enterprises (or as paid domestic workers employed by households), contributing family workers working in formal sector enterprises, own-account workers engaged in the production of goods exclusively for own final use by their household.

Countries which exclude agricultural activities from the scope of their informal sector statistics should develop suitable definitions of informal jobs in agriculture, especially with respect to jobs held by own-account workers, employers and members of producers' cooperatives.

Some options of revision to the 15th ICLS Resolution and the 17th ICLS Guidelines have also been envisaged in the course of the 20th ICLS and under work to be elaborated and presented to the next 21st ICLS.

To know more:

- ILO: 20th International Conference of Labour Statisticians (ICLS), Revision of the 15th ICLS Resolution concerning statistics of employment in the informal sector and the 17th ICLS guidelines regarding the statistical definition of informal employment, Geneva (10-19 October 2018)
- ILO: 17th International Conference of Labour Statisticians (ICLS), Guidelines concerning a statistical definition of informal employment, Geneva (November-December 2003)
- ILO: 15th International Conference of Labour Statisticians (ICLS), Resolution concerning statistics on employment in the informal sector, Geneva (January 1993)
- ILO: Informal Economy (Website)
- OECD: Glossary of Statistical Terms

E.16.3. Data sources

E.16.3.1 SOURCES OF LABOUR STATISTICS

There are various sources of labour statistics; the main ones are the following:

- Labour Force Survey (LFS)
- Population census
- Business surveys
- Administrative sources (e.g., employment services)
- Other specific sources (e.g., trade unions)
- Other surveys (e.g., Demographic and Health Surveys)

The Labour Force Survey (LFS) represents the most important and wide source of statistical information on labour. It is held at the level of households and provides detailed data on topics such as working-age population, labour force (employment, unemployment, potential labour force), hours of work, youth not in employment, education and training (NEET). These aggregates are generally broken down by sex, age, education level and other specific characteristics linked to the items (e.g., for employment: sector of economic activity, status in employment). LFS also provides other useful information such as workers' earnings.

The population census also represents an important source of data on the labour market. This is a universal survey usually undertaken every ten years. Its focus is on the general characteristics of the population and housing. A specific module is also dedicated to the economic activities of people, including employment and unemployment. Data are not as accurate and detailed as the ones provided by the LFS, which strictly focuses on the labour characteristics of the population. Censuses are normally used as a complementary source of labour statistics and usually provide the sampling frame from which the sample of the LFS - as well as other household surveys - are drawn. The population census still represents the unique source of labour statistics for countries lacking a labour force survey or similar regular survey. Censuses are discussed in more detail in chapter E.13.

Business surveys represent an important source of data on job vacancies, skills required by employers, wages, continuing vocational training and labour costs. Moreover, they provide detailed information on the characteristics of the business establishments (e.g., size, activity). The sample is usually drawn from the records of business registers where only formal business units are included. Therefore, the enterprises operating in the informal sector are often not covered. Business surveys are discussed in chapter F.21.

Employment services represent the main administrative source of statistical information on the labour market. They represent a quick source of data on job-seekers (or registered unemployed persons) and their scope is to match these data coming from workers (supply side) with job vacancies coming from enterprises (demand side). However, data are often not accurate - being based on standards not comparable with international nomenclatures or other sources - and frequently not updated.

Indeed, an analysis of the labour market should make use of various sources of data, depending on the characteristics that are being focussed on and their specificities. For example, statistics on strikes and lockouts are provided by Labour Relations Records; occupational injuries by Insurance Records; labour income share by using the National Accounts.

The following box provides a concise summary of the different sources of labour market statistics.

Since a long time, the Labour Force Survey (LFS) represents the fundamental source of labour statistics in the European Union. The current EU-LFS represents a benchmark in terms of design, organization, implementation and methodological innovation. See the following box for a quick, concise and comprehensive view of the EU-LFS.

Box E.16.4: Recommended sources for key labour market statistics

Labour Force Survey (LFS):

- Working-age population (usually assumed as the one aged 15 years and above)
- Labour force or economically active population (i.e., employment plus unemployment)
- Employment and unemployment
- Underemployment
- Hours of work of all workers
- Time-related underemployment
- Potential labour force
- Youth Not in Employment, Education or Training (NEET)

Population census:

- Total population (normally used as population frame for LFS or other household surveys)
- Other labour statistics (working-age population, labour force, employment, unemployment), but not as accurate and disaggregated as the LFS data (this latter is preferably to be used)

Business surveys:

- Wages
- Hours of work of paid employees
- Vacancy statistics
- Labour costs
- Characteristics of business establishments (e.g., size, sector of activity)

Employment services/offices:

- Registered unemployment
- Registered job vacancies

Trade unions:

- Employed members of trade unions
- Employees covered by collective bargaining

Labour relations records:

- Number of strikes and lockouts
- Workers involved in strikes and lockouts
- Days not worked due to strikes and lockouts

Insurance records:

- Fatal occupational Injuries
- Non-fatal occupational injuries

Labour inspection records:

- Labour inspectors
- Labour inspection visits

National Accounts:

- Labour productivity, where the numerator is the Gross Domestic Product (GDP) and the denominator is usually drawn from LFS (persons employed)
- Labour Income share (wages and social protection transfers of employees)

To know more:

ILO: Quick Guide on Sources and Uses of Labour Statistics (2017)

E.16.3.2 INTERNATIONAL DATABASES

The most recommended labour market databases at international level are described as follows.

The first recognised source of labour statistics is the International Labour Organization (ILO) with its broad and detailed database ILOSTAT. ILOSTAT covers several topics of labour statistics: labour supply (e.g., labour force, employment and unemployment), industrial relations (e.g., collective bargaining, membership to trade unions), competitiveness (e.g., labour productivity, labour cost), poverty and inequality (e.g., working poor, informal economy), working conditions (wages, working time, safety and health conditions). Furthermore, data cover selected groups (e.g., youth, labour migrants) and also some key or new topics (child labour, SDGs, COVID-19). Data coverage is ensured for all countries with available statistics: data are continuously updated and freely downloadable from the institutional website. A very interesting section of ILOSTAT is also dedicated to LFS resources, a worldwide tutorial for survey design, including questionnaire models and modes of administration based on the ILO recognised international standards. Another important section is dedicated to Labour Market Information Systems (LMIS), a portal for all countries who want to build or improve their own LMIS, for which the ILO ensures a detailed and user-friendly tutorial covering architecture, data processing, data inputs and outputs.

In the **European Union**, Eurostat publishes **the Employment and Unemployment (LFS) Database** with full tables on all LFS topics, generally from 2008 onwards. Data are reported on an annual and a quarterly basis. They are available in various formats: tables, charts and maps. Data are also provided at territorial level (i.e., countries' NUTS 2 regions). This database also includes the monthly sample size at both country and aggregate level (EU). It further contains the indicators derived from the annual LFS modules.

Within the theme "Population and Social Conditions", Eurostat's online database contains a section dedicated to **Labour Market** statistics that includes the following sub-sections: Employment and Unemployment (LFS), job vacancies statistics, earnings and labour costs. In the same general database, the section "EU Policies" includes the sub-section "Employment and Social Policy Indicators"; within this latter, the **Employment Performance Monitor** provides specific indicators dedicated to employment issues (e.g., gender employment gap, youth employment rate, labour productivity per person employed and hours worked, newly employed, involuntary temporary employment). In the section "Cross-cutting topics", **Skill-related statistics** provide data on skills' supply (e.g., ICT usage in households and by individuals) and skills' demand (e.g., enterprises that recruited ICT specialists), while Quality of Employment provides statistics on accidents at work, income from employment, work-life balance etc.

Within the "EU Policies", the sub-section dedicated to the **Sustainable Development Indicators (SDGs)** presents ad-hoc indicators calibrated on Goal 8 (e.g., long-term unemployment rate, NEET, people killed in accidents at work),

Box E.16.5: The European Union's Labour Force Survey (EU-LFS)

The European Union's Labour Force Survey (EU-LFS) represents the main statistical tool to collect labour force statistics in the European Union (EU).

In 1960, Eurostat organised the first LFS in the six Original Member States (i.e., Belgium, France, Germany, Italy, Luxembourg, and Netherlands). Other LFS surveys were held between 1968 and 1971 on a yearly basis. From 1973 to 1981, the LFS was conducted on a biennial basis; from 1983 to 1997, once per year (in spring); since 1998 it is carried out on a quarterly continuous basis.

The LFS found its first legal basis in EC legislation in 1973, followed by EC Council Regulation n. 577/98. This has subsequently been modified and implemented. Since 1st January 2021, the legal basis is the EU regulation 2019/1700.

The EU-LFS currently covers 34 countries, including the 27 EU Member States, three EFTA countries (Iceland, Norway and Switzerland) and four candidate countries (Montenegro, North Macedonia, Serbia and Türkiye).

The EU-LFS is based on the current international standards and guidelines (ILO) and makes use of common concepts and definitions, classifications and variables for all countries. This allows a sound comparison of data in a both static (cross-country) and dynamic (over time) perspective.

The survey is carried out on a quarterly basis; data are collected by the national statistical offices of the participating countries and transmitted to Eurostat that validate and publish country data and EU aggregates.

Data -are provided on a quarterly and annual basis. The survey comprises a core set of around 100 variables, and a rotating ad-hoc module every year (e.g., in EU-LFS 2020: Accidents at work and work related health problems; in EU-LFS 2021: Labour market situation of migrants and their immediate descendants).

Four interview modes are foreseen (face-to-face, phone, web and self-administered interviews); the majority of interviews are based on computerised questionnaires.

The main objective of the EU-LFS is to provide detailed information on the three components of the Working-age population (i.e., people aged 15 years and above):

- Employment
- Unemployment
- Inactive population

The EU-LFS is used for multiple purposes:

- To monitor and analyse situations and trends in the national and EU labour markets
- To monitor and analyse the countries' performance vis-à-vis the targets laid down by the EU 2020 Strategy (e.g., Employment Targets), the European Employment Strategy (EES), the EU Joint Assessment Framework (JAF), and the related EU Sustainable Development Goals (SDGs) as well as for the Pillar of Social Rights
- To provide the Euro Area with updated and reliable information on key labour market indicators (e.g., Employment rate, Unemployment rate)

To Know more:

- Eurostat: Employment and unemployment – Overview
- Eurostat: EU Labour Force Survey (Statistics Explained article)
- Eurostat: EU labour force survey – development and history
- Eurostat: EU Labour Force Survey Database User Guide (2023)
- Eurostat: EU Labour Force Survey Database User Guide (data up to reference year 2020) (2021)

and other relevant goals (in work at-risk-of-poverty rate, relevant to Goal 1).

Another recognised source of labour statistics at worldwide level is the World Bank with its innovative Jobs Diagnostics and Data. This is a freely accessible database with more than 70 standardised indicators on employment, covering around 120 countries on the basis of more than 1 200 surveys. Jobs indicators are disaggregated by sex, geographic location (urban/rural) and education level. Methodology, tools and guidance for jobs indicators are also provided. Some examples: structure of population, labour force and employment; employment by type, sector and occupation; labour market outcomes (weekly working hours, median monthly wages); educational attainment.

As for health conditions at work, the World Health Organization (WHO) holds a health database covering 194 countries across the world – the Global Health Observatory Data Repository - including statistics on occupational injuries. Data are freely accessible from the WHO's website.

Other international organizations provide detailed and accurate databases on labour statistics at regional level (i.e., mostly focused on their member countries). This is the case of the **Organization for Economic Co-operation and Development (OECD).** The OECD publishes the Employment Database, a complete source of data on several labour issues: employment, unemployment, earnings and wages, labour market policies and institutions, skills and works - with the Survey of Adult Skills (PIAAC) and the World Indicators of Skills for Employment (WISE) – and job quality (as measured through Earnings Quality, Labour Market Security and Quality of the Working Environment). The database covers all OECD countries and contains data from the beginning of the 2000s. Data are freely available on the OECD website in various formats, including charts and maps.

E.16.4. Analysing data quality and identifying problems

There are two key official tools to make a diagnosis of the statistics produced at international level, including labour market statistics. These are:

- The **Data Quality Assessment Framework (DQAF)** developed by the International Monetary Fund (IMF) – latest version published in 2012
- The **European Statistics Code of Practice** developed by Eurostat with the European Statistical System. The Code of Practice is integrated in the Quality Assurance Framework of the European Statistical System.

The DQAF is a reference document for national statistical systems across the world, while the European Statistics Code of Practice is applied to the national statistical systems of the European Statistical System. It is also functioning as basis for Eurostat assessment of countries within the European Neighbourhood Policy (ENP). DQAF and the European Statistics Code of Practice are broadly harmonised and provide principles and recommendations to ensure quality criteria in the production of statistics, including institutional environment, resources, methodology, procedures, accuracy and reliability. Both tools are applicable to all sector statistics, including labour statistics.

The ILO is the leading institution providing international standards for concepts, definitions and procedures in the field of labour market statistics. Although all countries around the world in principle are committed to these standards, not all of them are at the same level with respect to quality. Labour market statistics at the level of EU and OECD are characterised by high standards of quality and comparability (e.g., working-age population, labour force, employment and unemployment indicators, job vacancies). However, this is not yet completely reached in a number of partner countries, where some international quality standards are not yet matched, e.g., due to the adoption of different definitions and tools of data collection or continued use of outdated versions of international classifications and methodologies. For example, in some partner countries, the lower limit of the working-age population is still below the age of 15 years (i.e., the standard assumed at the international level) because of the predominance of child labour and the different upper age for mandatory school education. A few partner countries do not have a regular labour force survey as they do not have the financial and/or human resources required to organise this kind of survey or to do so on a regular basis. Many of them still refer to population censuses data that in principle are not comparable with the LFS or other survey data and contain different definitions of core concepts of labour market.

Even where a labour force survey or a similar tool is in place, regardless of common issues linked to the presence and treatment of sampling and non-sampling errors, there are concerns with respect to the sampling frame. For example, the natural sampling frame for labour force surveys (or any household survey) is the population census or the population register (where this exists). Many partner countries lack a population register and refer - as the unique source of demographic data - to the population census which is normally held every ten years. The population dynamics of most partner countries are not absolutely comparable with those of developed countries, and demographic data in both absolute and structural terms may not be reliable anymore even after a couple of years. For this reason, any subsequent survey referring to the population census as its population frame suffers from problems linked to the construction of the sample.

There are also constraints linked to the specific topics. The measurement of the informal economy - and specifically the informal employment - has generally assumed a crucial role in the developed countries where the phenomenon is generally much less prevalent than in most partner countries. In most developed countries, the LFS questionnaires are structured to gauge many characteristics of the informal employment. In some partner countries, even where a similar tool to LFS exists, the questionnaires do not contain specific questions on informal employment.

With regard to the demand side, many partner countries lack a business register from which the samples for business surveys are normally drawn. This hampers the possibility to design a representative sample of establishments.

Data constraints do not affect only survey data (universal or sample surveys), but also the administrative sources. The use of administrative data to compile statistics has the advantage of generally being less costly than the implementation of surveys and treatment of data from these. However, the reliability and especially the adequacy of administrative data depend on the organization and ability of the administration to manage and maintain them efficiently. For instance, if unemployed people do not systematically register at job agencies (e.g., because the agency is not efficient or because there is no incentive to do so), information from those agencies will have a poor coverage of the actually unemployed population.

Finally, at national level, the multiple sources for producing labour market data (population censuses, labour force surveys, establishment surveys and administrative records) may create confusion. These data sources have the advantage of providing users with a wide spectrum of statistics. However, different data sources with different methodologies measure the same phenomena in different ways, with higher or lower accuracy and coverage. As a result, the final figure for the same type of variable may not be directly comparable across sources. In addition, not all countries are able to produce data on a regular basis.

The comparison of data from different sources is also a way to identify and understand problems and gaps. Some countries go one step further and try to reconcile/adjust data collected from different sources in order to bridge distinctive gaps in coverage of individual sources, smooth over measurement errors and harmonise definitions and classifications used. Other countries go further by integrating data or constructing labour accounting systems where various types of inconsistent data are reconciled to yield hybrid "best" estimates. The main aim of such systems is to

combine statistical data sources to enhance their strengths and overcome their weaknesses, in order to produce new data series with improved quality. One of the advantages is the elimination of contradictory results.

E.16.5. Improving sector statistics

Countries' statistical capacities may be developed along different paths and strategies, depending on the national context, policies, development goals and practices. For these reasons, this section does not seek to be prescriptive or exhaustive. Instead, it describes some key constraints and considerations, as well as important priority actions recommended by ILO that should be considered when seeking to improve labour market statistics in the framework of a cooperation program.

Even if national settings are very different, many of the problems in the development of sustainable systems for labour market statistics are common. Some widespread challenges for developing and improving the capacity for producing labour market statistics in a partner country are:

- Labour market statistical systems are often not sufficiently coordinated. Concepts, definitions and classifications are not harmonised within countries and the labour market statistical system is not well co-ordinated with the statistical system for related domains (e.g., education, health, agriculture). Data might be available, but there may be (partly serious) problems concerning coherence, definitions and the quality control of the data.
- Given the numerous stakeholders involved in producing labour market data, inter-institutional co-ordination is a major issue in many countries. Often, the Ministry of Labour and the National Statistical Office do not collaborate closely to define statistical needs and priorities, co-ordinate statistical standards and output or avoid overlaps in data collection.
- A lack of capacities within government ministries (e.g., ministries responsible for labour, social security, education, vocational training, and occupational health) to generate quality data from administrative records is often observed in partner countries. In addition, statistics on the supply and demand in the labour market, based on registers kept by employment agencies, may be very unreliable due to their low coverage of the labour market (informal sector not covered; vacancies are not reported; unemployed persons are not registering).
- A lack of communication between users and producers of statistics is often observed. Access to data might be difficult (even if data exist) and dissemination not appropriate. A lack of co-ordination of concepts and definitions generates difficulties for users in reconciling statistics produced from different sources and for different regions or periods. Users may also lack the specialised skills and knowledge to analyse and interpret the labour market statistics.

Each of these challenges needs to be addressed in order to develop and improve the capacity to produce even a basic set of labour market statistics. Factors that should be put in place to make data available include:

- organization of the statistical system for labour market data;
- primary data collection mechanisms;
- data processing methods;
- dissemination mechanisms;

Box E.16.6: Example of two data sources in Europe: EU-LFS and National Accounts

The EU Labour Force Survey (EU-LFS) and National Accounts of EU Member States are the two main sources of employment data. These two sources are not independent: LFS is frequently an input to National Accounts employment estimates. Although using common definitions, LFS and National Accounts have their own aims and measurement approaches, which may lead to different results. In addition, other statistics based on business surveys or administrative sources also provide estimates of employment, which may differ from these other sources. They may also be used as input to the National Accounts. The main differences between LFS and National Accounts concern elements of geographical coverage (employed resident persons employed in the LFS, persons employed in resident production units in National Accounts), other coverage issues such as age boundaries and treatment of institutional households, and some borderline differences regarding for example the recording of conscripts, unpaid apprentices and trainees or work in agriculture solely for own consumption.

To ensure consistency between the numerator (output in terms of value added) and the denominator (labour input) in the productivity indicators, the primary source for employment growth and branches of activity is National Accounts data; EU-LFS data are used for employment rates and for gender and social breakdowns.

To know more:

- Eurostat: Employment and Unemployment (LFS) – an overview
- Eurostat: National Accounts – an overview (website)

- data analysis capacity;
- staff qualifications;
- funding mechanisms;
- hardware and software equipment;
- premises;
- partnerships with non-statistical units and with employers and trade unions.

Furthermore, factors concerning possible synergies with other data production mechanisms must be addressed:

- sampling frames and registers;
- survey systems;
- dissemination of statistics;
- compatibility of concepts adopted;
- synchronisation of activities;
- training;
- multi-sectoral analyses within the framework of development and poverty reduction policies;
- user-satisfaction surveys.

ILO generally recommends prioritising the following actions:

- If it does not already exist in a given country, the highest priority should be given to the introduction of at least one national household survey with detailed labour force questions (preferably a labour force survey (LFS)) and subsequently a regular programme of LFS. At early stages of development in a country with limited resources and capacities, the labour force survey programme might comprise annual surveys of urban areas and 5-yearly (intercensal) surveys with national coverage. Informal employment should be measured in these labour force surveys. ILO provides specific guidelines for covering the informal labour market (see also 17th ICLS, Guidelines concerning a statistical definition of informal employment, 2003)
- Second priority should be given to build the capacity of the NSO and government ministries to generate quality statistics from administrative records. In order to build this capacity, it might be useful to initially develop statistics from one simple system only (such as reports of labour disputes or registered job-seekers), in order to build the confidence and skills of the statistical staff.

In countries where labour market statistics are more advanced (a good LFS already exists, ad-hoc surveys are conducted, e.g., on child labour or the informal sector, statistics from administrative records are available but with uneven quality), priority can be given to the improvement or widening of the existing process, such as:

- increasing the frequency of the LFS (e.g., making it quarterly or monthly);
- widening the thematic coverage of the LFS (e.g., with modules related to accidents at work, details of training, work history, travel to/from work, labour migration etc.);
- introducing a regular programme of specialised household surveys (informal sector, household budget, child labour);
- improving business surveys (e.g., separate surveys for employment, extending existing surveys to include labour turnover and unfilled job vacancies, enlarge coverage to all business sectors);
- improving existing statistics based on administrative records (content, definitions, classifications, coverage, frequency, reporting accuracy, quality checks) or compiling statistics from untapped administrative records (e.g., social security records, industrial relations reports and registrations, public sector records etc.).

In addition, collaboration between ministries, other statistical producers/users and the NSO should always be encouraged. Moreover, overall management of the data flows and the implementation of a sustainable and modern information system is an issue in many partner countries. In some countries, administrative records are not yet available in an electronic format.

The choice of which improvements or developments to focus upon should be based on the particular country priorities and directly linked with the user needs. Indeed, all potential actions should be complemented by an improvement of statistical analyses and of the relevance to user needs and priorities. It should also be kept in mind that, the more labour market statistics are used for current political issues, the more political awareness is raised and more use is made of labour market statistics when discussing, formulating and implementing policies. This should in turn raise the political awareness of the need to improve statistical capacity, both generally and specifically for labour market statistics. In this framework, organization of user/producer workshops to encourage communication between these parties and of training workshops to guide users in how to make better use of labour market statistics might be considered.

The European Union represents a pioneering experience not only in relation to the methodological contributions and the factual achievements on the labour force surveys, but also for its work on the modernisation and coordination of the administrative sources, such as the Network of Public Employment Services (PES), and the introduction of innovative tools to measure the short-term trends in the labour market, like the European Labour Market Barometer (see box E.16.7).

On the other side, by looking at the experience of different regions in the world, a lot of work is needed to create reliable and functioning labour market systems. As shown in box E.16.8, the implementation of the Labour Market Information Systems (LMIS) in the African context generally represents a crucial issue, despite of any existing and valuable efforts by the international community aiming at building, strengthening or improving them.

Box E.16.7: The EU Network of Public Employment Services (PES) and the EU Labour Market Barometer (EU-LMB)

An innovative tool in the field of labour market statistics offered and implemented by the European Union is the European Network of Public Employment Services (PES). Introduced in 2014, the PES Network aims at enhancing the co-operation between the public employment services in Europe. It currently comprises the EU-27 Member States, Iceland, Liechtenstein, Norway and the European Commission.

The core mission of the PES Network is to ensure the modernisation of the national public employment services by implementing the use of ICT, strengthening the data sources, and assisting them in their supporting activities to EU policies and strategies. This should ensure more effective labour market functions, supporting labour demand with valuable labour market information as well as labour supply in job searching and skills development.

An innovative tool has been introduced by the PES Network to monitor the EU labour market: the European Labour Market Barometer (EU-LMB), published for the first time on 20 October 2020. Following the successful experience of the Labour Market Barometer adopted by the Federal Employment Service in Germany, this indicator is intended to predict the short-term development of employment and unemployment in Europe.

The EU-LMB is based on a survey conducted on a monthly basis among the local branches of the employment services in the European countries. These branches are questioned about the expected developments of employment and unemployment in their areas of competence within the coming three months. Five options of answer are possible on a five-level scale with the extreme values "Decline strongly" and "Increase strongly". Answers weighted for the size of the local districts are aggregated at the national level and standardised on a scale from 90 to 110. The minimum of 90 corresponds to a very bad outlook while the maximum of 110 means a very good outlook; the value of 100 corresponds to neutrality, meaning that both components (Employment and Unemployment) are foreseen to be stable within the next three months. The barometer expresses the mean of the two components. Values at national level are used to calculate the barometer at the European level. In this regard, the values of each component (Employment and Unemployment) are weighted by the population of countries and then averaged to produce the European Labour Market Barometer.

Thus, the EU-LMB has considerable predictive power, especially for unemployment. A high indirect correlation has been shown between the value of the barometer and the dynamics of unemployment in the following three months, by analysing a wide set of data between 2018 (pilot phase) and 2020 at European level.

In September 2020, the overall value of the LMB in Europe stood at 98.7, where the indicator for the seasonally adjusted unemployment was 99.5 and the indicator for employment was 98.0. The crisis due to the impact of COVID-19 produced a barometer value of 93.5 in April 2020, equivalent to a decline of 6.9 points compared to March 2020.

To know more:

- European Union: Network of Public Employment Services (PES) (website)
- Institute for Employment Research (AIB): the European Labour Market Barometer (website)

Box E.16.8: Harmonisation and Co-ordination Framework for the Labour Market Information System in Africa. Follow-up of the Ouagadougou 2004 Plan of Action

The Labour Market Information System Co-ordination and Harmonisation Framework Project (LMIS/CHP), approved by the African Union (AU) in April 2011, was a fundamental tool to ensure the implementation of the Ouagadougou 2004 Plan of Action for Promotion of Employment and Poverty Alleviation. However, with some exceptions, no consistent progress seemed to have been recorded in the course of the following years. Among the key constraints in this regard were in particular the lack of adequate financial and human resources as well as the weakness, including poor coordination, of the labour market institutions.

The follow-up report of the Ouagadougou 2004 Plan of Action and the Ouagadougou 2004 + 10 Plan of Action (September 2014) was approved at the 24th AU Assembly. Six priority areas were identified for the new plan: "(i) Political Leadership, Accountability and Good governance; (ii) Youth and Women Employment; (iii) Social Protection and Productivity for Sustainable and Inclusive Growth; (iv) Well-functioning and inclusive Labour Market Institutions; (v) Labour Migration and Regional Economic Integration; (vi) Partnership and Resource Mobilization".

As regards the priority area (iv) "Well-functioning and inclusive Labour Market Institutions", the key strategies envisaged that the expected outcome (Enhanced and modernised labour market institutions) were identified at three levels – the AU member states, the African Union Commission (AUC) and the regional communities (RECs). This is reported below:

- At the national level: "Develop and strengthen synergies and complementarities among the key labour market stakeholders, enabling the Public Employment Services to act as a hub for the improvement of services provision on self-employment and intermediation interventions; Establish and strengthen Employment and Human Resource planning, monitoring and evaluation units (….); Reinforce the labour market institutions and improve their professionalization; Implement the Labour Market Information Systems Harmonization and Coordination Framework; Undertake institutional, legal and other labour markets reforms to enhance employment and growth, ensure the inclusion of vulnerable groups, including people with disabilities, people with HIVs, migrants' workers and internally displaced persons"
- At the AUC level: "Undertake assessment of the African Regional Labour Administration Centres and upgrade them as specialized African structures to support AU Policies on labour, employment, social protection and migration (…). Strengthen the capacity of African labour market institutions to identify future skills and vocational training needs for inclusive growth and regional economic integration."
- At the regional level (RECs): "Support the establishment of national tripartite coordinating committees on employment and labour issues to coordinate with RECs; Support or facilitate the establishment of national structures on Labour Market Information Systems"
- The work of the implementation of the labour market information systems in Africa is progressing and – as also shown by previous experiences – the African countries can rely on the technical and financial support of a number of cooperation programs already put in place by both international agencies and consortia (e.g., ILO, UNDP, USAID, World Bank, European Union, PARIS21) and national development agencies.

An example of technical assistance is the study developed by Sorensen and Mas (2016), upon request of the African Union. Following the process initiated with the Ouagadougou Plan of Action, this study provided a Roadmap for the Development of Labour Market Information Systems in Africa. It was shown that most LMISs in Africa were still weak, because of a general lack of financial and human resources, lack of reliable data even at basic level (e.g., main indicators from LFS) and a low demand by internal labour market actors (notably, the private sector). Moreover, the national statistical offices, which are normally in charge of the LMIS, seemed scarcely coordinated with other data providers and policy makers and needing more resources to ensure and accomplish their duties. Other gaps related to the information provided: the data were generally not accurate and not updated, ignoring the informal sector (which in most African countries represented more than 80% of the value of the whole economy) and weak dissemination of the information produced. This seemed to limit the potential of development of the LMIS. In order to improve and strengthen the African LMIS, the study recommended to:

- Increase the support by high-level decision makers
- Use or better use the current administrative sources (e.g., trade registries, public services, trade associations, immigration services, education institutions)
- Integrate LMIS information with analytical inputs (e.g., analysis of economic contexts and trends)
- Enlarge the knowledge of the informal sector (through, for example, microfinance institutions, municipalities and tax authorities, trade associations)
- Focus more on data at the local level
- Strengthen partnerships with research institutions and the private sector
- Follow an open data approach (e.g., sharing and improving the existing databases)

To know more:

- African Union (AU): *Report on the Follow-up on the Ouagadougou 2004 Summit: Employment, Poverty Eradication and Inclusive Development in Africa*, Assembly of the AU, 24th Ordinary Session, Addis Ababa, 30-31 January 2015
- The Africa – EU Partnership: *Towards Harmonised and Coordinated Labour Market Information Systems* (website)
- The Africa – EU Partnership: *Pan African Statistics* (website)
- Sorensen K and Mas J.M.: *A Roadmap for the Development of Labour Market Information Systems*, USAID – Workforce Connections - African Union - FHI360 (2016)

To find out more…

Methodologies, concepts and definitions

- European Statistical System (ESS): Quality Assurance Framework of the European Statistical System, version 2.0 (2019)
- Eurostat - European Statistical System (ESS): European Statistics Code of Practice
- Eurostat: Concepts and Definitions
- Eurostat: collection of Statistics Explained articles on the Labour Market
- Eurostat: Labour market glossary
- Eurostat: Labour Market (including Labour Force Survey) - Overview
- Eurostat: Employment and Unemployment (LFS) – Methodology - Main Concepts
- Eurostat: National Accounts - an Overview (Statistics Explained article)
- Eurostat: European Statistics of Accidents at Work (ESAW) – Summary Methodology – 2013 edition
- International Labour Organization (ILO): Concepts and definitions
- International Labour Organization (ILO): Quick guide on sources and uses of statistics on occupational safety and health (2020)
- International Labour Organization (ILO): COVID-19: Guidance for labour statistics data collection. Essential labour force survey content and treatment of special groups (Rev. 1), Technical Note, 30 April 2020
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- International Labour Organization (ILO): Quick guide on measuring economic characteristics in the population census (2019)
- International Labour Organization (ILO): Quick Guide on Sources and Uses of Labour Statistics (2017)
- International Labour Organization (ILO): Decent Work
- International Labour Organization (ILO): Informal Economy
- International Labour Organization (ILO): NORMLEX - Information System on International Labour Standards
- International Monetary Fund (IMF): Data Quality Assessment Framework
- Organization for Economic Co-operation and Development (OECD): Glossary of Statistical Terms
- Organization for Economic Co-operation and Development (OECD): The Non-Observed Economy in the System of National Accounts, Statistics Brief 2014, N. 18
- Organization for Economic Co-operation and Development (OECD): Measuring the Non-Observed Economy. A Handbook (2002)
- United Nations Statistics Division (UNSD): System of National Accounts (SNA) 2008

International classifications

- Eurostat: NACE Rev. 2
- International Labour Organization (ILO): International Classifications of Status in Employment and Status at Work (ICSE and ICSaW)
- International Labour Organization (ILO): International Standard Classification of Occupations (ISCO) – ISCO-08
- United Nations Educational, Scientific and Cultural Organization (UNESCO): International Standard Classification of Education (ISCED) - 2011
- United Nations Statistics Division (UNSD): International Standard Industrial Classification of all Economic Activities (ISIC)

Data sources

- Eurostat: Employment and Unemployment (LFS) - Database
- Eurostat: Employment performance monitor – indicators
- Eurostat: collection of Statistics Explained articles on Labour Market Statistics by Area and Region
- Eurostat: Skills-related statistics
- Eurostat: Sustainable Development Indicators- Goal 8 Decent Work and Economic Growth
- International Labour Organization (ILO): ILOSTAT
- International Labour Organization (ILO): Labour Market Information Systems (LMIS)
- International Labour Organization (ILO): Labour Statistics for the Sustainable Development Goals (SDGs)
- Organization for Economic Co-operation and Development (OECD): Employment Database
- World Bank: Aspire: The Atlas of Social Protection Indicators of Resilience and Equity
- World Bank: Jobs Diagnostics: Data, Tools and Guidance
- World Health Organization (WHO): Global Health Observatory Data Repository

Other relevant research and reports

- European Training Foundation (ETF): Labour Market Information Systems. Collecting Information and Data on Labour Market Trends (2019)
- International Labour Organization (ILO): World Employment and Social Outlook. Trends 2023 (2023)
- International Labour Organization (ILO): Social Dialogue, Skills and Covid-19. The Global Deal for Decent Work and Inclusive Growth Flagship Report (2020)
- International Labour Organization (ILO): Resources
- Organization for Economic Co-operation and Development (OECD): Employment Outlook
- PARIS21: Labour Market Data Sources towards Digital Technical and Vocational Education and Training (TVET) (2018)
- SOCIEUX+ Expertise on Social Protection, Labour and Employment (EU): 2020 Labour Market Vision : Labour Market Information Systems for the New Decade (2019)

Main international cooperation and development activities

- African Union (AU): Report on the Follow-up on the Ouagadougou 2004 Summit: Employment, Poverty Eradication and Inclusive Development in Africa, Assembly of the AU, 24th Ordinary Session, Addis Ababa, 30-31 January 2015
- European Commission and International Labour Organization: Conclusions of the 15th High Level Meeting (HLM), Geneva-Brussels, 2 October 2020
- European Union: Network of Public Employment Services (PES)
- Eurostat: International cooperation – Overview
- Eurostat: Reports on Reviews
- Institute for Employment Research (AIB): European Labour Market Barometer
- International Household Survey Network: Projects
- International Labour Organization (ILO): Decent Work and the 2030 Agenda for Sustainable Development
- International Labour Organization (ILO): Labour Market Information Systems (LMIS) thematic area
- International Labour Organization (ILO): Employment, Labour Market and Youth Branch (EMPLAB)
- International Institute for Sustainable Development (IISD / SDG Knowledge Hub: SDG 8 Review Highlights Need for Life-long Learning, Leaving No Worker Behind
- Luxembourg Income Study Database
- PARIS21: National Strategy for the Development of Statistics (NSDS) Guidelines
- Sorensen K and Mas J.M.: A Roadmap for the Development of Labour Market Information Systems, USAID – Workforce Connections - African Union - FHI360 (2016)
- World Bank : Labor Markets

ILO: Conventions and Recommendations (ILS); Resolutions and Guidelines (ICLS)

- International Conference of Labour Statisticians (ICLS): ICLS Documents
- 20th International Conference of Labour Statisticians (ICLS), Geneva 10-19 October 2018: Report III – Final Report of the Conference (2019); Data Collection Guidelines for ICSE-18 (2018); Report II – Statistics on work relationships (2018); Report I – General Report (2018); Revision of the 15th ICLS Resolution concerning statistics of employment in the informal sector and the 17th ICLS guidelines regarding the statistical definition of informal employment (2018)
- Recommendation n. 204 concerning the transition from the informal to the formal economy (2015)
- 19th International Conference of Labour Statisticians (ICLS), Geneva 2-11 October 2013: Resolution concerning statistics of work, employment and labour underutilization (2013)
- 18th International Conference of Labour Statisticians (ICLS), Geneva, 24 November – 5 December 2008: Resolution concerning further work on the measurement of decent work (2008)
- 17th International Conference of Labour Statisticians (ICLS), Geneva 24 November – 3 December 2003: Guidelines concerning a statistical definition of informal employment (2003)
- 16th International Conference of Labour Statisticians (ICLS), Geneva, 6-15 October 1998: Statistics of occupational injuries (1998)
- 15th International Conference of Labour Statisticians (ICLS), Geneva, 19-28 January 1993: Resolution concerning statistics on employment in the informal sector (1993); Statistics on strikes, lookouts and other forms of industrial actions (1993)
- Labour Statistics Convention (N. 160) (1985)

Employment and Sustainable Development Goals (SDGs)

- International Labour Organization (ILO): Decent Work and the Sustainable Development Indicators. A Guidebook on the Sustainable Development Indicators (2018)
- United Nations Statistics Division (UNSD): Goal 8 Decent Work and Economic Growth
- UN Statistics Division (UNSD): Sustainable Development Goals indicators database
- United Nations Statistics Division (UNSD): Global indicator framework: annual refinements E/CN.3/2018/2, E/CN.3/2019/2 and 2020 Comprehensive Review changes and annual refinements E/CN.3/2020/2

Labour Force Survey (LFS)

- Eurostat: EU Labour Force Survey (Statistics Explained article)
- Eurostat: Employment and Unemployment (LFS) - Overview
- Eurostat: EU labour force survey – development and history
- Eurostat: EU labour force survey – new methodology from 2021 onwards (Statistics Explained article)
- Eurostat: Employment and Unemployment (Labour Force Survey) – Metadata
- Eurostat: EU Labour Force Survey Database User Guide (2023)
- Eurostat: EU Labour Force Survey Database User Guide (data up to reference year 2020) (2021)
- International Labour Organization (ILO): Labour Force Survey (LFS) - Resources
- International Labour Organization (ILO): LFS Research and Development
- International Labour Organization (ILO): Labour Force Surveys (Catalogue)

F

Guide to statistics in European Commission development cooperation

ECONOMIC STATISTICS

F.17 National accounts

F.17. National Accounts

The chapter in brief

The main focus of this chapter is National Accounts, dealing with topics like implementation of the 2008 System of National Accounts (2008 SNA).

This chapter defines Gross Domestic Product (GDP) and Gross National Income (GNI) and gives a short overview of the institutional sector accounts and the Supply and Use Tables. It also summarizes the statistical data required for the National Accounts compilation in current and "constant prices", now called "volumes" in the SNA.

The monitoring of a country's economy requires up-to-date and reliable National Accounts information on the structure of the economy and the developments of its branches and its expenditure and income aggregates. The information should comply with international recommendations as given in the 2008 SNA and therefore be comparable with the National Accounts for other countries in the same region and for other ACP and ALA countries.

The Non-Observed Economy is discussed, as well as the production boundary which draws a line between what should be included in the National Accounts concept of production and what should be excluded.

Besides globalization, digitalization, sustainability, e-commerce, or communication, the treatment of the informal economy is among the topics which during the last years have gained relevance for economic analysis and, hence, have received special attention in the 2025 version of the SNA.

F.17.1. Policy applications: what these statistics are used for

National Accounts are the core of a modern system of economic statistics. They are the main instrument for observing the economy as a whole, for measuring economic growth, and for designing macroeconomic policy. Hence, the National Accounts provide key policy indicators.

International organisations, analysts and policy makers pay attention to the structure and development of GDP and to its components such as final consumption, capital formation, saving, etc.

Since the outbreak of the Covid-19 pandemic in 2019 and the subsequent disruptions of short-term economic business cycles, the demand for infra-annual National Accounts figures has rapidly increased in many low- and middle-income countries.

To meet these demands, National Accounts figures highly depend on the quality of the statistical system they are based within. International comparisons must heed that the quality of National Accounts in terms of scope and reliability may differ between countries.

Box F.17.1: Historic and prevailing versions of the System of National Accounts (SNA) and the European System of Accounts (ESA)

The objective of both the System of National Accounts (SNA) and the European System of Accounts (ESA) is to provide a comprehensive conceptual and accounting framework for compiling and reporting macroeconomic statistics for analysing and evaluating the performance of an economy.

Both systems have evolved over the years and their evolution is reflected in the documents listed below and discussed in the reminder of the box.

Document	Geographical scope	
1953 SNA	Worldwide	
1968 SNA	Worldwide	
1993 SNA	Worldwide	
ESA 1995		EU Member States
SNA 2008	Worldwide	
ESA 2010		EU Member States

The 1953 SNA was published under the auspices of the UN Statistical Commission (UNSC). It consisted of a set of six standard accounts and a set of 12 standard tables presenting detail and alternative classifications of the flows in the economy. Its very first two sentences are still valid: "The production, distribution and use of goods and services involves many complex processes and to understand these processes better an increasing amount of information is being gathered all over the world. All this information belongs to the realm of economic statistics."

The 1968 SNA (the Blue Book) extended the scope of the National Accounts substantially by adding chapters on supply and use tables, input output tables, complete institutional sector accounts and balance sheets. It gave more attention to estimates at constant prices. With the 1968 SNA, a comprehensive effort was made to bring the SNA and the Material Product System (MPS), used in the centrally planned economies, closer together.

The 1993 SNA represented a major advance in national accounting and embodies the result of harmonizing the SNA and other international statistical standards more completely than in previous versions. The 1993 SNA is co-signed by the United Nations, the International Monetary Fund, the OECD, the World Bank, and the European Commission.

In 2003, the United Nations Statistical Commission called for an update of the 1993 SNA to bring it into line with the new economic environment, advances in methodological research and user needs.

The European System of National and Regional Accounts (ESA 2010) is the internationally compatible EU accounting framework for a systematic and detailed description of an economy. The ESA 2010 was published in the Official Journal on 26 June 2013, it is an EU law (Regulation (EU) No 549/2013 of the European Parliament and of the Council[1]). It is compatible with the 2008 SNA and is enriched by a transmission programme, intended to provide the legislative basis for the EU member countries for the transmission of National Accounts data to Eurostat from 2014 onward.

Essential objectives of both the 1993 SNA and the 2008 SNA are harmonisation between the National Accounts system and other related systems of statistics such as IMF Balance of Payment Statistics, IMF Government Finance Statistics and IMF International Financial Statistics.

Presently, preparations for the next revision of the SNA (expected to be the 2025 SNA) are underway. Analyses of topics for the update have been published as "Guidance Notes".

1 Regulations are legal acts that apply automatically and uniformly to all EU countries as soon as they enter into force, without needing to be transposed into national law. They are binding in their entirety on all EU countries.

Box F.17.2: Luxembourg Recommendations on Global Implementation and Outreach for the System of National Accounts)

Following the request of the United Nations Statistical Commission, Eurostat and the UN Statistics Division organised a high-level conference on "International Outreach and Coordination in National Accounts for Sustainable Growth and Development" in 2008. The conference adopted the "Luxembourg Recommendations on Global Implementation and Outreach for the System of National Accounts". The Luxembourg Recommendations are still relevant. They outline the principles and recommendations for the global implementation and outreach programme for the SNA in low- and middle-income countries, to be implemented by the Regional Commissions of the United Nations. They are grouped along the three distinct principles of "Managing for Development Results":

(a) Strategic planning principle – Mainstreaming strategic planning for the development of national accounts and related basic statistics.

Best practices are readily available on how to design strategic planning frameworks for the development of statistics. One example is PARIS 21's guidelines on National Strategies for the Development of Statistics (NSDSs) (see section C.7.1.). Others are the United Nations Development Assistance Frameworks (UNDAFs), the IMF's General Data Dissemination System (GDDS), the World Bank's Country Assistance Strategies (CAS), and World Bank/IMF Poverty Reduction Strategy Papers (PRSPs).

Recommendation 1 – Strategic planning frameworks

A strategic planning framework should be formulated for national statistical capacity in national accounts and other economic statistics. This should be integrated with balance of payments, government finance statistics and environmental economic accounting etc. The framework should be a component of the National Strategy for the Development of Statistics (NSDS), be regularly updated, and be consistent with the GDDS and other reference frameworks of the country. National, regional and international strategies on economic statistics should be synchronized, and actions determined by information from strategic planning frameworks and other mechanisms. Further alignments have to be pursued according to various frameworks.

(b) Coordination, monitoring and reporting principle – Coordinating the programming, monitoring of and reporting on the strengthening of the statistical infrastructure for economic statistics.

Recommendation 2 - Coordination, monitoring and reporting

Regional Commissions … play a central role in the coordination, monitoring, reporting and maintenance of existing mechanisms. The aim is to enhance the efficiency of technical cooperation programmes and alignment with national commitments for development of official statistics. … South-South cooperation should be further developed.

Recommendation 3 - Global governance

A global governance structure should be created to develop coordination, monitoring and reporting procedures, to avoid duplication, to assess performance of the implementation programme and the progress of countries/regions against set benchmarks. This structure could take the latest International Comparison Program (ICP) round as a model. ….

(c) Statistical system improvement principle - Improving the national, regional and international statistical system

Recommendation 4 - National statistical capacity building

National statistical capacity building in national accounts and related economic statistics should be achieved through a unified implementation programme. This includes development of statistical infrastructure, sustainable donor activities, technical assistance, training capacity and application of common standards and software tools (e.g., SDMX and ERETES). Common training modules in national accounts and related statistics, including distance learning, should be developed. Promotion and adaptation of national accounts data for policy purposes underpin strategic planning frameworks.

Recommendation 5 – SNA Knowledge Platform: statistics, information technology and management

A SNA knowledge platform should be established on statistical standards, training programmes and best practices, information technology tools and management for national statistical systems. ….

The implementation of the Luxembourg Recommendations should result in improved national statistical capacity for low- and middle-income countries, including enhanced quality of statistics, better conceptual compliance, harmonization and improved comparability of statistics, strengthened coordination, monitoring and reporting between donors and recipient countries, and more intensive and appropriate use of national accounts in policy making.

The Luxembourg Recommendations have led to a Global Implementation and Outreach Programme for the SNA, adopted by the UN Statistical Commission in 2009

F.17.2. National Accounts concepts and definitions

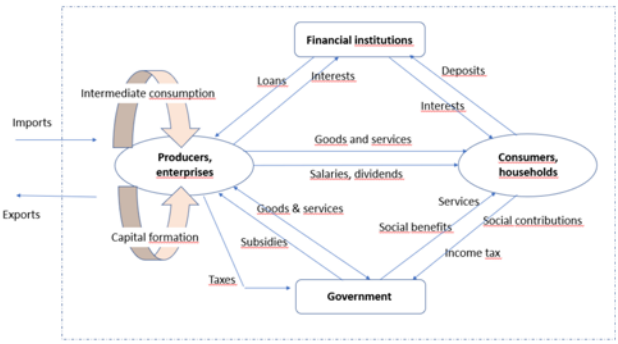
F.17.2.1. GROSS DOMESTIC PRODUCT (GDP) AND GROSS NATIONAL INCOME (GNI)

F.17.2.1.1 Gross domestic product (GDP)

The SNA provides information about economic activities taking place within a period in a given economy and about the levels of an economy's assets and liabilities, usually referred to as "National Accounts". The National Accounts represent a broad and comprehensive statistical system aimed at describing a national economy and how it works. Data on economic activities are grouped and classified to provide macro-economic aggregates for the main actors in the economy: producers / enterprises, financial institutions, government and households / consumers. The arrows in the figure that follows show the main transactions they are involved in.

Enterprises produce goods and services and sell them (mainly) to households, to the government, or to other countries (exports). Their products may as well serve as intermediate consumption within the physical process of production or for the formation of physical ("fixed") capital. Enterprises usually pay taxes and some of them may get subsidies from the government. Enterprises pay loans and salaries to their employees and dividends and other forms of withdrawals to (mainly) households. Households purchase goods and services, pay income tax and social contributions and receive various kinds of social benefits. As society at large, the households consume the services produced by the general government. Financial institutions provide loans and receive interest in return. They accept deposits mainly from households and pay interest to them. Imports of goods and services usually complete the supply of goods and services used up in the economy.

The figure has been kept simple and handy by omitting some of the transactions between the actors in the system. For example, financial transactions between the banks and the government or foreign aid, foreign direct investment, or remittances sent by family members working abroad remain unshown.



It should be noted that this figure, like many similar graphs in economic textbooks, pictures the full economic circuit, with the arrows showing the direction of the transactions, e.g., output of goods or services provided to households for consumption or to other enterprises for internal use during production or for capital formation. However, National Accounts refrain from answering the question of "from whom to whom", mainly because of lack of information: producers usually do not know how much of their output is used by households, by the government, by other countries or by other producers, and, similarly, customers usually are unable to specify the economic origin of the goods they are purchasing. Hence, the supply of goods and services (output or imports) is not further split by use categories like consumption or capital formation, and vice versa. The SNA concept applies a "goods and services account" where all transactions for the calculation of GDP are balanced in a so-called dummy account.

In the table that follows the main concepts of the 2008 SNA are grouped by those questions the National Accounts are designed to answer. The table provides the analytical interest the questions stand for.

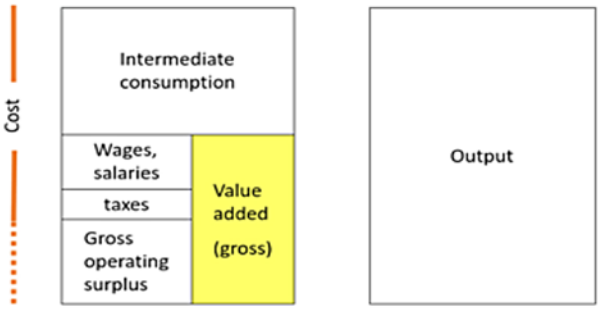
Question	Explanation	SNA concepts
Who?	Refers to the economic agents (institutions, firms, individuals) that perform activities in the economy	• Institutional units • Institutional sectors • Total economy and the rest of the world
What?	Refers to the transactions and other flows and stocks, which are the objects of the economy	• Transactions and other flows • Assets and liabilities • Products and producing units
Why?	Classifications by purposes of expenditure	• Institutional units • Institutional sectors • Total economy and the rest of the world
How?	Refers to the recording of who, what and why.	Accounting rules: • recording • time of recording • valuation • consolidation and netting

The most commonly used indicator in the National Accounts is the **Gross domestic product (GDP)**.

- "Gross" means that no deductions are made for the using up of physical assets during the process of production or for the degradation of natural resources.
- "Domestic" means that GDP measures economic activity carried out inside the economic territory of the country, regardless of whether by residents or by non-residents.
- GDP can be compiled by the production approach, by the income approach, or by the expenditure approach (or by more than one of these).

- GDP by the production approach is the sum of gross value added at basic prices by all resident producers in the economy (institutional sectors or industries) plus all taxes (less subsidies) on the products.

Gross value added (GVA) is a measure of the contribution to GDP made by an individual producer, by an institutional sector or by an industry. It must not be confused with the profits as per commercial bookkeeping. The scheme illustrates the differences, using the terms of the SNA.



For short: both GVA and profits are balancing items. But output differs from "sales" or "turnover", and in commercial bookkeeping "cost" includes positions like certain indirect taxes or interest payments which in GVA are part of the operating surplus. Hence, not even the operating surplus is identical with "profits". Moreover, consumption of fixed capital (a component of gross value added) is not the same as what "depreciation" means for the accountants of the individual producers.

Exploiting commercial bookkeeping is key to calculating GDP or other macro-economic aggregates of National Accounts. But for compiling GDP as the most relevant indicator, it needs many other data sources. GDP may be calculated in the three different approaches as presented in a scheme (source: table 3.4 Main aggregates in SNA, in Eurostat's 'Essential SNA: Building the basics').

Production Approach (1)	Expenditure Approach (2)	Income Approach (3)
+ Sum of values added at basic prices of all producers + Taxes on products - Subsidies on products	+ Gross fixed capital formation + Changes in inventories + Exports of goods & services - Imports of goods & services	+ Compensation of employees + Taxes on production and imports - Subsidies on production + Operating surplus / mixed income
= Gross domestic product (GDP) at market prices (I) – Consumption of fixed capital = Net domestic product		Can also be calculated as the sum of the balance of primary incomes of all institutional sectors
(I) + Primary incomes receivable from the rest of the world – Primary incomes payable to the rest of the world		
= Gross national income (GNI) at market prices (II) – Consumption of fixed capital = Net national income at market prices		Can also be calculated as the sum of the disposable incomes of all institutional sectors
(II) + Current transfers receivable from the rest of the world – Current transfers payable to the rest of the world		
= Gross national disposable income (GNDI) at market prices (III) – Consumption of fixed capital = Net national disposable income at market prices		Can also be calculated as the sum of the disposable incomes of all institutional sectors

Source: System of National Accounts 1993, Training manual, SADC, 1999

GDP in current prices per capita is used as a broad measure of living standards, although there are several international statistical initiatives to provide alternative and more inclusive measures. The European Commission released a Communication in 2009, GDP and beyond - Measuring progress in a changing world, which addressed the need for complementary indicators (alongside GDP) for the global challenges of the 21st century such as climate change, poverty, resource depletion, health and quality of life. In 2013, the European Commission's "road map" was updated by a Staff Working Document on "Progress on 'GDP and beyond' actions". In the forthcoming revision of the SNA ("2025 SNA"), these aspects will be specifically addressed.

GDP is also calculated in volume terms (based on previous year's prices or on prices of a base year). The SNA 2008 favours the option to calculate volumes in the prices of the previous year, also called "chaining". A minority of low- and middle-income countries use the chaining method. Most of them calculate GDP at "constant prices" by using the price levels of a base year which can be earlier than the previous one.

GDP in volume terms is intended to allow comparison of economic growth and development over time, since the impact of price developments (inflation) has been removed.

Output at constant prices can be obtained by multiplying quantities in the current year with the prices of the base year, often practiced for the output of agriculture or mining or electricity.

Output at constant prices may also be obtained by using price indices as deflators, to be applied to the values of the current years.

If GDP at current prices is divided by GDP at constant prices, the result would be the "GDP deflator", a measure which results from the National Accounts. It is a special aggregated impact of price effects in the economy.

The annual growth rate of GDP in volume terms is the most important economic indicator for most low-income countries, often depending on the primary sector of the economy (agriculture, forestry, fishing and mining) as these industries usually have much more weight than in the industrialized countries.

F.17.2.1.2. Gross national income (GNI)

While GDP (measured from the income approach) refers to primary incomes accruing from domestic production, GNI refers to primary income of resident households and resident producing units, regardless of whether these incomes stem from domestic or from foreign production. Primary incomes are incomes directly linked to production (labour income, operating surplus, taxes (less subsidies) on products) or to the ownership of assets that may be needed for purposes of production:

GNI is equal to GDP less primary incomes payable to non-resident units plus primary incomes receivable from non-resident units. In other words, GNI is equal to GDP less taxes (less subsidies) on production and imports, compensation of employees and property income payable to the rest of the world plus the corresponding items receivable from the rest of the world. Thus, GNI is the balance of primary incomes receivable by resident institutional units or sectors.

F.17.2.2. THE DOMESTIC INSTITUTIONAL SECTORS AND THE REST OF THE WORLD

An institutional unit is an economic entity that is capable in its own right, of owning assets, incurring liabilities and engaging in economic activities and in transactions with other entities.

The institutional sectors of the SNA are groups of similar kinds of institutional units. In the SNA, they are the groups for which the so-called "institutional sector accounts" are compiled. For each sector, these accounts describe the stages of the economic process and how income is generated, distributed, redistributed and used for consumption or acquisition of assets.

The six institutional sectors in the SNA are:

- Non-financial corporations,
- Financial corporations,
- General government,
- Households,
- Non-Profit Institutions Serving Households (NPISH),
- Rest of the world

The SNA foresees a more detailed subdivision of the domestic institutional sectors.

An overview of the sequence of accounts for institutional sectors:

- The production accounts
- The distribution and use of income accounts
- The accumulation accounts
- Balance sheets

The institutional sector accounts do not themselves answer the question "who delivers to whom?" in transactions in products. This information - all counterpart entries of transactions in products – is presented by a summary account called the "goods and services account" with the resources on the right-hand side of the table and the uses on the left-hand side (figures as per SNA, table 2.15):

USES		RESOURCES	
Intermediate consumption	1 883	Output	3 604
Final consumption expenditure	1 399	Imports of goods and services	499
Gross capital formation	414	Taxes on products	141
Gross fixed capital formation	376	Subsidies on products (-)	- 8
Intermediate consumption	1 883		
Final consumption expenditure	1 399		
Gross capital formation	414		
Gross fixed capital formation	376		
Changes in inventories	28		
Acquisitions less disposals of valuables	10		
Exports of goods and services	540		
Total uses	4 236	Total resources	4 236

If information about the delivery chains within the economy and with the rest of the world is required, the appropriate tool would be a Supply and Use Table (see next section). If the analytical interest is focused on segregating distributive transactions between the sectors or their sub-sectors, a Social Accounting Matrix (SAM) may be compiled.

F.17.2.3. NATIONAL ACCOUNTS WITH SUPPLY AND USE TABLES (SUT)

The SUT focus is on the product balances: where do products come from, and where – and for what purpose – are they used. Products are both goods and services.

The producers on the supply side and the intermediate consumers (corporations or other producers) on the use side are classified by economic activity, in the SNA called "industries". The final users are the institutional sectors general government, households, and NPISH.

Gross capital formation is further bifurcated in gross fixed capital formation, changes in inventories, and acquisition less disposals of valuables (such as jewels, precious metals, or other work of art). These sub-categories may be further subdivided by sector (e.g., gross fixed capital formation separately for the government and/or the corporation sectors and NPISH) or even sub-sectors.

SUPPLY	USES
Domestic production	Intermediate consumption
Imports	Final consumption
	Gross capital formation
	Exports

As output and imports are recorded at basic and import prices respectively, some columns are needed in the SUT to bring the value of supply into line with the value of these products on the use side (which is recorded at purchasers' prices). Hence, the taxes (less subsidies) on the products and the price margins for trade and for transport of the goods are to be added on the supply side in separate columns.

For some countries, Supply and Use Tables are fully integrated in the National Accounts system and serve both statistical and analytical purposes. Several countries are using SUT as an integral part of the compilation of annual National Accounts at current prices. Some of them also do it in previous year's prices or in the prices of a fixed base year.

According to the recommendations given by ISWGNA, SUT should be part of the first "milestone" for SNA implementation.

The balancing of the Supply and Use Tables is often of particular importance for product-level checking of the overall consistency of compiling value added and GDP, especially checking production approach data against the expenditure approach data. The compiler can then use other evidence and professional judgement to reach a balance by adjusting the components as necessary.

SUT compilation incorporates all three approaches for measuring GDP by industry as it shows all output by kind of activity, all imports, all intermediate and final uses of products, and therefore all balancing items and distributive transactions making up the income approach.

SUT are an important tool for constant price estimates as it provides the weighting schemes for producer output price indices as well as for producer input price indices. Having price indices for both output and intermediate consumption enables using the "double deflation" technique which, in contrast to single deflation, allows for differentiating between price changes on the output side and price changes of the inputs.

SUT may also be converted to Input-Output tables (IOT), industry by industry or product by product tables, if required by econometric modelling or economic planning. However, input-output table compilation is rather time-consuming and costly, so most of the low- and middle-income countries confine their efforts to constructing SUT.

The intention to elaborate macro-economic accounting on an in-depth disaggregation by products or industries in SUTs may be accomplished by compiling satellite accounts. Satellite accounts may be directly linked to SUTs or they may stand alone. Satellite accounts may focus on particular industries and products in more detail. A very common example is tourism satellite accounts where results for hotels, restaurants, retail trade and other industries are rearranged to arrive at SNA indicators for "tourism", further disaggregated by countries of origin of tourists or by their duration of stay etc., making

also use of additional information from tourism statistics. The intention is to extend the national accounts to reflect phenomena which are not captured in the national accounts but can be provided by complementary compilation and/or involving additional data sources. Other topics of satellite accounts planned or already materialized in African countries (result of a small survey of the Pan-African Statistics project funded by the EU in July 2020) are health, water, envisaged information technology and social economy, transport, environment, agriculture, financial services.

A special case is the compilation of SUTs or satellite accounts for capturing depletion of natural resources or of environmental aspects at large. If confined to less complex topics like water resources or forestry management, this can be done in the format of a satellite account, i.e., keeping the main aggregates in line with those of the GDP. But since the release of the System of Environmental-Economic Accounting (SEEA), this internationally agreed framework would be the appropriate tool. The SEEA follows an accounting structure similar to the SNA. But its results are not an extension of GDP compilation and thus are not satellite accounts in the strict sense.

F.17.2.4. QUARTERLY NATIONAL ACCOUNTS

For short-term economic analysis, several countries maintain Infra-annual sub-systems of the SNA, most commonly on quarterly basis. There is strictly no difference between quarterly and annual accounts as regards the basic principles to follow. The aim of the quarterly accounts is to provide at the earliest possible moment reliable figures for changes in the major macroeconomic aggregates.

Quarterly accounts are less detailed compared with annual accounts, and their compilation may differ because of different data sources and because of the need to use extrapolations and preliminary estimates rather than final calculations. As the purpose of quarterly results is early information, it is very common to work with preliminary figures which must be revised later. Special attention is needed to benchmark the total of the quarterly results with the annual accounts.

The demand for short-term macro-economic figures in low- and middle-income countries has escalated since the COVID-19 pandemic, with its lockdowns and similar restrictions, has drastically changed the conditions of producing goods and services and of selling and transporting them. Within short notice, many economic activities almost collapsed while a few others grew tremendously. For political decisions to cope with these changes in structure and development of the economy, the demand for sub-annual data on GDP and its growth steeply increased. For the compilers of the National Accounts, it was extremely difficult to meet this demand because at the same time its source data eroded: conducting economic surveys had suffered from absence of statistical staff and, most of all, from problems to get proper data from establishments that were closed or whose staff was working from home.

Box F.17.3: A press release of Statistics South Africa on quarterly national accounts

The following text and figures are extracts from a press-release of Statistics South Africa.

"South African GDP declines by 0,7%

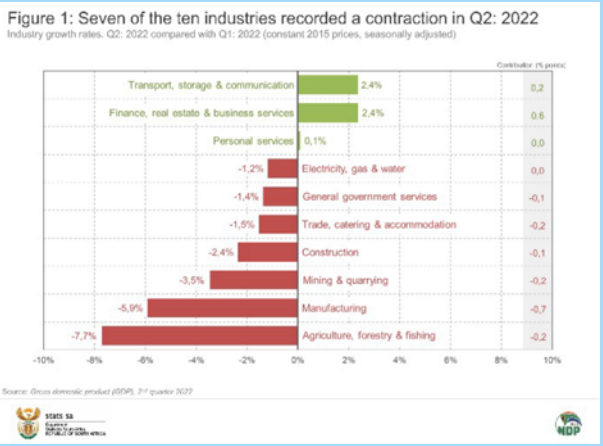
After two consecutive quarters of positive growth, real gross domestic product (GDP) decreased by 0,7% in the second quarter of 2022 (Q2: 2022). The devastating floods in KwaZulu-Natal and load shedding contributed to the decline, weakening an already fragile national economy that had just recovered to pre-pandemic levels.

Manufacturing the biggest drag on GDP

The flooding had a negative impact on a number of industries, most notably manufacturing.

Manufacturing is the largest industry in KwaZulu-Natal, according to 2019 data, accounting for a fifth of national manufacturing production. The damage to factories and plants, and disruptions to logistics and supply chains, pulled national manufacturing output down by 5,9% (Figure 1). The biggest drags on growth were petroleum and chemical products, food and beverages, and transport equipment.

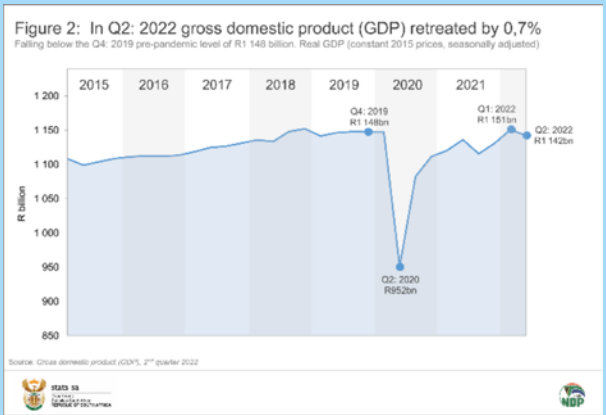
Figure 1: Seven of the ten industries recorded a contraction in Q2: 2022



Economic recovery from COVID-19: Not all industries are equal

The economy took almost two years to recover from the impact of COVID-19, with real GDP reaching pre-pandemic levels in Q1: 2022 (Figure 2). The recovery was short lived, with the 0,7% decline in Q2: 2022 dragging GDP back below the Q4: 2019 pre-pandemic level of R1 148 billion.

Figure 2: In Q2: 2022 gross domestic product (GDP) retreated by 0,7%



Overall, many countries have meanwhile extended their scope of National Accounts to include the quarterly compilation of GDP, at the same time applying methods of seasonal adjustments and improving techniques of benchmarking and of using proxy variables for estimates.

F.17.2.5. REGIONAL ACCOUNTS

In the SNA, Regional Accounts refer to the compilation of GDP for regions below the national level. The general rules of the SNA are valid for Regional Accounts too. However, the transactions of multi-regional units, e.g., activities of ministries, offices, or barracks of general government, or of units of companies with affiliates dispersed over the country, need special attention. As for the quarterly accounts, the problem for regional accounting is to get a match with the national totals of the relevant aggregates. Over the last years, the number of countries compiling regional GDP has increased significantly.

The term "regional accounting" may have a dual meaning, as it is also common to compile the GDP for groups of countries rather than for parts of them, e.g., for countries of a currency union or of a political union. Such results are usually also called "regional", albeit covering countries belonging to the same supra-region.

F.17.3. Implementation of the System of National Accounts

F.17.3.1 IMPLEMENTATION STRATEGIES FOR THE 2008 SNA

National and regional implementation programmes for the 2008 SNA and the supporting statistics are aligned with the global implementation programme for the 2008 SNA, prepared by the ISWGNA for the 42nd session of the United Nations Statistical Commission (UNSC) in 2011. They cover three stages of the implementation of the 2008 SNA through a multi-year programme:

Stage I: Review of strategic framework and detailing of national and regional implementation programmes;

Stage II: Adaptation of classification frameworks, business registers and frames, surveys, administrative data sources and information technology infrastructure; and

Stage III: Application of adapted frameworks and source data, backcasting and change-over to 2008 SNA.

There is a consensus that these programmes should include:

- an assessment of the countries' current capacity to produce supporting statistics for national accounts compilation;
- a roadmap to enhance the scope and quality of basic economic statistics and national accounts;
- a minimum common data set of annual and high frequency statistics with metadata descriptions.

The ISWGNA's Global Implementation Programme also included an update of the so-called "milestones" which are dealt with in the following section.

International and regional organisations facilitate the implementation of the 2008 SNA, especially through the regional implementation strategies (see also box F.17.9). These institutions and other donors are urged to devote greater resources for this purpose. This includes the appointment of experts/advisors on national accounts. It is also important for countries to establish their national implementation programmes for the 2008 SNA and to support statistics in line with the regional and global implementation programmes.

Under the Strategy for the Harmonization of Statistics in Africa, a collective effort of the African Development Bank (AfDB), the African Union Commission (AUC), the UN Economic Commission for Africa (UNECA), and the African Capacity Building Foundation (ACFB), several continent-wide Special Technical Groups have been established. One of them is the African Group on National Accounts (AGNA) aiming at the implementation of the 2008 SNA in Africa. The AGNA prepared a 'Draft African Strategy for the Implementation of the 2008 SNA'. The work of AGNA has been supported by the EU project Pan-African Statistics Programme since 2016 During the second phase of this project (2021-2025), it is intended to revitalize the AGNA as the genuine Special Technical Workgroup under the Strategy for the Harmonization of Statistics in Africa.

Similar approaches have been pursued in other major regions around the world.

F.17.3.2. MILESTONES FOR 2008 SNA IMPLEMENTATION

The SNA framework has two main sets of accounts:

- The institutional sector accounts
- The Supply and Use Tables with goods and services accounts.

Upon request from the UN Statistical Commission, six milestones for the 1993 SNA implementation were defined by the Intersecretariat Working Group on National Accounts (ISWGNA). Only slightly changed, these milestones remained part of the Guidelines for monitoring the implementation of the 2008 SNA, developed by the ISWGNA and as reported to the 42nd session of the UNSC.

According to these guidelines, the milestones should be:

Milestone 1:

Basic indicators of gross domestic product (GDP).

Final expenditure on GDP at current and at constant prices.

GDP by industry at current and constant prices.

Under milestone 1, the complementary data system giving "Supply and Use Table worksheets" is recommended. This establishes consistency between the output approach, the expenditure approach and the income approach. Moreover, the Balance of Payments should provide the current, the

capital, and the finance account, and the Government Finance Statistics (GFS) should provide the transaction accounts.

Milestone 2:

Gross national income and other primary indicators

For the rest of the world, the external account of primary incomes and current transfers, and the capital and finance accounts should be provided,

As complementary data systems under milestone 2, the country should have capital stock estimates, should be able to show its International Investment Position, and should compile GFS transactions and stocks in assets and liabilities, and also monetary and financial statistics.

Under the same milestone, the Guidelines also recommend considering quarterly national accounts, regional accounts and satellite accounts as SNA-related data to be developed.

The other four milestones recommend implementing the institutional sector accounts step by step.

Milestone 3:

For all institutional sectors: Production account

For general government: Generation of income, Allocation of primary income, Secondary distribution income, Use of disposable income, Capital and financial accounts

The production account cross-classified both by institutional sectors and by industries should provide direct links between the Institutional sector accounts and the Supply and Use Tables. It should also ensure consistency between these two parts of the national accounting system.

Milestone 4:

For all institutional sectors: Generation of income, Allocation of primary income, Secondary distribution of income, Use of disposable income, Capital accounts.

Milestones 5 and 6: Financial accounts and capital accounts for all institutional sectors.

The ISWGNA listed the following annual tables and accounts as a minimum requirement for implementation of the SNA:

- Value added and gross domestic product (GDP) at current and constant prices by activity (industry);
- Final expenditures of GDP at current and at constant prices;
- Components of value added by activity (industry);
- Sequence of the institutional sector accounts for the total economy (until net lending);
- Rest of the world account (until net lending).

The ISWGA also recommended:

- Annual Supply and Use Tables
- Quarterly value added and GDP at current and constant prices by activity (industry)

In more detail, the guidelines can be found under https://unstats.un.org/unsd/nationalaccount/docs/guidelines.pdf. A complete list of all milestones can also be found in table 2.4 of Eurostat's 'Essential SNA: Building the basics'.

Many less developed countries have not gone beyond milestone 3 or have not yet coped with compiling the institutional sector accounts at all.

F.17.4. Sources of data for the National Accounts compilation

F.17.4.1. ORGANISATION OF THE STATISTICS

In most countries, the National Statistical Office (NSO) is responsible for the National Accounts. However, one also finds countries where the responsibility lies with the national central bank, or a ministry, or another institution.

Many countries, including many low- and middle-income ones, maintain a special business register for statistical purposes. Such registers are considered to support conducting economic surveys or censuses. A statistical business register has the advantage that its elements, the producing units of the economy, can be classified by sector or industry according to the needs of the National Accounts. And, most of all, such registers are a good prerequisite for being comprehensive and accurate in the economic statistics underlying the compilation of GDP and its aggregates. A statistical business register in the NSO should in principle cover all production units. However, business registers are often confined to non-agricultural activities.

National Accounts compilation relies on various official statistics or secondary data provided by other government departments or by chambers of commerce, associations, and the like. Line ministries such as for agriculture, health and education will often have statistical services. Many NSOs have a formal service-level agreement or memorandum of understanding with other government departments providing data.

The compilation and the balancing of the National Accounts often imply that the compilers are both controlling and correcting the data they use as inputs for their work.

F.17.4.2. DATA SOURCES FOR NATIONAL ACCOUNTS

F.17.4.2.1. Data sources for annual National Accounts in current prices

All available economic statistics and other official statistics like those on population, on housing, education, health etc., also data from government ministries or other secondary sources like associations or chambers of commerce and the like should be used for national accounts compilation. Important data sources are:

- Agriculture censuses and statistics (see chapter G.26)
- Livestock censuses
- Fisheries statistics (see section G.26.2.8)

- Banking statistics and statistics for other financial institutions
- Economic surveys for enterprises or establishments (cut-off selections or samples from list frames or area samples (see chapter F.21)
- Energy statistics
- Government Accounts and Budget Documents (see chapterF.18)
- Labour force survey (see chapter E.16)
- External trade statistics with value and quantity of imports and exports (see chapter F.20)
- Household surveys, often as Household Income and Expenditure Survey or as Household Budget Survey
- Consumer price indices (see chapter F.19), producer price indices,
- Population Census, Housing Census (see chapter E.13)

Statistics for banks and other financial institutions

Statistics for financial institutions usually come from the national central bank and/or from the regulatory agencies supervising the financial market and the insurance companies. The SNA has special rules for compiling and distributing the production of banks, based on interest received and paid on their loans and deposits, respectively, called "Financial Intermediation services Indirectly Measured" (FISIM). FISIM is an imputed output of the banks, with the purpose of shifting parts of their revenues from property incomes (they are not part of GDP) to the goods and services making up GDP. With the imputation of FISIM, the value added of banks gets a share in the GDP, which is appropriate for their economic relevance.

General government budgets and accounts

In National Accounts, three kinds of output are distinguished: market output, non-market output, and output for own final use.

The government may have all three kinds of output. However, the outstanding kind is non-market output. It is the value of most of the services from general government, calculated as the sum of their production costs: intermediate consumption, consumption of fixed capital and compensation of employees. Net operating surplus of government is assumed to be zero.

On the expenditure side, the non-market output is equal to the revenues from such services (fees for visa, passports, and the like) and government final consumption expenditure (the residual).

Government final consumption expenditure should be classified by the Classification of the Functions of the Government (COFOG). For more details, please refer to section B.5.2.9.

Integrated Household Surveys or Household Budget Surveys

When they are available, data from Integrated Household Surveys or Household Budget Surveys can be used for estimating Household Final Consumption Expenditure. For estimating the Household consumption figures, the results from the Household Budget Surveys must be evaluated and compared or balanced with other data sources used for calculating the supply of goods and services (for example retail trade data).

Imports and exports of goods and services

Detailed data for imports and exports of goods and services are of great importance for National Accounts and especially for SUT compilation. They are usually sourced from customs authorities. Eurostat has developed the EUROTRACE software package to manage customs data and to prepare them for external trade statistics (see chapter F.20).

Data on imports and exports of goods and services are also part of the balance of payments (BOP), albeit at a less detailed level. The BOP should be the mirror of the Rest of the world account in the National Accounts. The current account of the BOP measures all current transactions between a country and the rest of the world, including transactions in goods and services (the trade balance), net incomes from abroad as well as international transfers. Capital transactions with the rest of the world are captured in the capital account of the BOP. Remittances are important income from abroad in many low- and middle-income countries. These inflows of money are included in GNI as far as they are earnings remitted by seasonal workers to their families.

The 'Balance of Payments and International Investment Position Manual, sixth edition (BPM6)' is consistent with the 2008 SNA. Good routines for data sharing between the NSO and the central bank, which usually is responsible for compiling the BOP, are required.

F.17.4.2.2. Data sources for quarterly national accounts

Since the disturbances due to the COVID-19 pandemic, many low- and middle-income countries need sub-annual data for GDP and economic growth, even if their resources for statistics are scarce. The production of regular and timely quarterly statistics is costly and requires well-functioning statistical infrastructure, ideally including a statistical business register. The main statistics for timely quarterly national accounts are:

- Monthly or quarterly index of industrial production
- Monthly or quarterly import and export statistics
- Monthly or quarterly producer price indices and a consumer price index.
- Monthly or quarterly data on government expenditure.

Given its relevance in most of the low- and middle-income countries, the allocation of the production of agriculture, forestry and fishing to quarters is also important. SNA rules require distribution of the output of growing of crops or timber over the growing period. In practice, however, the time

of harvest is often taken as the yardstick for allocating output to quarters (which then means that seasonal adjustment becomes important).

F.17.4.2.3. Price indices or volume data for compiling national accounts in constant prices

Knowledge about the changes of prices and volumes is needed for compiling the supply and the use of products in constant prices. The price data may come from Producer Price Indices and from specific elements of the Consumer Price Index (CPI). CPI elements are commonly used for deflating the output of service industries supplying services to the households.

Price indices may be calculated for output and for imports or exports, but also for inputs (intermediate consumption of goods). Input price indices can be used for the non-market government services where no relevant price or volume information exists for this kind of output.

Producer Price indices (PPI) are mainly based on questionnaires from surveys where the prices are defined as sales price at the factory gate (in SNA called "basic prices"). Usually, PPIs are compiled for specific kinds of activity. Countries usually have several PPIs but just one CPI. However, the CPI may have several sub-indices such as food, non-food, health, education etc.

Unit value indices: When the product specification is so detailed that the products can be regarded as homogeneous, unit value indices can be used. The underlying equation is

Value = volume x price.

When information on values as well as on volumes (quantities) are available, price can simply be calculated as unit value. This is typically the case for external trade statistics (imports and exports). In agriculture, forestry and fishing, and mining, the output is usually calculated by multiplying prices with quantities. As the products of these economic activities are raw materials or still close to them, hence rather "homogeneous", one may also speak of unit prices, often provided as time-series of absolute prices rather than in index form.

Input price indices: Where no price indices or volume indicators exist, e.g., in case of business services, input price indices can also be used as a proxy for the evolution of output prices. Input price indices for the different industries usually have a weighting scheme according to the respective intermediate consumption. For compensation of employees, wage rate indices would be the appropriate tool.

F.17.5. Analysing data quality and identifying problems

F.17.5.1. SPECIFIC QUALITY ISSUES FOR NATIONAL ACCOUNTS

The quality of National Accounts data depends on their scope ("milestones" achieved), their timeliness and reliability, the methodologies used, the quality and coverage of their data base, their compliance with international recommendations (especially the SNA), and their accessibility and transparency for the users.

The statistics the National Accounts are based on may have delays and statistical errors, or they may be incomplete. This may require estimates because comprehensiveness is a must for GDP calculation. Over time data sources may improve, enabling corrections of the National Accounts figures. Hence, these figures are maturing over time from preliminary over revised to final results for any reference year or a quarter.

Analysts usually want to compare National Accounts with those from neighbouring countries or with countries in a similar state of economic development. Despite the international rules, this is not straightforward because economies have different size, different environmental or economic conditions, and different currencies. Therefore, per capita averages of GDP or GNI are the norm. The same applies to the conversion of the results into a common currency where the results of the International Comparison Programme ("purchasing power parities") should be used.

To evaluate the National Accounts, IMF is conducting user assessments to prepare the IMF's Reports on Observance of Standards and Codes' (ROSCs). The IMF's reports are focusing on topics as prerequisites of quality, methodological soundness and accuracy and reliability.

F.17.5.2. THE "NON-OBSERVED" ECONOMY

F.17.5.2.1. Activities missing from statistical data collection

The economic activities missing from statistical data collections and from administrative sources have become known as the **"non-observed economy" (NOE)**. NOE refers to productive activities that may not be captured in the basic data sources used for compiling national accounts.

The following activities should be recorded within the production boundary in the national accounts:

- underground activities,
- informal activities, including production of households for their own final use,
- illegal activities although this is difficult in practice. Different ways of measuring illegal economy also reduce comparability between countries.

- other activities omitted due to deficiencies in the basic data collection program.

Production of households for their own final use is defined as those productive activities that result in goods or services consumed or capitalized by the households that produced them.

The following types of production by households are included within the production boundary whether intended for own final consumption or not:

- Production of goods for own final consumption, e.g., of agricultural products and their subsequent storage, gathering of berries or other uncultivated crops, forestry and the collection of firewood, hunting and fishing.
- According to 2008 SNA, other kinds of processing such as dressmaking and production of pottery and furniture should be included within the production boundary for countries where this is important.
- Own-account production of housing services by owner-occupiers;
- Own-account construction, including that by households;
- Production of services by paid domestic staff;

Domestic and personal services provided by members of a household for their own consumption are not included within the production boundary.

This means that activities like cooking, housecleaning, and looking after children and elderly people are excluded from GDP. These services are only included if they are carried out by people paid for doing so.

F.17.5.2.2. The informal sector and the non-observed economy

The informal sector definition was adopted by the Fifteenth International Conference of Labour Statisticians in January 1993 and was linked to the conceptual framework of the SNA.

The informal sector was considered a sub-sector of the SNA institutional sector 'households', but the expression "informal sector" used in the context of the International Labour Organization (ILO) work is used with a different meaning from the SNA grouping of institutional units. In the SNA, sectors are made up of complete institutional units. The ILO work focuses only on production activities and does not include the consumption and accumulation activities of the unit. Households having no productive activity are simply not included in the informal sector.

The non-observed economy (NOE) overlaps with but is not the same as the ILO concept of **the informal sector**. The **observed and non-observed informal sector** involves in many less developed countries an important labour force, which contributes to economic production. The main aim of compiling statistics should be to cover as far as possible the productive activities belonging to the SNA. Exhaustive coverage is an important quality aspect of National Accounts.

The informal sector may be broadly characterized as consisting of units engaged in the production of goods or services with the primary objective of generating employment and incomes for the persons concerned. These units typically operate at a low level of organization, with little or no division between labour and capital as factors of production and on a small scale. Labour relations - where they exist - are based mostly on casual employment, kinship or personal and social relations rather than contractual arrangements with formal guarantees.

The production units of **the informal sector** have the characteristic features of household enterprises. The fixed and other assets used do not belong to the production units as such but to their owners. The units as such cannot engage in transactions or enter into contracts with other units, nor incur liabilities on their own behalf. The owners have to raise the necessary finance at their own risk and are personally liable, without limit, for any debts or obligations incurred in the production process. Expenditure for production is often indistinguishable from household expenditure. Similarly, capital goods such as buildings or vehicles may be used indistinguishably for business and household purposes.

A restriction is that at least some of the production must be sold or bartered. Some of the household enterprises that the SNA treats as producing "for own final use" are excluded from the **informal sector if they** produce exclusively for own final use. The activity of dwelling services produced purely for owner-occupation is excluded from the Informal sector.

The informal economy is considered as comprising informal employment (without secure contracts, worker benefits, or social protection):

- Informal employment in informal enterprises (small unregistered or unincorporated enterprises), including: employers, employees, own-account operators, and unpaid family workers in informal enterprises;
- Informal employment outside informal enterprises (for formal enterprises, for households, or with no fixed employer), including: domestic workers, casual or day labourers, temporary or part-time workers industrial outworkers (including home-workers), and unregistered or undeclared workers.

A key reference on the measurement and estimation of the non-observed economy is the OECD's 'Measuring the Non-Observed Economy – A Handbook' from 2002, which focuses on the non-observed economy in a national accounts framework. The UNECE has been documenting national practices regarding the national accounts treatment of the non-observed economy, e.g. in the report 'Non-observed Economy in National Accounts – Survey of Country Practices (2008)'. Eurostat's 'Essential SNA: building the basics' is a practical handbook aiming to support the Least Developed Countries, micro-states and others in implementing the 2008 SNA; it contains a chapter specifically on the measurement and estimation of the non-observed economy and the informal sector in less developed countries in compliance with the 2008 SNA.

Box F.17.4: Eurostat's Handbook 'Essential SNA: Building the Basics'

As a follow-up to the Luxembourg Recommendations, Eurostat has developed the handbook 'Essential SNA: building the basics', to support countries that need to develop the basics of a National Accounts system. It has been revised twice and now it is available in its 2014 version. The main aim of this Handbook is to provide statistics producers with clear and simple guidelines for implementing the SNA.

Based on input from regional organisations and from high-level experts in National Accounts, the Handbook presents the following key issues for basic implementation of 2008 SNA:

Institutional issues: the necessity of creating a legal framework for National Accounts implementation and the strategy for developing the statistical system as base for National Accounts. This also includes dissemination issues;

Technical issues regarding the statistical infrastructure, such as the business register and the classifications which should be used;

Technical issues on statistical and administrative data sources required for National Accounts compilation, especially the use of data to compile National Accounts indicators;

Specific issues for National Accounts compilation, common to all target countries. These include, amongst others, the informal sector and the compilation of National Accounts in the conditions of high inflation.

The 2014 edition has been enhanced by special chapters on measuring quarterly GDP and on supply and use tables. The explanations on volume measures have been extended.

F.17.6. Improving the National Accounts

Besides the SNA itself, there are various guidelines which intend to help the countries in improving their National Accounts. This is especially true for all technical issues which may come up during compilation, provided that the national compilers are skilled and experienced enough to extract the solutions they are searching for. If this is not the case, several forms of technical assistance may be mobilized:

- support from international organizations the country is a member of, e.g., in case of African countries, support from a Regional Economic Community (REC) or from the African Union Commission / STATAFRIC,
- support from bilateral donors or from international organizations like the World Bank, the IMF, the European Union, the regional development banks (Inter-American Development Bank, African Development Bank Asian Development Bank), often organized through consultancy companies funded by them (see box F17.7),
- support from countries which were once in a similar situation, but which are already more advanced, often termed as "peer-to-peer" learning or as "south-south-cooperation".

Moreover, domestic stakeholders of the National Accounts may be involved in technical assistance, such as the Central Bank or ministries producing economic data for National Accounts compilation.

Turnover of qualified and trained staff is very serious problem for the National Accounts. The compilation of National Accounts requires special local knowledge about the structural set-up of the country's economy. Enabling their participation in special training courses in National Accounts compilation methodology or on the coverage and quality of the underlying economic statistics, possibly abroad, is another option for strengthening the technical competence of the compilation team.

Another source for strengthening capacities would be the participation of countries in international endeavours, such as the international price comparisons resulting in Purchasing Power Parities (PPP), or the preparation of the next revision of the SNA, now "SNA 2025". International organizations are encouraging all countries to do so.

National Accounts may also benefit from improvements or activities which are meant for official statistics in general rather than for National Accounts in particular. Furthermore, many less developed countries have a National Strategy for the Development of Statistics (NSDS). In Africa, some RECs have in parallel developed such strategies for their regions (see box F.17.9 about the RSDS of IGAD).

The scope and concepts of National Accounts must adapt to challenges accruing from new phenomena such as digitalisation or demands for implementing environmental aspects. Specialized international initiatives and working groups are dedicated to such topics. One of them is the 'Beyond GDP' developing indicators on well-being that are more inclusive of environmental and social aspects than the traditional GDP aggregates. Less developed countries may actively take part in such initiatives or may, at least, monitor new developments in macro-economic accounting.

Another challenge for National Accounts comes from globalisation. The growing cross-border interactions involve significant challenges for suppliers of macro-economic data, but the interpretation and application of statistics is also becoming more difficult.

In recent decades, there has been a deepening of globalization through, for example, global production arrangements. Increasingly, production processes extend over the whole world, and the relevance of legal national borders is fading. As a result, it is becoming more and more difficult to apply the standard definitions regarding internal (domestic or national) vs. external (foreign) economic activities. Therefore, the dividing line between resident and non-resident economic units – a major distinction for National Accounts – is also fading.

The features of economic globalisation which cause most measurement problems are:

- increasing share of international transactions between parents, subsidiaries, and affiliates;
- flows of intellectual property and related income;
- new treatment of goods for processing and merchanting;

- dealing with factoryless goods producers.

All of these increasingly common aspects of economic globalisation make the capture and accurate measurement of cross-border flows a growing challenge for national statisticians. For instance, for these reasons the EU Member States identified globalisation as the highest priority in the research agenda of the future edition of the System of National Accounts and the European System of Accounts.

As National Accounts are a complex framework of equations, similar in its procedures to commercial bookkeeping, the question always comes up for software solutions. Unfortunately, the list of specialized software is limited, often reduced to preparatory data handling like benchmarking (see box F.17.7). One exception which has a holistic approach is the ERETES software described in box F.17.5.

Box F.17.5: ERETES national accounts software

Despite of all achievements of harmonizing National Accounts, the software solutions for its compilation are few. Many countries still rely on spreadsheet related software like EXCEL, including some tools as "add-in" to EXCEL which cover certain specific topics of National Accounts such as XLPBM, developed by the IMF for benchmarking of time-series with different periodicities. Some general statistical package tools are also in use, e.g., for seasonal adjustment. Nevertheless, there are tools which had been developed especially for the compilation of National Accounts at large. In Africa, the most common one is ERETES, mainly used in (but not necessarily confined to) the francophone countries in West-Africa.

Eurostat is engaged in the transfer of knowledge to the community of users. In line with the Luxembourg Recommendations suggesting using a common tool for the production of National Accounts, it continues its support to ERETES. ERETES provides assistance in compiling accounts which comply with the international standards of SNA 2008 and result in the two main synthesis components of the SNA 2008: the Supply and Use Table and the Integrated Economic Accounts, including financial accounts but excluding balance sheet accounts. ERETES serves as a place for storing data and working tools, as a tool for organizing teamwork and as an itinerary to transform the "inputs" (incoming data) into outputs (results produced). It includes

- An assistance process with the organization of the work of the team of accountants,
- A database in which the user downloads the data provided by his statistical system,
- Worktables to analyse these data and to make them compatible, in an iterative process crossing different points of view: goods and services, distributive transactions, financial transactions, institutional sectors.

ERETES operates from a database with different technical tools (product flows, branch accounts, matrices from whom to whom) and organizational tools (follow-up of work, note pad, online help). It allows coordinated and consistent teamwork. It reconciles the data and allows calculation of GDP according to the 3 traditional approaches (production, expenditures, income).

ERETES is co-owned by Eurostat, INSEE and the users' community represented in a steering committee. Currently, about 30 countries over the world are using ERETES including around 25 African countries. The African countries are: Morocco, Mauretania, Tunisia, Algeria, Niger, Chad, Senegal, Guinea, Guinea-Bissao, Capo Verde, Mali, Burkina Faso, Ivory Coast, Togo, Benin, Central African Republic, Democratic Republic of the Congo, Republic of the Congo, Gabon, Cameroon, Comoros.

ERETES can be visited on its own website. It is available in French, English, Spanish, and now also in Portuguese and in Arabic. In the EU-funded Pan African Statistics Programme (PAS) and its economic statistics grant dimension, INSEE has been mandated to update ERETES and to improve its functionalities. INSEE will work on the balance sheets and some modules that are not available. The updated version of ERETES will be ready in three years.

Box F.17.6: Implementation of ERETES national accounts software

The duration and type of assistance required for implementation of ERETES largely depend on the future users' level of experience of national accounts. Practical experience indicates that, to provide assistance, several missions by an expert national accountant with specialist knowledge of the ERETES software are required. These missions coincide with the seven phases of compiling accounts using ERETES:

Phase 1 : Identification

- A country wants to adopt the ERETES software for compiling its national accounts. ERETES meets its requirements.
- The identification mission must analyse the local equipment, IT and statistical environment in the light of ERETES' requirements and propose the necessary updates. An in-depth presentation of the software will help the users to participate in this analysis.
- Where appropriate, the base year will be chosen, and a timetable will be drawn up for the first accounting year.
- An analysis of the IT situation will list any requirements in terms of equipment, software and basic computer training.
- An analysis of the statistical situation will involve a first overview over the available data and will identify any measures that may be necessary to supplement the incoming data.
- A detailed presentation focuses mainly on the handling of the tool by future users. It provides a complete view of all the work to be done, so that the full scope of it can be appreciated, and an informed decision taken on whether to install ERETES.
- If the decision to install ERETES is confirmed, the installation timetable will be fixed. On average, two years are needed to compile a base year plus a current year. At the end of these two years, the team will have fully mastered working with ERETES.
- This identification mission is scheduled to last ten days in the country concerned.

Phase 2 : Installation

- The equipment and the necessary software are available, the team possesses the necessary IT skills. The work classifications have been drawn up and the main sources of data have been identified.
- The objectives of this mission are:

to install the software in all the planned workstations,

  - to load the local work classifications
  - to initialise the first accounting year
- The database management system and the ERETES software will be installed and customised on all the envisaged workstations.
- The local IT correspondent is appointed; (s)he will participate in the installation of the software, in order to be able to repeat the procedure on their own. Training in the IT aspects of ERETES will be provided to the entire team and to any interested IT technician.
- The local classifications prepared by the National Accountants will be verified and loaded in the database.
- The procedure for launching the first accounting year will be completed.
- The preparation of sources is a delicate task, which is the sole subject of the subsequent mission. This mission will clarify the role of each attribute and the importance of the work on sources, so that the team can begin to assemble its sources.
- This mission will be undertaken jointly by an ERETES computer specialist to deal with all IT aspects and a national accountant specialised in ERETES

Phase 3: Processing of sources

- The national accountants have collected all required sources to compile the accounts.
- Users are trained to prepare the files that allow them to load their sources into ERETES. At the end of this mission, they must be capable of undertaking this task on their own. Specific exercises from the test set permit users to become familiar with the problems encountered when processing sources; choice of attributes, organisation of data, changeover from business accounts to national accounts.
- The entire team will participate in the study of prepared sources, organisation and aggregation of data. They will identify gaps in the information system and possibilities for remedying these. Then, each of the sources will be reviewed in order to decide:
  - the correspondence tables which should be used with the national accounts' classifications
  - the pillars around which these basic data should be concentrated
  - the most sensitive cases in terms of the allocation of methodological attributes.
  - It is usually during this mission that the table of production modes is finalised.
- During this mission, the users will have several opportunities to test the IT procedure for loading data into the database.

Phase 4: Pre-reconciliation

- The available source data have been processed and loaded in the database. An initial expert assessment of the overall consistency of these data must be made by the national accountants.
- This mission outlines the target objectives for each group of data and indicates the methods used in each case: external trade, final consumption, intermediate consumption, employment, gross fixed capital formation, output, taxes, trade and transport margins, salaries, inventories.
- In-depth training: Specific exercises of the test set permit users to become familiar with the techniques used in pre-reconciliations, in particular how to construct pivot tables and use them to analyse data.
- Various main problems need to be resolved: confrontation of mismatching sources; corrections of the valuation method or of the time of recording; verification of the apparent rates of tax or social contributions; employment balance by industry and method of production (for assessment of the informal economy – see section F.21.4.2).

Phase 5: Work on local posts

- The data loaded in the base have been pre-reconciled, and are sufficiently consistent so that one can pass to the stage of decentralization.
- This mission outlines the iterative cycle "Decentralisation, work on local posts, repatriation, transversal work" and trains users to work on the tables used in the decentralisation phase.
- Decentralisation will be carried out by one of the administrators of the base, under the supervision of the external national accounts expert.
- Presentation of the different work tables on local posts proposed: supply/use balances, industry accounts, "who to whom" matrices (balance distributive transactions and financial transactions). Exercises from the test set and practical exercises based on local data will help users to become familiar with the various tools available.
- Repatriation will be undertaken by one of the administrators of the base, under the supervision of the external national accounts expert.
- A brief presentation of the transversal work procedure.

Phase 6: Synthesis

- Several successive iterations of the cycle "Decentralisation, work on local posts, repatriation, transversal work" have been carried out. The main inconsistencies initially presented by the data have been eliminated. In particular, the global supply of Intermediate Consumption derived from supply/use balances has been reconciled with the global demand expressed by the industry accounts.
- This mission must permit users to finish compiling the accounts of their base year. First the use matrix will be completed, followed by the principal synthesis tables: the Supply / Use table and the table of Integrated Economic Accounts.
- Synthesis of the Inter-Industry Trade Table: From the outset, only the margins of the table are in balance: the core of the Intermediate Consumption matrix needs to be supplemented.
- Finalisation of the synthesis tables.
- The Table of Integrated Economic Accounts may be used for publication straight away.
- A detailed timetable for compiling the accounts of the next accounting year is prepared.

Phase 7: Work on current year

- The base year accounts have been finished, ready for publication. This base and its entire documentation have been archived. The team has collected the sources for year n + 1 and is starting to process them.
- Train users in the specific characteristics of work on a current year.
- Review each of the work phases to identify their specific characteristics in a current year:
  - loading of sources: how to load value, volume, or price indices
  - pre-reconciliation: how to pre-reconcile prices
  - decentralised phase: the specific price and volume work tables
  - synthesis: projection of intermediate consumption

Box F.17.7: JDemetra+ and JEcotrim software for temporal breakdown of time series

For short-term economic analysis, the National Accounts usually foresee compilations in quarterly time-series of GDP and related aggregates. Since harsh distortions of business cycles by the COVID-19 pandemic in 2019 and 2020, low- and middle-income countries showed growing interest in providing short-term indicators and in using appropriate software tools for applying statistical methods for temporal disaggregation of the annual accounts data, in accordance with mathematical and statistical methods which use reference indicators that permit extrapolation for the current year. These methods may also be used to produce 'flash estimates', i.e. estimates for the present time, by using the available information in the best possible way, including, in the framework of a statistical model, the short-term available information and the low frequency data in a coherent way.

Temporal disaggregation techniques are useful also in compiling short-term statistics. Monthly indicators of GDP can be derived from the available information respecting the coherence with quarterly data. Temporal disaggregation can also be used to compile a range of other short-term statistics, such as short-term industrial statistics, employment statistics and money and banking statistics

For many years, Eurostat has developed software tools for temporal breakdown of time series (short term statistics, quarterly national accounts) and offers them for free. There are two which have been widely used by the specialists in the countries, including less developed ones. The older tool is ECOTRIM which supplies a set of mathematical and statistical techniques to carry out 'temporal disaggregation'. It runs under Microsoft Windows, either in interactive mode, with the user directly involved in the analysis, or in batch mode. ECOTRIM and its updated version called JEcotrim were in common use for many years. Since 2016, JEcotrim is not any more delivered as a stand-alone product but as a set of plugins which can be installed directly in JDemetra+, meanwhile the favourite tool for seasonal adjustment. This eases usage of both tools as user needs only to have one application to run. Also, JEcotrim can for example use additional data providers developed for newer version of JDemetra+.

JDemetra+ is developed by Eurostat in collaboration with the National Bank of Belgium (NBB) and the Deutsche Bundesbank in accordance with the Guidelines of the European Statistical System (ESS). Since 2015, it has been officially recommended to the members of the ESS and the European System of Central Banks as software for seasonal and calendar adjustment of official statistics. Meanwhile, many other countries are also using this free and open-source software.

JDemetra+ implements the concepts and algorithms used in TRAMO/SEATS and X-12ARIMA (now X-13ARIMA which are the two leading methods in seasonal adjustment. Those methods have been re-engineered using an object-oriented approach that enables easier handling, extensions, and modifications. Besides seasonal adjustment, JDemetra+ bundles other time series models that are useful in the production or analysis of economic statistics, including for instance outlier detection, nowcasting, temporal disaggregation or benchmarking.

From a technical point of view, JDemetra+ is a collection of reusable and extensible Java components, which can be easily accessed through a rich graphical interface.

Box F.17.8: Technical assistance in National Accounts: support to South-Sudan

South Sudan became an independent state in July 2011. With extensive support from donors and as part of its National Strategy for the Development of Statistics, the National Bureau of Statistics (NBS) of South Sudan developed a method for GDP calculation which used an expenditure approach, mainly based on household surveys and with 2009 as benchmark year. Exports and imports data have been taken from the balance of payments produced by the central bank. Given the scarcity of source data for the production side of GDP, the NBS made extensive use of estimates and fixed ratios. In addition, in absence of other relevant price indices, the constant price estimates were almost fully based on CPI data.

In 2013, the NBS published GDP by expenditure for the years 2008 to 2012 at current prices and, for the first time, at constant prices in October 2013. A Swedish expert developed a SUT for 2010.

Since reference year 2017, the GDP calculation from the expenditure side is the only approach. Due to lack of reliable data, the GDP calculation from the production side has stopped after releasing 2016 because especially in 2015 and 2016, the figures of the two approaches to GDP had evidenced a very large and widening gap between them.

At that stage, the Pan-African Statistics project, funded by the European Union, came on board with several short-term missions to support South-Sudan's National Accounts compilation team (at that time five persons), also giving advice also on the design of the economic statistics and on plans for a statistical business register. In view of implementation of international standards, South Sudan had partly adopted ISIC Rev. 4, COFOG 2014 for government consumption and COICOP 1999 for households.

In 2019 and for the reference year 2018, the NBS conducted an Integrated Business Establishment Survey (IBES) by economic activity (private non-agricultural), allowing the new country to have an evidence-based picture of the structure of its economy which goes beyond the production of oil. The list frame for the survey captured roughly 13,000 establishments, the sample being roughly 5,000 out of them. The idea was to develop a SUT for 2015, as a starting point for extrapolations from there. But the results evidenced gaps in data collection and misclassifications. Since then, the support was focused on making use of the IBES as far as possible.

The direct support through missions was delivered until early 2019. Since then, due to constraints from the COVID-19 pandemic. the support was given on remote basis, mainly through online conferences, but including South-Sudan as only one of the numerous participants.

Box F.17.9: Technical assistance to the Inter-Governmental Authority on Development (IGAD) for developing its RSDS

During the last twenty years, numerous countries have developed so-called National Strategies for the Development of Statistics (NSDS), in most cases in cooperation with 'Partnership in Statistics for Development in the 21st Century' (PARIS21). PARIS21 was established in 1999 by the United Nations, the European Commission, the Organisation for Economic Co-operation and Development (OECD), the International Monetary Fund, and the World Bank. It guides and support countries in strategic planning of their statistical endeavours, emphasizing the overarching need for a systematic multi-annual plan, adjusted to the resource potential but, most of all, oriented to the demand for data. It goes without saying that the needs of National Accounts play an important role in such national strategies.

In cooperation with the EU-funded Pan-African Statistics project, regional trainings on strategic planning of statistics were held in 2021, at a time when the COVID-19 pandemic already had given reason to review plans for further censuses and surveys. One of the results of these meetings was an initiative from the Inter-Governmental Authority on Development (IGAD), a regional economic community (REC) which is comprised of eight African countries around the Horn of Africa. Recognising its needs of statistical information for the development of the region, the IGAD Secretariat sought the AUC's assistance under the EU-funded Pan- African Statistics Programme to develop a Regional Strategy for the Development of Statistics. This plan has been developed and published (https://igad.int/download/regional-strategy-for-the-development-of-statistics-2021-2025/). IGAD is one of the first two RECs to have such a strategic plan. The other one is COMESA, the Common Market for Eastern and Southern Africa.

The process of formulating the RSDS was guided by a participatory approach through extensive consultations of IGAD Secretariat and its affiliates, IGAD Member States, Pan- African Institutions, and development partners. One of its elements is the creation of Technical Work Groups. One of them has been established for National Accounts and held its first meeting in June 2022. The Technical Working Group on NA shall

- Produce reports on the compilation of national accounts at national and regional levels;
- Develop guidelines for the harmonization of national accounts at regional level;
- Support national level technical working groups on national accounts;
- Develop mechanism for a continuous process of adjusting the National Accounts of the IGAD countries to updates of international concepts and methods, having a special focus on the needs of planners and decision makers in the IGAD region.

Box F.17.20: ECOBUSAF

The ECOBUSAF project aims primarily at further developing statistical capacities in the area of national accounts (NA) in a limited number of African NSOs. The project covers the complete statistical process, starting from data collection, analysis, management, to dissemination, as well as IT tools supporting these processes. The project furthermore aims at enhancing harmonisation and reinforcing the development of statistical business registers (SBR) in a limited number of African NSOs.

The main activities in NA include supporting the implementation of SNA 2008, enlarging the scope of national accounts produced, supporting the development and the implementation of IT tools, the use of non-traditional data sources, experimentation (SNA 2025), training and workshops.

In business statistics, the activities include technical support and e-training on SBR and business demography statistics as well as the development and implementation of IT tools (including STATBUS, a generic statistical business register).

To find out more…

References and websites

- Intersecretariat Working Group on National Accounts (ISWGNA)
- Integrated Economic Statistics
- Partnership in Statistics for Development in the 21st Century (PARIS21)
- System of National Accounts 2008 - 2008 SNA

About National Accounts in developing countries

- Eurostat: 'Essential SNA: building the basics' Handbook
- Luxembourg Recommendations on Global Implementation and Outreach for the System of National Accounts (2008) – page archived by third-party service
- Intersecretariat Working Group on National Accounts (ISWGNA): 'Implementation Programme for the System of National Accounts 2008 and Supporting Statistics', 'Guidelines for monitoring the 2008 SNA implementation' and the SNA Implementation website
- African Group on National Accounts (AGNA): 'Draft African Strategy for the Implementation of the 2008 SNA' (2010)
- United Nations Economic and Social Commission for Asia and the Pacific (ESCAP): 'Proposed regional programme for the improvement of economic statistics in Asia and the Pacific' (2010)
- United Nations Economic Commission for Africa: Reforming national accounts systems in Africa (2009); Implementation guide for the 2008 System of National Accounts (2008 SNA) in Africa (2010); Handbook on Supply and Use Table: Compilation, application, and practices relevant to Africa (2012)
- African Union: Manual on basics for the compilation of GDP for countries in Africa (2021), through Pan-African Statistics project funded by the European Union

System of National Accounts and European System of Accounts

- System of National Accounts, 1993 (1993 SNA)
- System of National Accounts, 2008 (2008 SNA)
- European System of Accounts, 1995 (ESA1995)
- European System of Accounts, 2010 (ESA2010)
- Eurostat Manual of Supply, Use and Input-Output tables

Methodology – Non-Observed Economy

- OECD: Measuring the Non-Observed Economy – A Handbook (2002)
- UNECE: Non-observed Economy in National Accounts – Survey of Country Practices (2003)
- UNECE: Non-observed Economy in National Accounts – Survey of Country Practices (2008)

Methodology – Balance of Payments

- IMF Balance of Payments manual, 5th edition (BPM5) (1993)
- IMF Balance of Payments and International Investment Position Manual, 6th edition (BPM6) (2009)

Software

- ERETES software package for National Accounts
- EUROTRACE software package to manage data for imports and exports of goods
- JDemetra+ software package for seasonal adjustment; it includes a plug-in for temporal disaggregation and benchmarking that has replaced ECOTRIM

Data sources

- United Nations: National Accounts Main Aggregated Database
- World Bank: Economic Policy and External Debt
- OECD: Data
- World Bank: World Development Indicators
- Eurostat: National Accounts statistics
- Statistical Commission for Africa (STATCOM-Africa)
- African Union Commission / STATAFRIC

F.18 Government finance and public sector statistics

F.18. Government finance and public sector statistics

The chapter in brief

This chapter covers statistics on the finances of government and public sector, informing fiscal policy both at national and subnational level. The different principles of government budgeting and accounting are explained. The difference between government finance statistics and public financial management is also clarified. Relations between government financial statistics and the government sector in the national accounts are also discussed.

Budget compilation methodology at both national and sub-national (regional, local) levels varies between countries. Data taken from national budgets may therefore not be directly comparable internationally. Budget methods may also be modified over time, so that unmodified time series data for the same country may also not be directly usable for understanding fiscal processes or macroeconomic analysis.

Practical advice is given on government finance statistics in partner countries, emphasising comparability over time and between countries.

F.18.1. Policy applications: what these statistics are used for

There are important reasons for the increasing interest in government finance and public sector statistics:

- Governments redistribute a large part of the national income through the budget, so it is important to know for which policy purposes/fields the money is spent.
- The level and the composition of the tax burden is a key area for policy making and analysis.
- Governments are usually good debtors; they are able to absorb liquid financial assets, crowding out private investors.
- Excessive public debt and the liabilities of unfunded social security pensions are an implicit burden for the next generation.
- Well run government finances limit the cost of debt to the country. This requires limiting government deficits and the level and composition of debt to within appropriate ranges.
- The availability and quality of current government finance and public sector statistics are vital for budget support measures, as they provide the baseline and current data for calculating key indicators to monitor and evaluate the impact of the measures.
- In many countries, especially partner countries, government debt is mainly financed by foreign investors. The level of government deficit and debt may therefore influence the country's external financial position.
- Government finance statistics are used to analyse the level and structure of tax and other revenues. They inform domestic revenue mobilisation initiatives that aim for tax systems that are simple, broad-based, efficient and fair. Because fiscal policy plays a central role in promoting development, the methodology of fiscal management in partner countries is regularly scrutinised by international organisations. Various diagnostic and assessment methodologies for Public Financial Management (PFM) are specifically designed for partner countries. Section F.18.5 deals with PFM in more detail.
- The national accounts government sector provides information on its output and use of resources. It demonstrates the economic role of government.

F.18.2. Concepts and definitions

F.18.2.1. ACCOUNTING PRINCIPLES: CASH BASIS VERSUS ACCRUAL BASIS

There are two different accounting principles used in budgets: cash basis accounting and accrual basis accounting. National budgets were traditionally compiled on a cash basis and this is still generally the case in most partner countries. Many developed countries have now moved to an accrual basis.

Cash basis

The cash basis of accounting recognises transactions and events only when cash is received or paid by the 'budget unit,' defined as a government or public sector department or organisation which is responsible for a defined budget. For example, under the cash basis the payment of current income tax is recorded when the payment is actually made, usually some months after the end of the reference year. A budget based on a cash basis only records monetary flows. Financial statements prepared under the cash basis provide information on the sources of cash raised during the period, the purposes for which cash was used, and the cash balances at the reporting date.

The financial statements focus on measuring cash balances and the changes in them. Notes to these financial statements may provide additional information about liabilities and some non-cash assets. Using the cash basis, payments against government debt are recorded when interest or principal repayments are actually paid.

Under cash basis accounting, the focus is on capturing current transactions. Debt is only captured for debt service and 'drawing' (e.g., raising cash by taking up debt, issuing government bonds etc.). In order to assess a country's ability to handle further borrowing, additional records are needed to keep track of the nominal value of the country's liabilities, its debt stock. Debt management and reporting is a critical issue in many partner countries.

The International Public Sector Accounting Standard (IPSAS), Financial Reporting under the Cash Basis of Accounting details public sector financial reporting standards using the cash basis of accounting.

Accrual basis

Under the accrual basis of accounting, transactions and events are recorded when amounts to be paid are incurred. For example, the payment of current income tax is recorded within the reference year, during the same times period as when the income is earned. Interest payments on the government's debts are recorded for the time period when the amounts are due, not necessarily in the same time period when paid. Accrual accounting also covers non-monetary transactions, such as distribution of goods or assets free of charge, and the assumption or cancellation of debt.

Accrual accounting is often considered the best basis for analysing enterprises, measuring cost, income, and net worth. However, maintaining cash accounts is useful for purposes such as liquidity management. It is possible to adjust from cash based to accrual based financial statements.

Although the main guidelines for government finance (see section F.18.2.2. below) apply accrual accounting, even some developed countries still use cash basis accounting in their national budgets. However, countries are increasingly moving towards accrual accounting based on international accounting standards and recommendations. A change to accrual accounting should be a part of an overall reform and not an end in itself; and each step should be a useful one.

Box F.18.1 International guidelines on government finance

Two main internationally accepted government finance guidelines exist. One is the Government Finance Statistics Manual (GFSM), prepared by the IMF. The second methodology is the UN's System of National Accounts (SNA), together with its supplementary detailed regulations for accounting for government sectors. The European System of Accounts (ESA), attuned to the specific needs of the EU and managed by Eurostat, is closely based on the SNA. . The presentation of GFSM and SNA/ESA is substantially different. The balancing items are either identical or can easily be derived from each other.

In the European Union, government finance statistics are compiled according to European System of Accounts (ESA) standards. Their presentation is fully consistent with the national accounts, allowing for a consistent macro-economic and fiscal analysis, including for forecasting purposes. The key balancing item, net lending / net borrowing, can both be calculated from the ESA definition of total revenue minus total expenditure of the general government sector and the balancing item of the capital accounts according to ESA/SNA. The compilation and detail of European government finance statistics is considered very advanced, as key aggregates (net lending / net borrowing and gross debt) are carefully verified in line with the provisions of the EU Stability and Growth Pact.

Example of differences between GFSM and SNA. The GFSM does not record separately the value of financial services paid as part of the 'interest margin', i.e., the difference between the bank interest rate charged for loans and the interest rate paid on deposits. This item is called FISIM: Financial Intermediation Services Indirectly Measured. It is needed in the national accounts in order to reflect the output and value added of financial corporations

F.18.2.2 GUIDELINES FOR GOVERNMENT FINANCE STATISTICS

Government has special powers, motivations and functions with respect to the economy. This special position is reflected in the statistical methodology of government finance. Government activities often have a great influence on the economy. In order that public finance statistics provide an accurate and coherent observation of this impact, its methodology needs to be consistent with the rules of national accounting.

The International Public Sector Accounting Standards Board (IPSASB) publishes International Public Sector Accounting Standards (IPSAS) both for cash basis accounting and accrual accounting in the public sector. All IPSASs are contained in the IFAC Handbook of International Public Sector Accounting Pronouncements.

The IMF, the European Union and the IPSASB work to seek consistency and reduce differences. However, it is inevitable that some differences may remain because the purposes of the statistics may be distinct.

F.18.2.3. THE COVERAGE OF THE GOVERNMENT SECTOR AND OF THE PUBLIC SECTOR

Government finance statistics use both economic and legal criteria to define the greater government sector. This means that the coverage of the greater government sector in government finance statistics does not necessarily coincide with the coverage of the official budget. The statistical definition of the main elements of the general government sector is (GFSM paragraph 2.58):

- The general government sector consists of resident institutional units that fulfil the functions of government as their primary activity, in addition to fulfilling their political responsibilities and their role of economic regulator. The general government sector comprises
    - All government units of central, state, provincial, regional, and local government, and social security funds imposed and controlled by those units
    - All nonmarket, non-profit institutions that are controlled by government units.

The European System of Accounts (paragraph 20.05) defines the general government sector as consisting of all government units and all non-market nonprofit institutions (NPIs) that are controlled by government units. It also comprises certain other nonmarket producers.

The structure of subnational governments depends on the administrative and legal arrangements in each country. In public finance statistics, a maximum of three levels of government is defined: central government, state/regional government, and local government. Together, these are considered 'general government'. Social security funds may be treated as a distinct subsector, as is the case for European Union Member States.

If non-market institutions controlled by government are not fully consolidated within a government budget, then they are classed as extra-budgetary entities within general

government. Universities, for example, might be classified in this way.

In some countries the budget only covers a general fund, without institutional coverage. In such a case, only taxes, social contributions and dividends (if applicable) are recorded on the revenue side. Expenditures are classified as transfers, grants between levels of government and interest payments. In this case, wages and salaries of government employees are not recorded separately but included in the total amount of transfers.

In order to compile public sector finance statistics as a whole, data are required for institutions included in the central government budget; for sub-national state, provincial, regional, and local government budgets; for social security funds (if separate); for extra-budgetary units of general government (using business accounting standards); and for the public sector that is not part of government.

The unit types that should be included in the statistics for **General government** are those that are funded from:

- Central government budget
- Sub-national budgets
- Social security funds
- Extra-budgetary entities.

Public corporations are resident corporations that are controlled by government or by other public corporations (GFSM paragraph 2.104) that provide all or most of their output to others at economically significant prices (GFSM paragraph 2.65). Control of a corporation is defined as the ability to determine general corporate policy of the corporation, a notion that goes beyond ownership. GFSM 2014 (Box 2.2) defines 8 indicators of government control of corporations that should be assessed.

Public corporations are classified as nonfinancial or financial corporations, depending on the nature of their primary activity:

- Public non-financial corporations, whose principal activity is the production of market goods or nonfinancial services
- Public financial corporations, including the Central Bank, which are principally engaged in providing financial services, including insurance and pension fund services, to other institutional units

The public sector consists of both the general government sector and public corporations.

F.18.2.4. THE ANALYTIC FRAMEWORK

Public sector accounts, as with any other accounts, comprise a balance sheet and flow accounts. The balance sheet provides a record of assets and liabilities at the beginning and end of the financial reporting period. These are known as stock positions. The flow accounts record transactions: revenues and expenses, transactions in the financial accounts such as decreases in deposits and acquisition of loans, as well as changes in the stock of assets and liabilities over the reporting period. As the flow accounts represent the changes in the balance sheet over the reporting period, they are the equivalent of profit and loss in company accounts.

Government finance statistics should present government operations in the same way as they are presented in the budget. Government revenues are defined as:

- ***Revenue:*** consists of all transactions that increase the net worth of the government sector.
- ***Expense:*** consists of all transactions that decrease the net worth of the government sector.

Revenue

The main types of government revenue are taxes; social contributions that are made by employers and employees; dividends from public companies; rents (in resource rich countries); and grants from abroad.

Taxes and social security contributions are defined as compulsory transfers to government, without direct service in return. In fiscal analysis, the sum of tax revenue plus net social security contributions as a percentage of GDP is identified as the ***fiscal burden***.

In SNA and GFSM, the classification of taxes is different. The SNA has provisions for compilation of:

- taxes on production and imports
- current taxes on income, wealth etc.
- capital taxes

The GFSM classifies taxes according to the base on which the tax is levied. Six major groups are defined (paragraph 5.25):

- taxes on income, profits and capital gains
- taxes on payroll and workforce
- taxes on property
- taxes on goods and services
- taxes on international transactions
- other taxes

Governments also have revenue from social contributions; grants; and other revenue, including property income, such as interest (GFSM Table 5.1). Public sector corporations have income from the sale of goods and services, in the same way as private corporations.

Expenses and Expenditure

Expense is the decrease in net worth resulting from a transaction.

The general government sector has two broad economic responsibilities: (i) to assume responsibility for the provision of selected goods and services to the community, primarily on a nonmarket basis; and (ii) to redistribute income and wealth by means of transfers (see paragraph GFSM 6.1).

These responsibilities of the general government are generally fulfilled through expense transactions, which can be classified following an economic classification and/or a functional classification.

Expenditure is the sum of expense and the net investment in non-financial assets. It is presented as an additional aggregate in the Statement of Operations.

Expenditure is presented using economic and functional classifications to support different analyses..

The economic presentation identifies the types of expenditure incurred according to the economic process involved. It identifies final expenditure on goods and services, and intermediate expenditure on transfers through social benefits, grants and subsidies.

GFSM Table 6.1 presents the Economic Classification of (government) Expense:

- Compensation of employees
- (Final) Use of goods and services
- Consumption of fixed capital
- Interest (paid to residents and non-residents)
- Subsidies
- Grants;
- Social benefits paid to households
- Other expenses

A national application of this expenditure classification, incorporating extra-COFOG categories concerning capital transactions, is illustrated in Box F.18.2.

Box F.18.2 Namibia Estimate of Expenditure by Division

Actual expenditure for 2020-21 in Namibian Dollars		
10	Personnel Expenditure	29 591 755 598
30-40	Goods and other services	9 041 198 329
80	Subsidies and other current transfers	19 073 580 999
90	Interest and borrowing related charges	7 291 267 917
110-120	Acquisition of capital assets	4 979 167 699
130-150	Capital Transfers	1 411 891 483
220	Statutory (guarantees)	646 253 009
Grand total		**72 035 115 035**

Source: Republic of Namibia, Estimates of Revenue, Income & Expenditure 2022/23 – 2024/25 Table 7: Estimate of Expenditure by Sub-Division (Including Interest Payments)

The ***functional presentation*** identifies the social or economic purpose of the expense/expenditure through the Classification of the Functions of Government (COFOG). At the top level of COFOG, 10 divisions are distinguished:

- General public services
- Defence
- Public order and safety
- Economic affairs
- Environmental protection
- Housing and community affairs
- Health
- Recreation, culture and religion
- Education
- Social protection

COFOG is also used for making international comparisons of the involvement of government in different social or economic functions. COFOG functional groups at lower level are defined so that they represent either individual or collective consumption but not both. COFOG can therefore be used to distinguish those goods and services provided by general government units that are consumed individually from those that are intended to benefit the community collectively. (See GFSM paragraph 6.133).

Box F.18.3 Social benefits

Social benefits based on specified social needs are provided as social insurance or as social assistance. Social security benefits reflect membership of a collective social insurance scheme, including retirement and survivors' pensions. Social assistance benefits are provided by government in the absence of social insurance coverage. The third type of social benefit is employment-related, largely for government and public-sector employees. Note that the treatment of social benefits is different in GFSM and SNA (GFSM paragraphs 6.96-6.102).

The contributions to and benefits from the social security system are categorised into a) pensions and b) all other forms of insurance.

Social security pensions are in many countries partially or fully unfunded: the contributions received in a period are used to fund the benefits paid in the same period. The accounts for current receipts and payments for social security therefore do not fully reflect the system's pension liabilities, especially for future accounting periods. Social security pension system assets and liabilities are therefore the subject of specific treatment in government accounts. See the System of National Accounts 2008, Chapter 17, sections G-J1.

Government debt and deficit

The government balance sheet shows its total assets and liabilities at the end of an accounting period, disaggregated by type and by counterparty. Government debt represents those financial liabilities for which it is required to provide payment to the creditor, such as treasury bills and bonds (SNA 2008 Chapter 3). Debt is valued at market prices or their best estimates.

Debt is shown on the government balance sheet as a gross value. Domestic debt, defined as debt held by residents, should be distinguished from foreign/external debt, held

by non-resident counterparties. Debt is also classified by the currency in which it was issued. Similarly, debt is classified according to its maturity: a high share of short-term debt may cause difficulties in liquidity management.

Consolidated figures (see Box F.18.4 below) are usually reported: assets and liabilities where the debtor or creditor is another government (or public sector) unit, in particular treasury bills and bonds, are consolidated and interest payments netted out.

Box F.18.4 Consolidation

Consolidation nets out certain flows and stocks between units that belong to the same sector. The GFSM prefers full consolidation, at the expense of the consistency of the fiscal analysis framework with the macroeconomic framework.

Consolidation usually involves the elimination of stocks and flows in debtor-creditor relationship. For example, central government securities, such as treasury bills and bonds, owned by local governments are not included in the consolidated general government debt. Current and capital transfers paid between subsectors of government may also be netted out. For analytical purposes, consolidated figures for the government are more relevant: they present the relation of the government as a whole to the national economy. Consolidated figures for revenue and expense are, by definition, lower than unconsolidated figures.

Whereas debt is a stock value on the balance sheet, the deficit is a value in the flow accounts. Deficits contribute to an increase in debt levels, while surpluses reduce them. The change in government debt also reflects other elements.

The change in government debt not explained by the government deficit/surplus is called stock-flow adjustment. A positive stock-flow adjustment means that the government debt has increased more (or decreased less) than the value of the government deficit (or surplus).

The net debt and net deficit values as percentages of GDP are core indicators in monitoring the sustainability of government and public sector finance.

Balancing items

A balancing item is an accounting construct: the difference between the total value of the entries on one side of an account (resources or changes in liabilities) from the total value of the entries on the other side (uses or changes in assets). It is always a derived entry.

Four core balancing items can be used as measures for fiscal policy (GFSM Table 4A.1):

- ***Net operating balance*** equals total revenue minus total expense. The net operating balance is also equal to changes in the government sector's net worth due to transactions.
- The ***gross operating balance*** is revenue minus expense but excludes consumption of fixed capital from expense. Consumption of fixed capital is the decrease, during the reporting period, in the current value of the stock of fixed assets owned and used by a government unit. The decrease in value occurs as a result of physical deterioration, normal obsolescence or normal accidental damage. This concept is difficult to measure.
- ***Net lending / net borrowing*** equals the net operating balance minus net investment in non-financial assets. It also equals total financing: net acquisition of all financial assets minus net incurrence of all liabilities from transactions.
- ***Primary balance*** equals net lending/borrowing excluding the impact of interest expense and interest revenue.

The GFSM defines **expense** as a decrease in net worth resulting from transactions, and **expenditure** as the sum of expense and the net acquisition of non-financial assets. SNA defines net lending / borrowing as the difference in net worth due to saving and capital transfers and net acquisitions of non-financial assets (less consumption of fixed capital). It also defines general government final consumption as expenditure on goods and services.

Revenue	Expense	Balancing item
Total revenue	**Total expense**	Operating balance
Total revenue	**Expenditure=Total expense** + net acquisition of nonfinancial assets	Net lending / borrowing
Total revenue	**Expenditure=Total expense** + net acquisition of nonfinancial assets – net interest	Primary balance

For the benefit of readers with accounting backgrounds, the GFSM net operating balance is calculated in the same way as the IPSAS 'surplus/deficit', another accounting construct. However, the value of these two balancing items often differ due to differences between items included in the GFSM revenue and expense and those included in IPSAS revenue and expense

Beside these core balances, other GFSM concepts may be used for policy analysis. The most frequently used are:

- **Cash balance (cash surplus / cash deficit)**: Cash surplus (+) / Cash deficit (–) (CSD) is equal to the net cash inflow from operating activities minus the net cash outflow from investment in non-financial assets.
- **Overall fiscal balance**: net lending/borrowing, adjusted by transactions for public policy purposes. For example, subsidies given in the form of loans would be recognised as an expense (also called policy lending).

Specific issues

Government finance follows the accounting principle of 'substance over form'. Thus, certain transactions in the budget are:

- Netted, for example, netting of VAT flows of government units.
- Grossed, for example, the net cash flow of two transactions in different directions.
- Imputed, for example social benefits in kind provided by government employers to their employees.

- Re-routed, for example social security contributions paid by government employers are presented as if they were paid as wages and employees then paid them into the social security system (GFSM paragraph 3.28).

These statistical adjustments require additional data collection if budget accounting is on a cash basis.

Many countries are not yet able to compile the complete general government balance sheet. One reason is that it is difficult to value nonfinancial assets. In many partner countries, the problem may be simply to have a comprehensive and up to date asset register available.

F.18.2.5 THE GOVERNMENT SECTOR IN THE NATIONAL ACCOUNTS

The main treatment of national accounts can be found in Chapter F.17.

The government sector in the national accounts depicts the role of government in the economy. Unlike government finance statistics, national accounts are presented in both nominal and constant price statistics. Appropriate price deflators are therefore needed.

The core issues for the government sector in the national accounts are estimates of the values of government output, government final consumption of goods and services and gross fixed capital formation and consumption.

In general, the data requirements for compliance with the requirements of SNA 2008 are very similar to government financial statistics. Government financial statistics are often compiled by ministries of finance, whereas national accounts are usually compiled by National Statistical Offices (NSOs). There is a clear interest in working together, not least in ensuring that the two datasets are comparable.

In the national accounts, the government sector has two roles. Firstly, it provides transfers between and within sectors, notably in the form of taxation and provision of benefits and subsidies to households and other sectors. In addition, the government sector produces non-marketed services such as health; education; police and military services; and statistics. The public sector produces marketed goods and services such as transport and is normally in receipt of government subsidies for these purposes.

Purchase prices, including wage costs, are used to help value government final consumption of goods and services. Both government transfers and the output of government and public sector services also need to be valued for the national accounts. Issues relating to the valuation of produced non-market public services such as health and education, are covered in SNA2008 starting at paragraph 15.116.

Government investment in and consumption of fixed capital also need to be valued, especially where the capital goods are different from those purchased by the private sector.

F.18.3. Sources of data and metadata

Government finance statistics rely on administrative sources with some minor exceptions.

Revenue data on direct taxes, indirect taxes, including value added tax, and social contributions are collected by the agencies responsible. In the case of indirect taxes, the agency may be a customs and excise authority. Administrative structures vary from country to country – revenue collection may be centralised in a single authority. Revenue of government units is recorded by those units and incorporated in the overall government budget.

In most countries the State Treasury manages all cash transactions of government budget units. Often, a special unit manages the financing of government debt, providing data on government bonds and treasury bills and the interest paid on them.

Revenue and expenditure of extra-budgetary entities and of public sector organisations should be published by those organisations and be reported to the ministry or agency responsible for compiling government / public sector statistics.

Compilation of government financial statistics may, depending on the country, be the responsibility of the NSO, the ministry of finance / treasury or a dedicated agency.

Data availability

Government / public sector finance statistics are compiled in developed countries on a quarterly or, in some cases such as the USA, a monthly basis. Developing and middle-income countries generally produce data on an annual basis, although some produce quarterly data. In countries where governance is challenged, compilation of accurate government financial statistics is difficult.

Fiscal transparency and public sector accounting standards require that the accounting rules and the accounting basis are disclosed through published metadata.

The IMF Government Finance Statistics manual presents a comprehensive and detailed database of annual statistics submitted by member countries. In particular, the Statement of Government Operations (SOGO) provides the main aggregates of transactions: revenue and current expenses and net acquisitions of non-financial assets.

Most partner countries do not report a complete balance sheet for SOGO. Data on the stock of non-financial assets are often missing. The amount of liabilities corresponds more or less to gross debt. Data and methodological notes on IMF Government Finance Statistics (GFS) are available from the IMF website.

Box F.18.5: Metadata for government finance statistics

The IMF's Dissemination Standards Bulletin Board (DSBB) provides links to metadata reported according to the standards set by the Enhanced General Data Dissemination System (e-GDDS), used by most partner countries, and by the Special Data Dissemination Standard. SDDS is adhered to by developed countries and many middle-income countries which have or seek access to international capital markets.

The e-GDDS provides guidance for the overall development of macroeconomic, financial, and socio-demographic data. Through the GDDS framework, countries are encouraged to improve data quality, evaluate needs for data improvement, set priorities and disseminate reliable statistics.

Government finance statistics are covered by e-GDDS. Key metadata for many partner countries, can be found under the national 'Fiscal sector' rubric. Metadata is required to be updated at least annually. However, this is not regularly achieved by most partner countries, so the information may be out of date.

Access to annual national data is also provided.

The IMF regularly assesses the quality of government finance statistics, concerning timeliness, completeness, reliability, accessibility and consistency with statistical methodology. While the IMF considers a wider range of information than is presented on the DSBB, the presence and completeness of recent data and the freshness of update of the metadata are useful indicators of the availability of statistics on the government sector. Information concerning statistical quality is also available from the DSBB website. More information can also be found in section B.2.4.1.1 and section C.6.3.2.

An agreement between the IMF and Tanzania covered development of the latter's government finance statistics. This case study is explored in Box F.18.6.

Box F.18.6: Case study: Tanzania Government Finance Statistics

The United Republic of Tanzania has interesting government finances for various reasons. Its Mainland and Zanzibar governments operate separate accounts. The Mainland government accounts are considered the central government account and the Zanzibar government accounts are part of general government. The 2016 IMF document 'Implementing Accrual Accounting in the Public Sector' (page 2) showed Tanzania as one of the few African countries to have implemented modified accrual accounting.

In 2022, the IMF and Tanzania agreed an arrangement under the Extended Credit Facility. Its documentation provides information on both the IMF's understanding of Tanzania's government finance statistics (pages 27, 31-32) and on the improvements to these statistics agreed as being required (page 89).

Tanzania's available data on government finance on the IMF database, covering the 'Statement of Operations (Revenue, Expenditures, Net Lending/Borrowing and Financing)' for budgetary central government shows data available up to 2018. The e-GDDS metadata on central government finance statistics, accessible from the Dissemination Standards Bulletin Board (see Box F.18.5), was last updated in 2014.

The Tanzania Ministry of Finance and Planning publishes quarterly budget execution reports; the most recent of which appeared just over two months after the reference period, although the time to publication appears to be variable. Coverage is central government plus some data from local government.

F.18.4. Analysing data quality and identifying problems

The quality of statistics on government finances and the public sector critically depends on the accounting principles and practices applied. Government finance statistics and public finance management (PFM) depend on adherence to the frameworks for management, compilation of statistics, assessment and improvement. In particular, the quality of the PFM influences the availability, integrity, timeliness and other characteristics of the data sources used to compile government finance statistics.

Box F.18.7: Public Expenditure and Financial Accountability

The Public Expenditure and Financial Accountability (PEFA) methodology for assessing public finance management has been used in more than 150 countries.

PEFA examines country practices, organised into seven 'pillars':

- Budget reliability: The budget is realistic and implemented as intended.
- Transparency of public finances: Information on public financial management is comprehensive, consistent, and accessible to users.
- Management of assets and liabilities: Ensure that public investments provide value for money, assets are recorded and managed; fiscal risks are identified; and debts and guarantees are prudently planned, approved, and monitored.
- Policy-based fiscal strategy and budgeting: The fiscal strategy and the budget are prepared with due regard to government fiscal policies, strategic plans, and adequate macroeconomic and fiscal projections.
- Predictability and control in budget execution: The budget is implemented within a system of effective standards, processes, and internal controls, ensuring that resources are obtained and used as intended.
- Accounting and reporting: Accurate and reliable records are maintained, and information is produced and disseminated at appropriate times to meet decision-making, management, and reporting needs.
- External scrutiny and audit: Public finances are independently reviewed and there is external follow-up on the implementation of recommendations for improvement by the executive.

Within the seven pillars, the PEFA PFM framework defines 31 specific indicators disaggregated into 94 dimensions that focus on key measurable aspects.

The framework also assesses donor practices and the extent to which they affect PFM performance.

The World Bank's Open Knowledge Repository - Country Financial Accountability Assessment page presents PEFA-based country reports that consider national, sub-national and gender-responsive public financial management assessments.

Because fiscal policy plays a central role in promoting development, the methodology of fiscal management in partner countries is regularly scrutinised by international organisations. Various diagnostic and assessment methodologies for Public Financial Management (PFM) are specifically designed for partner countries. These tools are explored in the following section.

F.18.5. Improving sector statistics

Statistics on government finance and public sector are closely related to public finance management. The quality of the statistics is closely connected to the quality and definition of the data from government budgets, which form the basis for the statistics. Therefore, government finance statistics are usually developed in coordination with budget support actions, activities to strengthen PFM and other administrative reform. Government finance statistics provides important information for development planning and is thus of critical interest both to governments in partner countries and to their development partners. A linked aspect is whether funds are used efficiently and for the purposes intended.

PFM in each country is based on national legal and administrative traditions. Government finance statistics reflect this. The approach must therefore address country specific issues, based on compliance with the international statistical standards and concepts of government finance statistics and public finance management. A strategy should be devised, within the framework of the National Strategy for the Development of Statistics (see Guide Chapter C.7), for data collection, compilation and dissemination of the government finance accounts and national accounts of the government sector, integrated with plans for administrative reform.

Each country should consider establishing a forum at management level, as well as a permanent working group at expert level, covering the relevant agencies engaged in data collection, processing, analysing and using source data in their daily work. Core partners comprise the NSO, the Ministry of Finance / Treasury and the Central Bank. Data on elementary government revenue and expenditure are managed in the Ministry of Finance. Usually, the Central Bank collects data on financial flows and stocks in the frame of monetary statistics. Other stakeholders are line ministries, agencies and extra-budgetary institutions.

Access to detailed administrative revenue and expenditure data throughout government and the public sector is essential to develop good and comprehensive statistics. Priorities depend on the national context. A strategy can be based on the following steps:

- Register and classify the universe of central government, extra-budgetary, general government units and public sector units. The register must be maintained and updated.
- Similarly, establish an exhaustive government and public asset register that provides complete ownership links to government and public sector units. The register must be maintained and updated.
- Clarify differences between the current business accounting rules used by the budget units and both public financial management and government finance statistics concepts. Propose and prioritise changes to bring the budget structure more closely into compliance, taking into consideration the resources available.
- Adopt agreed frameworks (including software) for PFM in the Ministry of Finance and for government finance statistics in the NSO.
- Enable the statisticians to have access to basic administrative data at a level as detailed as possible. Ideally, this can be done by giving consultation access to the budget compilation information system.
- Identify and assess the potential of all missing transactions and prioritised sources of missing, non-conforming, such as insufficiently detailed; inappropriately classified; or regularly late budget data.
- Discuss with data providers the reasons for non-provision, non-conformity or regular lateness. Reasons may be legal, administrative regulations (or their interpretation), poor methods of source data collection / compilation, insecurity of data transmission, lack of technical knowledge or capacity, inefficient communications with the statistics office, political relationships or inertia.
- Draw up and implement joint assessments and plans for improvement in data provision. Each improvement action may have a cost attached and may involve third parties, such as local governments units as data providers to a line ministry. Implementation may require considerable time. Some actions may require legislation, for example to allow a ministry to provide detailed data to the NSO. Another example is initiating regular data collections on government units which are outside budget coverage.
- Assess and investigate whether supplementary or alternative data sources can be used. Data on government finance should be checked from 'mirror' sources. Data coming from the official budget can be checked with data on financing, usually collected by the Central Bank. Government accounts should be reconciled with data on other national accounts sectors compiled by the NSO.
- Assess and investigate methods of estimation and now-casting where data is inherently late or incomplete.
- Regularly assess the impact of the changes implemented on the accounts' conformity to principles and on the internal cohesion and thus the accuracy of published data.

Government finance statistics require special knowledge and highly qualified staff. Regular training courses are required to provide and update this knowledge to statisticians and budget experts. Examples should be tailored to the country situation, such as clarifying the differences between budget concepts and government finance statistics categories. The IMF is a key source of technical assistance – see Box F.18.8.

In addition, the OECD manages the component of the Pan-African Statistics II (PAS II) programme that supports the development of revenue statistics in Africa. Further details may be found in Box F.18.9.

Box F.18.8: IMF capacity development assistance in public finance systems and statistics

The IMF, with funding from the EU and other donors, is the primary partner for providing capacity development to public finance systems, including statistics. Its capacity development web pages provide resources and a link to country stories and technical assistance country reports, including public finance and related statistics.

One report, on the Lao People's Democratic Republic concerning Government Finance Statistics, covered a virtual technical assistance mission in 2021 to the Ministry of Finance to improve compilation of government finance statistics and public sector debt statistics. The two key mission outcomes were:

- Recent quarterly and annual government finance statistics were revised for analytical purposes using details of government expenditure data.
- Quarterly statistics on the social security fund for recent quarters were compiled based on monthly Social Security Fund operational data.

The mission also produced a detailed technical assessment, an action plan for further work and priority recommendations

Box F.18.9: OECD / African Union Commission 'Revenue Statistics in Africa' database and publication

The annual publication and database 'Revenue Statistics in Africa' is jointly undertaken by the OECD Centre for Tax Policy and Administration and the OECD Development Centre, the African Union Commission (AUC) and the African Tax Administration Forum (ATAF) with the financial support of the European Union through the Pan-African Statistics II (PAS II) programme. It compiles comparable tax revenue and non-tax revenue statistics for 30 countries in Africa. Extending the OECD methodology to African countries enables comparisons about tax levels and tax structures on a consistent basis, both among African economies and with OECD.

To find out more…

Methodological documents on government finance and public sector statistics

- IMF: Government Finance Statistics Manual (GFSM), 2014
- IMF: Government Finance Statistics (GFS) – Data, Companion Materials, and Research
- Eurostat: European System of Accounts 2010
- Eurostat: GFS methodology under ESA 2010 and ESA 2010 Manual on government deficit and debt
- Eurostat: Manual on sources and methods for the compilation of COFOG statistics — Classification of the Functions of Government (COFOG)

Public Financial Management (PFM) assessment tools

- PEFA: PEFA PFM framework
- World Bank: Country Financial Accountability Assessment (CFAA)
- African Development Bank: CFAA country reports

Databases:

- IMF: Dissemination Standards Bulletin Board (DSBB) – country and sector metadata and data, e-GDDS / SDDS
- IMF: IMF Fiscal Monitor
- OECD: Public governance and management
- OECD: Revenue Statistics in Africa
- Eurostat: Government Finance Statistics database
- UN Statistics Division: National Accounts Statistics database

Methodological documents on budget compilation and presentation

- OECD: International Budget Practices and Procedures Database
- IMF: Fiscal Transparency
- IMF: Reports on the Observance of Standards and Codes (ROSCs)
- International Public Sector Accounting Standards Board (IP-SASB): International Public Sector Accounting Standards (IPSAS)

Analyses on budget developments

- OECD: Government at a Glance
- European Commission – DG ECFIN: Public Finances in EMU

Statistics Explained

- Government finance statistics
- Stability and growth pact

F.19 Price statistics

F.19. Price statistics

The chapter in brief

This chapter covers the full range of price statistics, concentrating on the main indicators. These are the Consumer Price Index, Harmonised Consumer Price Indices, the House Price Index, the Producer Price Indices, Export and Import Price Indices, the National Accounts Deflator and the Purchasing Power Parities.

It starts with the uses and policy applications of price data explaining the differences between the various measures of prices and inflation.

The main price indicators and key methodology aspects are then presented providing guidance on the best international practices.

A brief description is provided of data sources to obtain the raw data required for the compilation of each price indicator. The chapter then identifies the main national and international data sources for price statistics.

Subsequently, the chapter looks at how to assess the quality of price data and concludes with a brief description of the main challenges normally faced by countries aiming to improve price statistics.

F.19.1. Policy applications

Prices are a measure of the relative value of goods and services in monetary terms. Price statistics aim at following the development of prices of goods and services, i.e., to measure changes in the overall price level – inflation, price stability or deflation – and to compare the overall level of prices between countries.

Price statistics series are usually indices. A price index can be understood as an aggregate price of all the different items (goods and services) that are included in a representative sample. In its reference period a price index is given a value such as 100; index values for later periods indicate the respective average change in prices from the reference period.

Inflation can be measured in different stages and sectors of economic activity. The figure that follows shows the relationship between basic price, producer's price and purchaser's price.

Measures of inflation aim at informing monetary, macroeconomic and fiscal policies, and decision making by households and investors and at obtaining volume measures of value added. They are also useful tools for international comparisons of economic performance.

Various indices are used for different purposes, including the following: .

Figure F.19.1.: Relationships between prices

BASIC PRICE
+
Taxes on products excluding invoiced VAT
-
Subsidies on products
=
PRODUCER'S PRICE
+
VAT not deductible by the purchaser
+
Separately invoiced transport charges
+
Wholesalers' and retailers' margins
=
PURCHASER'S PRICES

The source of the figure is the SNA 2008 manual.

- Consumer Price Index (CPI);
- Harmonized Index of Consumer Prices (HICP);
- House Price Index (HPI);
- Producer Price Index (PPI);
- Export and Import Price Indices (XMPI);
- Purchasing Power Parities (PPPs);
- Gross Domestic Product (GDP) deflator.

The CPI is the most common measure of inflation. It measures the changes over time in the purchase price for a sample of goods and services that is representative of consumer expenditure. It is normally used to represent the overall inflation rate of an economy, even though the index covers only products purchased by households. In most countries it is published monthly with a maximum delay of one month.

The CPI can be used to adjust the price of contracts in response to inflation – this is called price indexation. Most commonly indexed contracts are business contracts, rents and wages. Other types of income such as social protection benefits or from financial instruments can also be indexed. The CPI is also a means for evaluating changes in living standards. The CPI can also be used to compare inflation rates and hence monetary policy outcomes between countries.

Box F.19.1

"The CPI is a key macroeconomic indicator and widely used for assessing economic policy, for monetary policy purposes, and for macroeconomic planning. It is also commonly used by governments and central banks to set inflation targets."

Source: IMF (2020) Consumer Price Index Manual: Concepts and Methods.

The policy profile of the CPI is among the highest of any official statistics because of its direct relevance to the population and policy making. In many countries, the CPI is the only statistics series that is regularly updated on the National Statistics Office's (NSO) website. In addition, reports on the CPI are common in the media in most countries. High or rising inflation as measured by the CPI is used as common basis for claims of government policy failure, whether justified or not. It is also a common tactic to claim that governments manipulate the CPI, irrespectively of whether this is justified or not. For these reasons, it is very important that CPI is measured according to the international standards and is transparent with regards to the methodology options. Documentation of sources and methods and metadata should be made available.

When economies are closely linked and share common policies, such as a common currency, comparing inflation rates becomes crucial. To ensure comparability, the participating countries must harmonise the CPI, i.e., adopt -as far as possible- a common nomenclature and methodology; national consumption samples can be maintained. The EU Harmonised Index of Consumer Prices is known as the HICP. An HICP can also be used at sector level to compare the effects of each sector, e.g., of changes in energy prices, on each country's price level.

Since the 2008 financial crisis emphasis has been given to real estate indicators such as the HPI, also called Residential Property Price Index (RPPI). The HPI measures the price evolution for residential properties regardless of the purpose of the transaction, i.e., the purpose for which the property will be used; owner-occupation, vacation, rental market etc. The HPI is a key indicator to macro prudential supervision as it is known that declines in property prices adversely affect debt, borrowing, consumption and investment. Recessions are deeper and of longer duration when accompanied by house price bubble bursting. Within the EU this indicator is compiled by the NSOs but in many other countries the central banks are taking the lead.

A number of countries compile output PPIs[1] on a monthly or quarterly basis. This is a measure of the price change of goods and services at the "factory gate", i.e., the price at which they are sold by the producer (producer's price). The PPIs can be seen as a "leading" indicator of inflation since a price change at the producer will most likely be at least partially passed on to the final consumer. The PPIs are a set of sectoral indicators. Unlike the CPI there is not an overall PPI. Instead, a country will produce one PPI for each sector of the economy. Therefore, the sectoral coverage of the PPIs can differ substantially from country to country.

The XMPIs are measures of price changes of exported and imported goods and services. The export price index (XPI) covers the products sold by resident producers to the rest-of-the-world sector while the import price index (MPI) includes the products bought by residents from foreign suppliers.

External trade policy making requires price information as an input to analysing the potential impact of trade policy options, such as liberalisation, for example. Export and import price indices provide the necessary information.

Comparing price levels between countries is important for a variety of uses. The PPPs are a set of measures of relative price changes, not over time but between countries. They measure the cost of the same sample of goods and services in different countries. PPPs convert GDP and other measures of value into a common, artificial currency, eliminating the effect of price level differences across countries. Currency exchange rates do not meet these policy needs because they are determined not only by price level differences, but by other factors as well. The PPPs are also used by a number of international organizations, for example EU, UN, OECD, NATO, to adjust cost-of-living allowances.

International and regional policy purposes where PPPs are used include:

- Spatial comparisons of GDP and its expenditure components.
- Spatial comparisons of price levels.
- Grouping economies by their volume indices and price levels.
- Analysing changes over time in relative GDP per capita and relative prices.
- Analysing price convergence.
- Making spatial comparisons of the cost of living.
- Using PPPs calculated for GDP and its expenditure components as deflators for other values.

The GDP deflator is the ratio of nominal GDP over volume GDP. Only the GDP deflator (and series related to it) is a measure of price changes in the economy as a whole. This comes at the cost of less frequent publication. Results are available quarterly or annually, several months or even years after the reference period, and are subject to many revisions over time.

It is particularly important to select the price statistics that are based on the most appropriate concept for the stage of development of the economy that is to be analysed. Price changes in different parts of the economy can vary considerably. For example, consumer goods prices might increase much more slowly compared to investment goods prices in response to a currency devaluation.

Consumers, businesses, government and investors often need to understand whether a particular price, of petrol or telephone services for example, is increasing relative to other prices. In regulated sectors there is a clear policy interest in analysing sector price changes relative to other sectors.

1 Other measures of PPI can also be obtained, such as input PPI and value-added PPI.

Telecommunications is a good example, as are the prices of agricultural products (see section G.26.2.3). The CPI and PPI provide useful information for this purpose.

The importance of the CPI to economic and monetary policy, its relative ease of compilation and its public profile makes it a high priority in all countries. The PPIs are also often given a fairly high priority, although achieving reasonable accuracy requires a considerable sustained effort. XMPIs have a lower profile, partly due to the difficulties in their compilation. GDP deflator calculation is also accorded a lower profile even though, in principle, every country that estimates GDP growth also has an estimate of GDP deflator.

Box F.19.2: Key uses of price statistics in policy making

The key uses of price statistics in policy making are the following:

- The CPI is used for price indexation of contracts, macroeconomic policy and monetary policy making.
- The HPI is a key indicator to macro prudential supervision.
- The PPIs can be seen as a "leading" indicator of inflation and can be used for contract indexation and macroeconomic policy making.
- XMPIs are needed for external trade policy making.
- The PPPs are mainly used for comparing price levels between countries.

F.19.2. Concepts and definitions

This section covers the main methodology concepts of the indices presented in the previous one. As explained already, price statistics are designed to record price changes in different parts of the economy or levels among countries. Changes are measured by the compiled indices. The index is a function of a weighted average of prices of a sample of products. The CPI product sample is often referred to as basket and is a list of the most representative goods and services that are acquired by households. The PPI product sample is a list of the most representative goods and services sold by domestic businesses. The weights are proportions that reflect the relative importance, or share, of each product as part of the total sample.

To identify the most representative products and calculate the weights a detailed survey or census is used to collect precise information about the goods and services exchanged and the total value paid or received for those. A household budget survey (HBS) is usually used for the CPI. A business census or detailed survey is needed for the PPI.

The goods and services bought or sold are organised into elementary groups of similar products according to a standard classification. Within each elementary group, representative product varieties are selected. Their price movements, taken together, provide a good estimate of the overall change in prices for the elementary group as a whole. The price change of the elementary group is calculated as the average of the price changes of these varieties from the base period to the current period. The price changes of each elementary group are progressively aggregated to the overall index using the weights.

The sample of representative goods and services and the weights need to be updated to reflect changes in consumer preferences as well as the emergence of new products. Therefore, the HBS and the business survey should be undertaken at least every 5 and 10 years, respectively.

The HBS and the business survey should provide information on the value of purchases made in each region and each type of outlet/company. The expenditure structure can vary between different parts of a country and between rural and urban areas. Prices can also be different in various outlet types or companies within the same region. Outlets and companies are therefore selected for the price survey to reflect the value of transactions that are made in each region and each type of outlet or company.

The deadlines for the release of price statistics data are very tight. Monthly indices should be published no later than the following month, while quarterly indices should be published between 45 and 90 days after the reference period. Price indices are not subject to revisions, except for the HPI and major errors in the other indices. The release calendar should be available to users and strictly followed.

F.19.2.1. THE CONSUMER PRICE INDEX

The key publication on international standards for CPI compilation is the 'Consumer Price Index Manual: Concepts and Methods'. The Manual was endorsed by the 51st Session of the United Nations Statistical Commission as an official statistical standard and was published by the International Monetary Fund (IMF) on behalf of the group. The Manual defines the CPI as follows:

"CPIs measure changes over time in the general level of prices of goods and services that households acquire (use or pay for) for the purpose of consumption."

CPIs provide regular measures of changes in consumer prices that need to be unbiased and comparable. There is a standard framework that allows countries to produce comparable CPIs. This framework consists of:

- The classification of goods and services;
- The methods used to define the basket of goods and services, their weights, and the sample of outlets;
- The calculations used to derive unbiased measures of the average price changes.

The Classification of Individual Consumption by Purpose (COICOP, 1999 version) is the standard classification used to identify and classify all consumer transactions in goods and services. In the EU, a slightly modified version of COICOP is used for the HICP. COICOP was updated to the 2018 version, which, however, is currently in use in very few countries. Its wide adoption is expected to be gradual [2]. More information about COICOP is provided in section B.5.2.8.

2 COICOP 2018 is expected to be introduced in the HICP in January 2026

Specific, representative products are selected through a HBS to cover a large proportion of household expenditures. Similar goods and services are organised into elementary groups, using COICOP. In economic terms, each elementary group is made up of goods and services that are close substitutes for one another. Within each product, specific varieties are selected to be representative of the product. Prices are then collected for those specific varieties. The index for each elementary group of goods and services is calculated first. At this level, the aggregate index is calculated using bilateral indices as the arithmetic (Dutot index) or (preferably) the geometric mean (Jevons index) of the relative price changes of each variety. The increasing use of scanner data has been leading countries from the use of bilateral to multilateral indices.

Weights may be calculated or estimated from the HBS to represent the proportional expenditure on each elementary group and / or to take into account the amount of money spent in different types of points of sale and / or regions. Weights are usually not used at the elementary level since the HBS is rarely detailed enough to give sufficient knowledge about the relative amounts spent on each variety, unless transaction data obtained from scanner data is available. In this case weights are available at the item level.

The next step is to calculate price indices for higher level groups that cover a wider proportion of consumption. The overall CPI is calculated at the top level. At each level, the sub-indices are calculated as the weighted average of the sub-indices of the level below. As the weights (quantities) for higher levels are kept constant it is a Laspeyres price index. Regional CPIs are aggregated to a national index in much the same way.

Although the CPI is often used as a measure of the cost of living, a Laspeyres price index is not a true cost of living index. This is because consumers are likely to buy more of goods and services that become relatively cheaper over time and less of those that become more expensive. As the HBS, from which information was taken to select the products and calculate the weights, becomes more distant in the past, the upward bias becomes greater. In many countries, weights are updated every year.

Although the CPI needs to have national coverage, there exists a wide range of policy questions for which measures of price changes are needed that concern parts of a country's economy. The most evident of these are regional price indices, as well as indices that cover only urban or rural expenditure. Where there exists a large disparity in income and wealth between the richest and poorest of the country, the much greater expenditure of the wealthy will dominate the overall CPI. In this situation, one possibility would be to prepare 'sub-indices' based on, for example, the expenditure baskets of the lower quartile, the middle two quartiles and the upper quartile of the population by income. Alternatively, some countries exclude the expenditure of the highest earners. In this case, the resulting index is better at measuring the changes in the cost of living as perceived by the majority of the population than it is at measuring overall inflation.

Clearly, extending the price collection survey to a wider area is costly and may be difficult to organise, especially outside major urban areas. On the other hand, consumption transactions are more concentrated in urban areas. Hence, only a relatively small geographical extension of the survey outside of major urban areas may be necessary. It is possible to analyse whether price changes are significantly different between regions on the basis of a pilot price survey or other data sets.

Another type of restriction on CPI coverage occurs when only certain types of outlets are covered by the price survey: only traditional markets, for example, or only shops or supermarkets. Price levels and changes are often different in different outlet types. Full price survey coverage requires that all existing types of outlets, such as supermarkets, local or traditional shops, open markets, roadside stalls and itinerant hawkers be surveyed. As soon as internet-based sales become significant in a country, they also need to be included.

Many goods and services are only available or only widely purchased during part of a year: seasonal fruits and vegetables and clothing are two obvious examples. The prices for the out-of-season products should be estimated. For the first out-of-season month a "typical price", which is normally an average of the prices during the in-season period, is taken. For the following out-of-season months there are two ways of estimating the prices: all-season estimation or counter-seasonal estimation. While the first uses the average rate of change of the prices of all products within the same elementary group, the second uses only the price changes on the in-season items, within the same elementary group.

For a variety of reasons, a variety may be missing from the market and therefore its price may be unavailable. When the variety is considered to be temporarily missing its price is estimated as for the seasonal products. If the variety is missing for three consecutive months, it should be replaced. A replacement variety with similar characteristics should be found in the same outlet. Often the old and the new varieties are not exactly the same and their prices cannot be directly compared. For example, new models of smartphones, laptops, cars etc. have better performance than those they replace and consumers prefer the characteristics of the new variety to the old one's. This is a considerable problem: new and improved varieties are continually introduced to the market and appropriate methods to quality adjust need to be applied.

In that sense, the use of short-term relatives, i.e., comparing the price of an item in two consecutive months instead of comparing the price in the current month with that of the base period is recommended. The short-term index allows to continue comparing like-with-like since for the new variety is normally possible to obtain the price of the previous month and no complex and resource-intensive quality adjustment is required.

Statisticians need both training and experience to know how to identify and apply appropriate quality adjustment methods. Some countries can find it difficult to keep this skilled staff within price statistics teams that are mostly involved in relatively routine operations.

Compilation of the CPI is usually carried out using a software package based on a database. The CPI software applies the methods used to average price movements.

F.19.2.2. HARMONISED CONSUMER PRICE INDICES

Any discussion of the CPI needs to be completed by analysis of harmonised CPIs. These are used for comparing policy outcomes between countries and are particularly important for monetary policy in monetary unions.

The HICP is mandatory only for EU Member States, but many other European countries also disseminate it. Almost all EU Member States maintain distinct national CPIs. They do so because of national legislation mandating indexation to the national CPI. The cost of maintaining two sets of price indices is rather low since most countries use the same price survey for both.

The key methodological publication on the HICP is the 'HICP Methodological Manual' prepared and published by Eurostat. Its guidelines have been followed by other regional organizations as the basis for other harmonized CPIs. According to the HICP manual:

"Within the European Union (EU), a specific CPI has been developed — the harmonised index of consumer prices (HICP). The HICP is calculated according to a harmonised approach and a single set of definitions. The key HICP aggregates are the euro area index, covering the countries whose currency is the euro, and the national HICP for each of the EU Member States. The national statistical institutes produce the national HICPs, while Eurostat produces the country-group aggregates. The production of the HICP, its methodology and the data to be sent to Eurostat are governed by EU law."

In some countries, harmonised CPIs are only embarked upon if there is an overwhelming policy need. The West African Economic and Monetary Union (Union Economique et Monétaire Ouest Africaine, UEMOA) requires a harmonised regional price index to inform its monetary policy. The Indice Harmonisé des Prix à la Consommation (IHPC) (English: Harmonised Index of Consumer Prices) has covered the eight UEMOA members since 1997. Data is available monthly on the UEMOA website. Further information is given in Box F.19.3.

The Common Market for Eastern and Southern Africa (COMESA) has adopted a Harmonised Consumer Price Index (HCPI-COMESA), based on a harmonised methodological and conceptual approach for its 21 member states[3]. The same stands for the Southern African Development Community's (SADC) 16 Member States[4].

The COMESA and SADC HCPIs are used for measuring regional price stability and macroeconomic convergence and for international comparisons of inflation. This objective indicator of regional price changes is also intended to act as a pointer to the regional market for the investment community. Regulations relating to key issues of the HCPI-COMESA were adopted in August 2010 and further improved in November 2012.

For both COMESA and SADC, development of the HCPI is a two-stage process. The first stage, which has produced the current, interim HCPIs of the respective regions, focuses on implementing 11 harmonization topics (based on implementation Regulations): the framework; product coverage; formulae; domestic concept; outlets; weights, treatment of missing items and introduction of new products; seasonal goods; second-hand goods; data transmission and publication standards. The HCPI is a Laspeyres-type index, calculated monthly, following the COICOP classification, with Jevons (the geometric mean) recommended for elementary price aggregations and December 2010 defined as the index base and price reference period.

3 Burundi, Comoros, Congo, Dem Rep., Djibouti, Egypt, Eswatini, Eritrea, Ethiopia, Kenya, Libya, Madagascar, Malawi, Mauritius, Rwanda, Seychelles, Somalia, Sudan, Tunisia, Uganda, Zambia, and Zimbabwe.

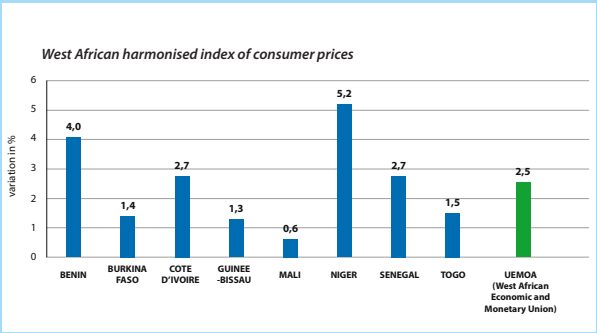
4 Angola, Botswana, Comoros, Democratic Republic of Congo, Eswatini, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Tanzania, Zambia and Zimbabwe.

Box F.19.3: West African harmonised index of consumer prices

The UEMOA operates a harmonised regional consumer price index (Indice Harmonisé des Prix à la Consommation, IHPC) to inform its monetary policy. Eight countries participate.

IHPC methodology was initially defined by UEMOA regulation 05/97/CM of 16th December 1997. Since October 2018 a new improved methodology was established by the regulation N°03/2017/CM/UEMOA. This regulation sets a common methodology required to be used in all eight member states. The IHPC updated its base year from the previous 2008 to 2014 in January 2017. It is a Laspeyres-type index. The definition of consumption is that of the national accounts. The reference population consists of all resident households. Within each of the eight member countries four or five geographic areas are defined in order to cover the national territory of each one. The weights are based on consumer expenditures obtained from the household budget surveys and/or the poverty and living conditions surveys undertaken during the period 20011-2014. Expenditures are classified according to the Nomenclature de Consommation Ouest Africaine pour l'IHPC (NCOA-IHPC) derived from the COICOP. The expenditures data collected before 2014 were updated using the inflation rate. The samples of the products of the member countries cover, on average, 650 items and the number of selling points where price data are collected varies between 1403 and 5182 depending on the country. Within the UEMOA member states a minimum of 7400 price quotes are collected every month. Each country's weight is equal to the share of its main urban area consumption expenditure in the total household consumption in the urban areas of all member states.

At the request of the UEMOA Commission, AFRISTAT will begin a survey of household expenditures in the capital cities of the member states to update the IHPC weights. Furthermore, a new software for the IHPC calculation is being developed.



Sources: UEMOA IHPC website; Afristat IHPC website

F.19.2.3. HOUSE PRICE INDEX

There are two reference publications on real estate price indices: the Technical manual on Owner-Occupied Housing and House Price Indices, prepared and published by Eurostat and the Handbook on Residential Property Prices Indices (RPPIs), prepared by the Inter-Secretariat Working Group on Price Statistics (IWGPS) and published by Eurostat in 2013 on behalf of the group. The Manual defines the HPI as:

"The House Price Index (HPI) measures the change in market prices of all residential properties that are purchased by households."

The HPI and the RPPI are both measures of the price increases in residential properties. The key difference lies in the fact that the HPI is the official measure for EU Member States and the relevant legislation makes mandatory a breakdown of the indicator into new and existing dwellings.

Over 70 countries worldwide currently compile an HPI including countries such as Cambodia, Colombia, Peru and Uganda, and many others have started working on its development such as Iraq, Kenya, Uzbekistan and Zambia. The RPPI has been included in the Financial Soundness Indicators since 2002 and is covered in the G20 Data Gaps Initiative which was launched in 2009 in response to the financial crisis. The RPPI is a key indicator for measuring risk exposures and a crucial indicator to support macroprudential and monetary policies.

To compile an HPI, data related to the transaction price as well as key characteristics[5] of the dwellings are required to ensure a constant-quality index. This is a challenge given the infrequent sales and the heterogeneity of residential properties. Quality adjustment techniques are required.

The most commonly used methods to compile an HPI are stratification with simple averages and hedonic methods. To measure the change in house prices one can compare the average price of properties sold in the current period to the average prices of properties sold in a previous period. However, due to the extreme heterogeneity of properties being sold in different periods this would produce a very biased indicator. Stratification can help control for the quality differences between strata, but the mix of dwellings within a stratum will still tend to be rather heterogeneous. Other quality adjustment techniques, such as hedonic methods, are used within the strata to account for the heterogeneity. These methods consider a product, in this case a house, to be composed of a set of characteristics and its price to be the sum of the individual prices of those characteristics. Since these characteristics are not sold separately, their prices cannot be observed but they can be estimated with hedonic regressions. These are often referred to as "shadow" prices and based on those the quality adjustments can be performed.

Box F.19.4: The RPPI/HPI project developed by the National Bank of Cambodia (NBC) with the support of the Data for Decisions (D4D) Fund, 2019-2022.

The NBC began collecting loan-level data from Cambodian mortgage lending institutions from October 2019 to use in the compilation of a new RPPI. Data are available from 2019. However, due to the low quality of these data, the RPPI is compiled with data from January 2020. Extensive technical assistance was provided to the NBC staff on the compilation methods, data analysis and programming.

The RPPI is a monthly indicator released 30 days after the reference period that covers the main cities and regions of the country stratified into "Capital city" and "rest of the country". These strata indices are aggregated using weights to obtain an overall index. The weights are updated annually based on the total transaction value of the previous year. The RPPI is an annually chain-linked Laspeyres-type price index that uses 2020 as the index base period.

The method selected is the time dummy hedonic approach with a rolling window of 18 months.

NBC launched the RPPI in a public event on the 6th of June 2022.

F.19.2.4. THE PRODUCER PRICE INDEX

The reference document for PPIs is the 'Producer Price Index Manual: Theory and Practice'. This was prepared by the Inter-Secretariat Working Group on Price Statistics (IWGPS) and published by the IMF in 2004 on behalf of the group. The Manual defines the PPI as:

"…an index designed to measure the average change in the price of goods and services either as they leave the place of production or as they enter the production process."

The relevant prices for a PPI should be the basic prices actually received by the producing company for sales within a country.

The PPIs are monthly or quarterly indicators. PPIs can be used to measure either output or input prices. As with the CPI, regional sub-indices can be calculated. As mentioned before there are PPIs per economic sector as defined by the International Standard Industrial Classification of All Economic Activities (ISIC Rev.4), or the Statistical classification of economic activities (NACE)[6] in the EU. The most commonly compiled PPIs are for manufacturing, agriculture, construction and mining. More recently, services PPI have high demand especially for tourism and technology, both being very important sectors.

The international product classification recommended for PPIs is the Central Product Classification (CPC Ver. 2.1) or - the EU equivalent - the Classification of Products by Activity (CPA Ver. 2.1). More information about ISIC and CPC is provided in sections B.5.2.1 and B.5.2.4 respectively.

5 Key characteristics refer to structure and location attributes such as usable floor area, number of rooms, district, region, property type, age, new or existing, completion state, renovations, etc.

6 Currently, version 2 is in use. However, version 2.1, adopted in October 2022 will enter into use from 2025 onwards.

The compilation of the PPI follows the same methodology described for the CPI. The weights are calculated with producer output prices obtained as part of the business survey cycle, which is described in chapter F.21. Specific price data collection surveys are carried out monthly or quarterly depending on the periodicity of the index.

Companies are usually classified as large, medium and small. Normally large companies are not sampled; instead, they are all surveyed. The medium and small companies should be sampled. One of the most straightforward sampling techniques is the 'cut-off', that is selecting for the survey the medium companies with higher output value until 70% is covered. This should be done according to activity sector and geographic stratification. The same can be done separately to select small companies.

To the discussion of business surveys in Chapter F.21 can be added that many low-income countries have significant difficulties in this area. Problems arise both in maintaining an up-to-date business register and in obtaining full and correct responses to the business surveys. The difficulties with obtaining responses to business surveys are partly due to a lack of understanding among businesspeople of the need for statistics. Also, often the price data obtained from business surveys are unit prices of heterogeneous products resulting in unreliable and biased PPIs.

F.19.2.5. EXPORT AND IMPORT PRICES

The international reference document in this area is the 'Export and Import Price Index Manual: Theory and Practice', published by the IMF in 2009 on behalf of the Inter-Secretariat Working Group on Price Statistics (IWGPS). This provides the following definition:

"Export and import price indices (XMPIs) for a country measure the rate of change over time in the prices of exported and imported goods and services. An export price index (XPI) measures the rate of change in the prices of goods and services sold by residents of that country to, and used by, foreign buyers. An import price index (MPI) measures the rate of change in the prices of goods and services purchased by residents of that country from, and supplied by, foreign sellers."

The Manual draws a key distinction between two methods of collecting prices for exports and imports:

- Export and import unit value indices, based on international merchandise trade statistics;
- Export and import price indices, based on company price survey data, as with PPIs.

Unit values are average prices of exports or imports of similar products that are calculated from price and quantity data.

The Manual recommends (page xiv) that:

"... countries using unit value indices with limited resources undertake a staged progression to price indices primarily based on establishment surveys. The initial stage will be to collect price data from establishments responsible for relatively high proportions of exports and imports, particularly those with a relatively large weight and whose unit value indices are at first view inadequate measures of price changes… It may be that the progression is much quicker, to prepare for the formation of a customs union and loss of intra-union trade data. If the country compiles a producer price index (PPI), much of the technical skills required, and the basis for data collection, will be in place." [7]

This appears to be a very challenging recommendation for many low-income and some middle-income countries since those find it difficult to collect data systematically from all but the largest companies. On the other hand, these large companies often carry out a major proportion of international trade. The strategy described by the Manual is based on starting trade price data collection with these companies. Collecting the prices of imports and exports can also be difficult to implement consistently.

The remainder of this section is concerned with examining how international trade statistics are used to derive import and export unit value indices. Although it is possibly cheaper, the Manual considers that this method does not yield as accurate results as collecting trade price data from trading companies.

Trade volume data (i.e., quantity in net mass or in supplementary quantity) is less widely collected and validated in some countries than is data on the money value of imports and exports. This situation could be more pronounced for exports than for imports in some countries because trade statistics systems are based on Customs reporting. Customs services have an inevitably greater interest in imports that attract tariff revenue than in exports. Moreover, since most tariffs are based on value, less attention is paid to volume data.

Problems with collecting the volume data that are needed to calculate import and export unit values can be addressed through improved formalised co-operation with Customs organisations. In common with other trade statistics, unrecorded trade has a detrimental effect on the quality of import and export unit values.

A standard check on national trade statistics is the use of reconciliation or mirror trade statistics. Mirror statistics is the use of the imports compiled by the country where the reference country is exporting to, and the other way round. These are valued differently from directly measured trade statistics[8] and so their use is limited at best for export and import unit value indices.

For detailed discussion of international merchandise trade statistics please refer to chapter F.20.

7 A contrary recommendation is made in the Producer Price Index Manual (page 68, paragraph 2.48). However, the 'Export and Import Price Index Manual' is more recent and significant research is currently being undertaken on the use on unit values in the PPI.

8 Cost, insurance and freight (CIF) for exports and free on board (FOB) for imports.

F.19.2.6. GDP DEFLATOR

National Accounts are covered in chapter F.17. National accounts use appropriate price statistics as 'deflators' to convert current price to constant price data series. Constant price data series are statistics where the effects of price changes between one period and the next have been removed.

The GDP is first calculated at current prices and its components are deflated by the appropriate price index to obtain GDP at constant prices (or volume GDP). Constant price GDP requires the use of a wide range of deflators based on price statistics, including the CPI, PPI, XMPIs and HPIs. In countries where the full range of price indices is not available the tendency is to use the CPI sub-indices to deflate all segments of the national accounts. This introduces inaccuracies into the national accounts and so into the measurement of GDP.

The ratio between the GDP at current prices and GDP at constant prices provides an estimation of the overall inflation on the economy known as the GDP deflator.

GDP growth rate, one of the most commonly quoted statistics, is the change over time of GDP at constant prices.

F.19.2.7. PURCHASING POWER PARITIES

The main methodological publication on PPPs is the 'Eurostat-OECD Methodological Manual on Purchasing Power Parities'. It defines the indicator as follows:

"PPPs serve both as currency convertors and as spatial price deflators. They convert different currencies to a common currency and, in the process of conversion, equalise their purchasing power by eliminating the differences in price levels between countries. Thus, when the GDPs and component expenditures of countries are converted to a common currency with PPPs, they are valued at the same price level and so reflect only differences in the volumes of goods and services purchased in the countries."

Worldwide, the World Bank manages the implementation of the International Comparison Program (ICP) under the auspices of the United Nations Statistical Commission, and relies on a partnership of international, regional, sub-regional, and national agencies. The ICP collects comparative price data, calculates the PPPs and compiles expenditure values of GDP components measured in a "common artificial currency by applying the PPPs to expenditures in national currencies". Eurostat and OECD cooperate on the compilation of the PPPs for their member states. The Eurostat-OECD PPP Programme cooperates closely with the ICP and provides the PPPs for European and OECD countries. Regional programmes are managed by regional organisations. For example, ICP-Africa is managed by the African Development Bank (AfDB); ICP in Asia and the Pacific by the Asian Development Bank. This procedure enables uniform quality standards to be set, capacity building to be undertaken and the data to become rapidly available locally for national analyses.

In general, the compilation of the PPPs requires that countries report prices and expenditure data on comparable products within the region to the regional organization the countries belong to according to a harmonized methodology. The World Bank will then generate the global results.

The most recent ICP round, whose results were released in May 2020, is a global initiative with the participation of 176 countries and reference year 2017. The previous ICP round was conducted for reference year 2011. The next ICP round is being conducted for reference year 2021 and results are expected to be published by the end of 2023.

F.19.3. Sources of data and metadata

F.19.3.1. THE CONSUMER PRICE INDEX

The CPI requires data on prices, outlets, and households' expenditures. In most countries, price data are collected monthly from outlets. These data are supplemented by prices obtained from providers of services such as electricity, education, telecommunications and postal services.

In some countries the almost exclusive method of price collection is that where statistical officers visit in person the points of sale, collect data on paper forms, enter them on computer, transmit them to the national centre and check them at various stages. The procedures vary considerably between countries the logistics often being complicated.

The use of tablets to replace paper forms has been increasing significantly. Tablets allow for many data checks on-site and more timely automated data transmission to the national centre. Countries may have access to funding from international organizations for this investment and the cost savings and data quality improvements are significant.

Prices are often collected from websites particularly for flights and electronic products. Online price collection became more widespread due to the movement restrictions imposed by governments in many countries during the COVID-19 pandemic.

Other data sources, such as scanner data and web scraping, are new but several countries have projects for their implementation as for example Peru and Kazakhstan. Scanner data are large data files obtained from retailers, which contain all transactions registered through product barcode scanning at checkout. Web scraping allows to retrieve largely automatically all data from a website including detailed product specifications useful for the quality adjustments.

The CPI should have national coverage. The price collection ought to represent the geographical distribution of consumer transactions. However, in some countries only urban areas are covered or even only the major cities. Limiting geographical coverage gives the CPI an urban bias, which is detrimental to its accuracy. This is especially the case in countries where prices can change at different rates in different regions. As mentioned before a survey should be conducted in the rural areas and towns to confirm if price differences are significant and thus if the price collection

should be extended. Moreover, price collection in rural areas should cover a smaller number of products, namely food and beverages, since other products are usually purchased in the urban areas.

The CPI basket of goods and services needs to reflect the detailed structure of consumption patterns of all residents. The sample of shops should reflect consumer preferences as well as guarantee the geographic and outlet type coverage. The weights require information on the expenditures by product. The source of this information is a detailed national survey such as the HBS. The CPI Manual notes that (pp 53):

"Expenditure data can be obtained from different data sources with household budget surveys (HBSs) being the most common."

The key issue here is that the HBS needs to be designed with the consumer price index in mind. The nomenclature of consumer goods and services adopted in the HBS needs to be compatible with the national classification of consumption transactions, normally COICOP and all households should be covered both in urban and rural areas. Since updating the CPI is not the primary purpose of the HBS, the desired outcome requires the NSO departments responsible for them to appreciate the need for effective coordination and to carry it out. This is not always the case.

Ideally national accounts are used to compile the higher-level weights and the HBS is used to break down the expenditures shares and to sample the products. EU Member States have been using national accounts data for t-1 since 2021. The HBS also provides information about preferred products and outlet types to support the basket and the outlet sample design.

However, in many countries national accounts data are less accurate and the HBS is conducted infrequently. As a result, the weights become outdated affecting the CPI accuracy. Alternative data sources can be used to update the weights such as business surveys and fiscal data. However, this may not be applied due to capacity constraints.

The Harmonized CPIs use the same data and therefore the same data sources.

F.19.3.2. HOUSE PRICE INDEX

Detailed data on transactions are needed for the HPIs. These may be found from a variety of sources including websites, real estate authorities or surveys conducted by NSOs. Website data can be retrieved automatically by web scraping or by asking the website owner to transmit them. Care must be taken to understand the coverage of these data, i.e., whether they cover the whole country and all types of sellers and properties. In addition, website data typically refer to asking prices rather than transaction prices. The NSO can also survey agents and developers to obtain residential real estate prices and related information. However, surveys are highly costly and response burden is not to be underestimated. The most commonly used data source are the national land registries. These normally cover all transactions in all geographic regions, are the least costly option and do not place a significant burden on respondents. Another possible source of information to compile RPPIs is mortgage data. However, cash transactions are excluded. In lower income countries, the mortgage sector may have very weak coverage – especially outside the major cities.

F.19.3.3. THE PRODUCER PRICE INDEX

Weights data for the PPIs are obtained from business surveys. The value of output is used for the calculation of the weights. It shows the share of each producer in the index. The data on prices should be collected by means of a survey where the most representative varieties produced by each company are sampled and therefore surveyed every period. Often, unit prices are used. However, care must be taken to calculate unit prices on homogeneous products. An initial survey is undertaken to identify, with the assistance of the companies being surveyed, the most representative, i.e., the most sold, product varieties with detailed specifications on their characteristics.

F.19.3.4. EXPORT AND IMPORT PRICES

The XMPIs require data for the weights and for the prices. The weights, i.e., the value shares of exports and imports can be obtained from customs data, which have normally good coverage of all merchandise trade. These data are also used to identify the most relevant exporters and importers. It is often the case that a small number of companies account for a large proportion of the external trade: surveys for price data can be addressed to those.

Mirror statistics are often used for the data collection of XMPIs. In this case, data are obtained from the counterpart countries. Further details can be found in chapter F.20.

F.19.3.5. PURCHASING POWER PARITIES

PPPs are compiled by international organizations (OECD, EUROSTAT, World Bank, ADB etc.) with data provided by the member countries. As with the other indices, data on expenditures for the weights and data on prices are needed. The weights data are estimated using national account indicators (GDP) for the reference year. The prices data are national average prices, i.e., average of the several price quotes collected all over the country during a certain period of time that should be sufficient to account with the seasonal variations. A main challenge is the product sample. Prices should be collected for products which are representative in each country and comparable among countries in the region. The price collection is implemented in the same way as for the CPI. The consumption patterns can vary significantly between countries and therefore, these two requirements are not complementary. Samples are usually drawn within the framework of the regional organization. For example, European countries meet regularly to select the products for the European sample.

F.19.3.6. AVAILABILITY OF PRICE INDICES DATA

Data on the CPI is often the only national data series which is published on a country's website. The NSO is the usual producer of the CPI and PPI but in some countries these are published by the Central Bank.

The primary global source of price statistics is the IMF International Financial Statistics database[9]. The CPI and the PPI may be found under "Prices, Production and Labor". The XMPIs may be found under "Trade of goods".

The IMF is also the main source of metadata on price statistics through the National Summary Data Pages (NSDPs)[10].

The International Comparison Program data and metadata are available from the World Bank website[11].

On its website, Eurostat provides free data and methodological notes and guidelines on the HICP[12], HPI[13] and PPPs[14]. Data and information on the PPIs and the XMPI are available in the web section[15] on Short-Term Business Statistics.

The OECD compiles and publishes price indices in its statistics website[16].

F.19.4. Analysing data quality and identifying problems

For the assessment of the quality of the indices produced following a system such as DQAF – Data Quality Assessment Framework[17] is highly recommended. In short, the quality of the indices depends heavily on the quality of the input data, their coverage, the timeliness of publication and their compliance with the international methodology standards. International comparisons and analyses, require that the international standards and classifications are respected, and that metadata documentation is available.

When large datasets are used for the compilation of any price index, data analysis is key to obtain an accurate result.

Firstly, as soon as a (monthly or quarterly) data file is received some basic checks are recommended, to identify issues such as:

- an empty file;
- incorrect date;
- a file with unrecognizable characters;
- duplicated observations;
- binary variables with numbers other than zero or one.

The size of the file, the variables, and the number of observations in it should be compared with the previous files to assess the reasonableness of these indicators. The variables should be always the same, i.e., the features of the data collected must be stable over time. A frequency table of each variable is useful to assess data quality since these frequencies should be rather stable.

A summary statistics table and histograms, or boxplots can easily be generated to assess the existence of outliers and missing values. To identify outliers and proceed with data cleaning a plausible range of values is determined for each variable and all observations that fall outside of the range are tracked. This range can be developed using a variety of statistical techniques such as taking the inter-quartile range. Another frequently use outlier deletion measure is Cook's distance.

F.19.4.1. THE CONSUMER PRICE INDEX

The CPI should be published monthly (however some countries such as Australia produce quarterly CPI), four weeks after the reference period, according to a release calendar disseminated in the beginning of the year, with national coverage, both for the weights and for the price data. The weights data should not be older than five years. All types of outlets should be covered by the price survey.

As a good practice the data should be available online in the format of a brief publication with some detailed descriptions, indices, weights and sub-indices at 4-digit level of COICOP. The weights and reference period should be indicated clearly. Rates of change and contributions of each sub-index to the change of the overall index should also be included. The long-term series should be available for download as an Excel file. Documentation on sources and methods, i.e., the metadata, should be available online and always kept updated. This document should describe the key methodological aspects. In addition, internal documentation with clear guidance for price collection should be prepared, as well as documentation on the compilation software, especially for the validation procedures and the aggregation formulae.

Input data – prices – should be checked ideally on site, i.e., at the outlets, by the price collectors so that corrections can be done immediately instead of going back to the outlet. When price collection uses tablets, these checks are easier, while checks on paper are less straightforward. In any case, limits for price variations are set up and all price changes that exceed the threshold are checked. Another way of checking is defining minimum and maximum prices. At the office, the reasonableness of the index movement should be assessed.

9 IMF data home page
10 Dissemination Standards Bulletin Board (DSBB) home page
11 World Bank Databank - ICP 2017
12 Eurostat HICP overview page
13 Eurostat Housing Price Statistics overview page
14 Eurostat Purchasing Power Parities (PPPs) overview page
15 Eurostat Short-term Business Statistics (STS) overview page
16 OECD.Stat database
17 IMF - Introduction to the Data Quality Reference Site

F.19.4.2. HOUSE PRICE INDEX

All the recommendations for the CPI presented in the previous section will generally apply for the HPI, namely following the DQAF and the best practices for publication.

F.19.4.3. THE PRODUCER PRICE INDEX

The international standards of the PPI are similar to those presented above for the CPI namely with regards to the details to be published and the need for a release calendar. As most PPIs are quarterly indicators, they should be published 45 to 90 days after the reference period.

Taking a first look at the coverage and the relevance of the PPI immediately requires attention at the business survey cycle. Information on the methodology should be available not only for the PPI itself but also for the business survey. The business survey is the primary data source for weighting and sampling. A more detailed analysis inevitably examines the quality of the business survey. Mostly lower and lower-middle income partner countries have particular difficulties with these surveys.

In the case of the PPI the weights reference period, i.e., the year when the business survey data were collected, should not be older than 10 years.

A metadata document should also be available for the PPI, taking into account some differences namely the classification used for the basket of goods and services, i.e., CPC Ver. 2.1, or - the EU equivalent – the CPA, and the ISIC Rev. 4, or – the EU equivalent – NACE. Any geographic stratification, the number of surveyed companies per stratum and other methodological options should be explained in the metadata.

F.19.4.4 EXPORT AND IMPORT PRICES

Import and export unit value indices are calculated in some countries by using international trade value and volume data. Before calculating unit value indices, the basic data should be validated to eliminate outliers and errors. The methodology should be documented as described before for the CPI and the PPI.

F.19.4.5 GDP DEFLATOR

Price data are incorporated in national accounts if they are considered to be reliable. Therefore, the exclusion of any price data as a national accounts data source should prompt questions about reliability or, alternatively, coordination between the NA and CPI teams.

The price index most likely to be omitted from national accounts is the PPI, which many countries substitute with the CPI. In low-income countries with no investment goods industry, capital goods prices except for construction data can be drawn from import prices. The replacement of import and export prices by the CPI would lead to a considerable distortion.

F.19.4.6. PURCHASING POWER PARITIES

The quality of the data for PPPs is a function of how the ICP has been implemented in the country and region in question. The most effective way to collect PPP data is by integrating the process with the regular CPI exercise. Data quality will be higher with more frequent data collection, which should preferably be at least quarterly throughout the reference year. The products covered should represent most or all of the (4-digit COICOP) product groups. There should also be multiple goods or services measured in each of the product groups. A precise product or service specification is also an indicator that price measurement can be carried out effectively.

F.19.5. Improving sector statistics

The key challenges for lower- and middle-income economies' price indices programmes are related to the lack of human resources, technical skills and IT capacity. Human resources are often scarce and with a very high turnover. The impact of the risk of losing know-how when trained staff leaves the team can be mitigated by keeping documentation on methodology and procedures.

The lack of expertise to implement the best international practices and low capacity to setup and keep updated CPI software and databases can often be identified. This and the low level of human resources appointed to price statistics teams, can be the cause of less appropriate practices such as carrying forward missing prices instead of estimating them, using direct comparison instead of quality adjustments, lower product coverage, sampling made on expert judgement and price collection only in the main urban areas.

The fundamental challenge is keeping the indices updated which requires frequent household budget and business surveys. These essential surveys are very costly and the scarcity of financial resources for their implementation is a barrier to keeping price indices accurate.

Coordination among institutions and within the institution is often not a standard practice. The HBS and the national accounts teams need dialogue with the CPI team, and the same stands for the business survey and the PPI teams.

Box F.19.5: Example – Institutional cooperation between Somali Statistical Authorities and Statistics Sweden

The Directorate of National Statistics (DNS) of the Federal Government of Somalia (FGS), the Central Statistics Department (CSD) in Somaliland, the Puntland Statistics Department (PSD) and Statistics Sweden (SCB) have a bilateral cooperation project covering the production of CPI with improved quality. The following actions were part of the project:

1. Setting up a baseline for harmonization with international guidance and sustainable capacity development.

A mapping of current practises and key metadata was conducted alongside a price statistics fundamentals course. These two activities covered price statistics developmental aspects as described in the major price statistics manuals, i.e., design, construction, dissemination and maintenance.

1.1 Mapping of current practises and key metadata.

A mapping was produced comparing the CPI activities of all participating Somali authorities. The mapping provided an introduction to metadata principles and was utilised by the cooperation project to provide a baseline of strengths and opportunities upon which the statistical programme and capability development could be built.

1.2 Developing a learning culture - price statistics fundamentals course.

A fundamentals course in price statistics was provided by SCB as a learning and development opportunity in the style of a train-the-trainers approach. The modular course covered aspects including: Introduction to Prices; Constructing a Price Index; Price Collection and Aggregation; and Quality Change and Quality Adjustment Techniques. Somali authorities proceeded to build their own price collector and technical courses in consultation with each other and SCB. The training materials developed through this support programme are being used by the DNS to train staff in the other Federal statistical offices enabling regional CPI expansion.

2. Joint development of a production system adhering to international standards.

A production model was developed in consultation with SCB utilising readily available software solutions but mapped out in a way that enables future transition to more sophisticated platforms. SCB provided a high-touch approach in initial training, development and implementation progressing to low-touch and complete handover over a number of publication months. The model is tailored to the needs of each Somali authority and has been successfully rolled out to further regions:

- Jointly built to ensure knowledge development and local ownership of the production system
- Encompasses end-to-end Generic Statistical Business Process Model (GSBPM) production steps and includes: visual analysis; automated checks; logical drill-down capability for manual checks; and contemporary graph generation for publications. For GSBPM, please refer to section C.6.3.3.
- Includes imputation (automated and manual options) as well as quality adjustment capabilities

3. Production processes; calendars and publication documentation.

This activity was partially training and partially supporting key staff to develop practical strategy and documentation. This activity was designed to provide the Somali authorities with tools about how to work strategically and build processes, procedures and communication policy:

- Functioning yearly timeline for data to be transferred at the same time in the same way.
- A publication calendar and publication policy.
- Specified roles and responsibilities - who is doing what and when?
- Institutionalised knowledge through documentation.

The Consumer Price Index is now published monthly, with wider geographic coverage, updated weights, and methodology in-line with the recommended international practices.

Source: Strategy for Sweden's development cooperation with Somalia 2018–2022 | Openaid

To find out more…

Main manuals

- Consumer Price Index Manual: Concepts and Methods
- HICP Methodological Manual
- Technical manual on Owner-Occupied Housing and House Price Indices
- Handbook on Residential Property Prices Indices (RPPIs)
- Producer Price Index Manual: Theory and Practice
- Export and Import Price Index Manual: Theory and Practice
- Eurostat-OECD Methodological Manual on Purchasing Power Parities
- System of National Accounts 2008 - 2008 SNA

Global data sources

- IMF data home page
- Dissemination Standards Bulletin Board (DSBB) home page
- World Bank Databank - ICP 2017
- World Bank Databank - World Development Indicators

Selected regional national data sources

- IMF data home page
- Dissemination Standards Bulletin Board (DSBB) home page
- World Bank Databank - ICP 2017
- World Bank Databank - World Development Indicators

Classifications

- Classification of Individual Consumption According to Purpose (COICOP) 2018
- International Standard Industrial Classification of All Economic Activities (ISIC Rev.4)
- Statistical classification of economic activities (NACE Rev. 2.1)
- Central Product Classification (CPC Ver. 2.1)
- Classification of Products by Activity (CPA Ver. 2.1)

Main meetings

- Ottawa Group
- Group of Experts on Consumer Price Indices, online | UNECE

F.20 International trade statistics

F.20. International trade statistics

The chapter in brief

This chapter covers statistics on international trade in goods and services. Trade in goods, or merchandise, accounts for roughly 75% of international trade value and is addressed first. The discussion of each type of trade begins by describing the conceptual framework and continues by explaining data collection procedures and compilation methodology, concluding by discussing dissemination methods and quality analysis.

F.20.1. International merchandise trade statistics (IMTS)

The statistics covered in this section are defined by the UN's International Merchandise Trade Statistics: Concepts and Definitions 2010 (IMTS 2010).

In general, IMTS should record **all goods that are added to or subtracted from the stock of material resources of a country due to entering or leaving its economic territory**. In the exceptional cases where this guideline is not applicable or sufficient change of ownership should be used as a criterion – for example, in transactions relating to ships and aircraft, satellites and their launchers, power lines, pipelines and undersea communications cables, and some mobile equipment.

Specifically, transactions which should be included in or excluded from IMTS are listed in the IMTS Compilers' Manual, under Chapter 1, A. General Guidelines. Trade below customs reporting thresholds should be estimated and included if economically significant.

For customs data to be included in IMTS, the **recommended data elements** are:

- Trade flow: Export or import;
- Time of recording;
- Partner country: Country of origin for imports and final destination for exports;
- Country of consignment for imports;
- Trade value: on "Free on Board" basis for exports and "Cost, Insurance and Freight" basis for imports (emerging good practice recommends that "Free on Board" values be included for imports also if available);
- Currency unit;
- Commodity classification: Code describing type of goods (e.g., according to the World Customs Organisation's Harmonised System or the European Union's Combined Nomenclature);
- Quantity in kg;
- Supplementary quantity: Quantity in an additional unit (e.g., litres for liquids);
- Mode of transport: Land, water, air or other (e.g., pipeline); and
- Customs procedure code.

F.20.2. IMTS data sources and institutional arrangements

The UN IMTS Compilers' Manual discusses in detail the institutional framework for data sources and collection. IMTS data are primarily collected from customs administrations, who document imports and exports to support collection of duties. Statisticians take advantage of these administrative records. Therefore, production of good quality trade statistics depends to a great extent on effective coordination with the customs administration. Supplementary information to support full coverage may be obtained from additional sources, including shipping manifests, enterprise surveys, fiscal authorities, border surveys, aircraft and shipping registers, power companies, and parcel and postal services.

Strong **institutional arrangements** between National Statistical Offices (NSOs) and customs authorities provide the foundation for the compilation of high quality IMTS. These can take the form of national statistical laws, formal service-level agreements or memoranda of understanding, and clearly designate roles, rights and responsibilities of all agencies involved. Effective arrangements lead to the needs of all parties being taken into account, applicable international standards being followed, resources being used efficiently, proper quality assurance processes being developed and operated transparently, and high public confidence in data quality.

F.20.3. IMTS data compilation

The IMTS compilation process employs various ICT systems to handle the considerable amounts of data from collection to quality assurance. It is essential that compatibility is ensured and that systems are linked with specific sources of advice.

One widely used customs processing software system is ASYCUDA World, which was initiated and is supported by UNCTAD. It contains modules to:

- Check, store, register and amend declarations;
- Process declarations by applying validation rules and customs regulations;
- Select groups of declarations to inspect; and
- Store and update tariffs and information tables.

Eurotrace, developed by Eurostat, is a software package commonly used by NSOs for IMTS compilation. It is used across the world in around 90 countries, mainly in the ASEAN; Western Balkans; Western, Southern and Eastern Africa; and in the Caribbean. Eurotrace's functions are to:

- Import, validate and manage data, in particular customs data from ASYCUDA World or other systems;

- Process this data, both manually and automatically, by applying complex validation and credibility controls and ensuring international standards are met; and
- Define and load data to aggregated datasets ready for dissemination.

Functionality is also present for inputting non-customs data – NSOs should, where possible, use an integrated approach across all data sources. This requires cooperation from source agencies e.g., to utilise standard commodity codes or provide conversion information. NSOs should also cross-check data from complementary sources where possible.

F.20.4 IMTS metadata and quality

Two main types of metadata are associated with IMTS:

- Structural metadata – identifiers and descriptors such as units of measurement, time period, commodity code, country codes, trade flow etc.; and
- Reference metadata – referring to specific data, entire data collections or even the data source. In the context of IMTS, reference metadata include:
  - Concepts and definitions adopted and their practical implementation (e.g., coverage and valuation);
  - Methodologies used in generating the data (e.g., specification of data sources, description of the sampling framework in the context of survey-based data, description of data validation and editing techniques etc.); and
  - Quality dimensions such as relevance, accuracy, timeliness, methodological soundness, coherence and accessibility.

Quality assurance and data validation must be based on and derived from the conceptual framework adopted by a country. The IMTS 2010 provides an example of this in its Data Quality chapter, promoting a systematic approach where all aspects of the trade statistics programme are examined and evaluated against principles and standards in order to identify issues and take effective action to improve quality. This requires the adoption, application, and enforcement of a methodological framework.

Validation checks are commonly used for: Completeness; validity of codes; range checks of values; internal consistency; and aggregate consistency. Validity can be checked at data entry, and subsequently batch validation can be used – this involves the creation of error lists, generation of error statistics, flagging of conspicuous transactions, and classification of errors into certain versus possible. These checks are used to inform both automated and manual error correction at various stages:

- Data entry: The most important stage of quality assurance for IMTS is the completion of the customs declaration. Electronic data entry systems allow the implementation of comprehensive validation rules which can prevent certain categories of typing errors, entry of invalid or implausible codes, and entry of values outside a certain range, as well as invalid or implausible combinations of entries.
- At customs: Security, safety and the collection of revenue are the core functions of customs and can be viewed as their prime objectives in data quality assurance. Therefore, the information collected on imports is in many countries considered as being of higher quality than the data for exports, as customs duties usually apply only to imports. However, many customs offices now have statistical departments, supported by automated systems, that aim to ensure the quality of all statistical information and estimates for undocumented low-value transactions. Particular errors to be addressed at customs include incomplete shipping documents and poor identification of transiting goods.
- At the NSO: Here further validation checks are carried out, and the timeliness of the information provided to users is prioritized. A special focus is often given to the aggregated data and the final results are compared with those from previous periods. In addition, extra attention is given to transactions that are of particular importance, high value (e.g., transactions in ships and aircraft) or potentially outside the scope of IMTS (e.g., goods for repair). Often, benefit can be gained from access to the original records and accompanying information; therefore, quality assurance at the NSO also depends on data provision by and cooperation with customs.

F.20.5. IMTS dissemination

IMTS are published at national, regional and global levels. They can be released by NSOs, customs, central banks or occasionally by government ministries, but it is specifically recommended that one body only be responsible for the dissemination of national IMTS and release them according to a calendar published in advance. Regional organisations managing free trade areas or customs unions usually publish data on trade within the region as well as on the region's external trade with non-member countries. In the European Union, for example, the primary data source for IMTS is Eurostat.

Global organisations publish data on trade between all possible pairs of countries. Global trade databases are very large; for example, the United Nations Commodity Trade Statistics (COMTRADE) Database contains more than one billion trade records. In addition, commercial trade databases exist that seek to add value to the data. Furthermore, non-governmental databases (non-profit or commercial) can provide data that are not available from the government or regional organisations. COMTRADE disseminates detailed annual data for trade in goods according to the Harmonised System (HS; this standardised numerical system for classifying products is used around the world), and according to other classifications for the required indicators. In addition, the database provides the following indicators at commodity group level:

- Gross and seasonally adjusted trade value (in national currency or United States dollars);
- Unit value indices;

- Volume indices;
- Growth rates of trade values and indices;
- Share of a country in world trade;
- Main trading partners; and
- Balance of external trade.

Metadata on IMTS, including at country level, can also be obtained from COMTRADE.

A selection of links to global, regional and national trade databases is shown in the box 'To find out more' at the end of the chapter. The Eurostat database provides access to the EU's IMTS and metadata. Such databases provide data according to HS, Standard International Trade Classification (SITC) and sometimes Broad Economic Categories (BEC) classifications. Correspondence tables can be used to convert from one classification system to another or to update from an old version to the current version of a classification system. Correspondence tables are provided under the United Nations and Eurostat classifications links provided in the box 'To find out more' at the end of the chapter. For more information about the classifications, readers may also refer to chapter B.5.

F.20.6. Uses of IMTS data

The sustained interest in IMTS is due to their crucial role in studying economic development and in describing the global economic system binding producers and consumers located in different countries. In this context, the availability of timely and high-quality trade statistics becomes a precondition for in-depth analysis of production, consumption, employment, income, and overall welfare at both country and global levels.

Trade statistics are compiled to serve the needs of many users, including: Governments; the business community; compilers of other economic statistics, such as BOP and National Accounts; various regional, supranational and international organisations; researchers; and the general public. Different users need different data, ranging from data sets by country and commodity at varying levels of detail, to aggregated figures. The uses include:

- Development of national, regional, and international trade policy, including informing trade negotiations, aiding monitoring of trade agreements, and settling trade disputes. This is a major driving force for improving IMTS. Within the European Union IMTS are also used for multilateral and bilateral negotiations within the common commercial policy, for definition and implementation of the antidumping policy and for evaluating the progress of the Single Market.
- Short and medium-term monitoring informs economic policy in areas such as sustainable development, fiscal, monetary, structural and sectoral matters, as well as addressing issues relating to environmental and health concerns:
  - Trade volumes and price levels (Import and Export Price Indices) are used in National Accounts, and the contribution of net exports to growth is a key policy indicator; and
  - Monthly trade statistics are timely indicators of a country's economic activity (other such indicators include GDP and other National Accounts aggregates). For example, since increased economic activity usually results in an increase in imports, an observed change in imports from its trend rate of growth can be an early indicator that overall economic growth has deviated from its recent path.
- Market analysis to find and quantify foreign markets or supply opportunities for particular products;
- Determination of the economic characteristics of traders;
- Establishment of supply balances, particularly in areas such as agriculture and energy;
- Infrastructure planning (harbours, airports, roads etc.); and
- Compilation of other national statistics such as Transport Statistics, and use as an import component of various price indices (e.g., Cost of Living Indices).

In most countries, IMTS data are also the main data source for the compilation of the goods items of the Goods and Services Account of the BOP. There are however certain conceptual differences between the system of IMTS and the BOP which lead to adjustments that must be made for the compilation of the BOP. These adjustments are discussed in chapter 11 of the IMF's BPM6 Compilation Guide.

F.20.7. International trade in goods by enterprise characteristics

IMTS play a vital role in the assessment of every economy. Combined with additional information on characteristics of enterprises involved in international trade, such as the size and the sector of economic activity, trade data are significantly enhanced. Generally speaking, IMTS show movements of goods between countries by goods categories. However, they do not provide explicit information on the businesses which are behind these trade flows. In a globalised world where economies are increasingly interconnected, it is more and more important to know traders and their characteristics. Answering this question requires linking trade statistics with other sources, particularly business statistics (see chapter F.21), which describe the structure and evaluation of the activities of businesses.

Statistics on **international trade in goods by enterprise characteristics (TEC)** form a bridge between business statistics and IMTS. They aim at describing the structure of trade by characteristics of the trading enterprises, for instance by their economic activities, their size or concentration of trade.

These statistics provide a solid basis for policy analyses that explore the types of firms involved in international merchandise trade. They help answer questions such as:

- What kind of businesses are behind the trade flows of goods?

- What is the contribution of a particular activity sector to trade?
- What is the share of small and medium-sized enterprises to total trade?
- What is the share of enterprises that trade with a certain partner country and the amount of trade value they account for?

TEC statistics are based on two data sources: the IMTS data and data taken from business registers. Record linkage of IMTS data with business register records needs to be carried out so that each international trade transaction is connected with the characteristics of the involved firm. This enables the aggregation of the microdata by specific characteristics of firms (e.g., by sector of economic activity) to produce the statistics.

The accuracy of TEC statistics is primarily impacted by issues in the collection and compilation of detailed trade in goods statistics (e.g., reporting thresholds, non-response, delayed declarations, estimated trade value) as well as in the management of the statistical business registers (e.g., invalid ID number in the customs declaration -or trade register if it exists-, missing sector of economic activity in the Business Register etc.).

Issues may also occur in the linkage between the customs data and the statistical business register. Although the general principles on data linking are clear and straight-forward, there are several methodologically complex issues which need to be addressed more carefully, like business demographic changes, problematic linkages caused by complex business structures, missing or estimated data and non-registered traders.

The European Statistical System initiated the development of TEC statistics in 2005. A comprehensive guide on the compilation methods followed in it is provided by Eurostat's European business statistics compilers' manual for international trade in goods statistics - trade by enterprise characteristics. Eurostat is working together with the UNSD to draft methodological documentation for production of statistics on TEC worldwide. Statistics on TEC are disseminated by the OECD and by Eurostat.

Box F.20.1: Trade by Enterprise Characteristics

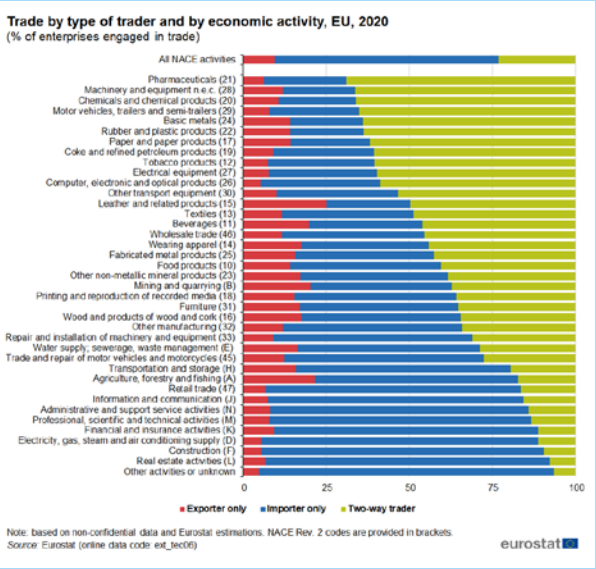
Trade statistics can be used in conjunction with business statistics to provide an enriched analysis of the characteristics of enterprises involved. Research on EU data for 2020 has shown, for instance, that two-way traders (those who both import and export) accounted for an overwhelming share of the EU's international trade value, but that two thirds of EU international traders were importers only. The chart below shows a breakdown of international trade value by type of trader and economic activity. It can be seen that the highest proportions of two-way traders were recorded for products of manufacturing industries known for their global production chains: Pharmaceuticals; Machinery and equipment; Chemicals and chemical products; and Motor vehicles.

Importers are of interest to policymakers as they facilitate access to goods otherwise not easily available, whereas exporters have the potential for job creation and economic growth resulting from expanding into new markets.

The prevalence of international trader types was also examined across EU Member States, revealing that the highest share of two-way traders was recorded in Lithuania (41%), while in Cyprus, Belgium and Ireland around 80% of traders were importers only. The highest share of exporters only was found in France (32%).

The study also revealed that a high proportion of international trade was concentrated in relatively few enterprises – for some of the smaller EU Member States, such as Luxembourg, Malta and Cyprus, almost all exports could be attributed to the top 1000 enterprises. By contrast, trade was more diluted in the larger Member States, with less than half of Italian exports attributable to the top 1000 enterprises, and the proportion being around two thirds in Germany, Poland and Spain. This may reflect a relatively high number of small and medium-sized enterprises (SMEs), or an increased propensity to international trade in goods.

The final aspect of analysis addressed the share of international trade by enterprise type of ownership, which is of considerable interest to policymakers when assessing the impact of globalisation. On average across 18 EU Member States domestically owned enterprises accounted for 58% of exports and 47% of imports. Variation was high between countries however, with domestically owned enterprises responsible for around 60% of the total exports in Germany and Spain, but only for 43% in Poland. The largest differences were observed in the sectors Motor vehicles and Electrical equipment.



F.20.8. IMTS quality analysis

Inconsistencies in IMTS can be identified using mirror statistics (e.g., comparing one country's export data to its partner's import data), or by noting discrepancies in time series, especially data changes from year to year that are difficult to explain. Data for sectors and/or trading partners where there is uncertainty about quality should be examined at increasing levels of detail. Visualising the main changes can help to identify problems such as time period recording errors, or those caused by confusion over goods' classification.

Quality information for IMTS can be found for most countries on COMTRADE. Eurostat too disseminates information on the quality of the IMTS of EU Member States among its metadata and dedicated quality reports. International data quality standards are set out in the UNSD's National Quality Assurance Frameworks Manual.

The quality issues most frequently associated with IMTS are gaps in coverage, asymmetries in partner information, unreliable quantity information and insufficient timeliness:

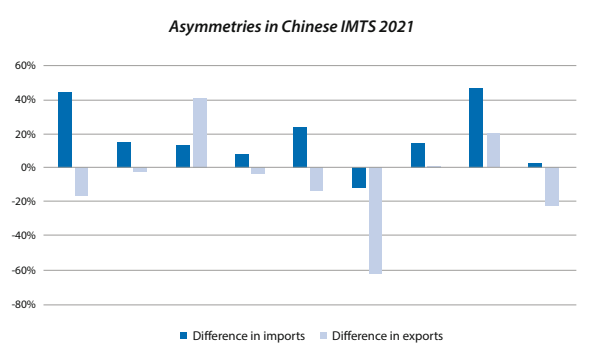
- **Coverage**: In many countries, transactions in certain commodities, such as oil, gas, electricity, raw materials, ships and aircraft, are not adequately captured by customs or by the NSO. In other countries, border or shuttle trade may be significant but not fully recorded. Lack of coverage can also arise in the case of the application of thresholds for simplification purposes at customs. Possible approaches to these issues entail use of additional data sources, appropriate estimation methods (particularly for below-threshold trade) and addressing them with the relevant governmental authorities. Coverage issues arising from any use of active confidentiality are beyond the scope of regular quality assurance at NSOs, although they can give rise to asymmetries (discussed below) or overall accuracy concerns.
- **Asymmetries in partner data**: Asymmetries can have multiple causes, including differences in the time of recording, the classification of commodities, partner-country attribution, trade system, confidentiality etc. Trading partner information in particular may be impossible to align owing to conceptual as well as practical factors, especially affecting global value and supply chain calculation.

The UN encourages countries to periodically conduct bilateral and multilateral reconciliation studies or implement data exchanges so that their statistics can be made more accurate and useful for both national purposes and for international comparisons (IMTS 2010 para. 9.18). Such studies should examine trade data covering at least three years and employ a systematic process of identifying and assessing the causes of disparities, including a thorough analysis of concepts and definitions used in data compilation. The short-term objective is to explain and assess the causes of differences in figures, obtaining mutually agreed datasets of higher quality through the alignment of data admissibility criteria. The longer-term objective is harmonisation of the conceptual frameworks, leading to the use of common compilation procedures and avoiding the recurrence of asymmetries.

Box F.20.2: Trade Statistics Asymmetry example

The chart below shows a mirror statistics analysis of imports to and exports from China in 2021. The partner countries selected are those with the greatest value of trade with China.

The darker bars represent the differences in the reporting of imports to China; values are positive if Chinese figures are higher than their trading partners' mirror data, and vice versa. The paler bars represent differences in export figures. Significant discrepancies can be seen in China's exports to Germany (62%), Japan (41%) and the Russian Federation (22%), and in China's imports from Australia (24%), Chinese Taipei (44%) and Malaysia (47%).



The above chart highlights the fact that there are significant IMTS reporting differences between China and its major trading partners; this illustrates that inter-country data comparability remains an important issue.

Source: The Trade Map online trade data repository and extraction tool provided by the International Trade Centre (Trade Map - Trade statistics for international business development)

The UN recommendation that country of consignment data be recorded for exports as well as imports (see IMTS 2010 para. 6.26) is intended to avoid transit countries being mistakenly listed as destinations, which is a cause of asymmetries.

- **Quantity information**: This is widely acknowledged as the weakest data element in IMTS core data. In some countries, the provision of quantity or net weight is not mandatory, or the information can be incomplete for other reasons or reported in non-standard units. There are several possible means of improving the quantity information: Providers of erroneous quantity values could be contacted; missing or dubious quantities could be replaced with estimates; additional data sources such as shipping documents could be consulted; or conversion factors could be employed to translate information into the desired units. A particular problem involves the need to avoid missing quantity values corrupting data aggregation; this must be carefully addressed in view of the multiple and growing uses of IMTS, including for health and environmental policymaking.
- **Timeliness**: Although the relevance of IMTS is greatly increased if they are provided in a timely manner, in many countries the information is provided much later than suggested. One means of improving the timeliness of information release is to review the data production process in light of existing best practice, and to publish preliminary data to be updated at a later date.

F.20.9. IMTS training and assistance

An online IMTS training programme is offered annually by the UN for data compilers and users. Box F.20.3 summarises the course contents.

Box F.20.3: UNCTAD course in International Merchandise Trade Statistics

This course provides comprehensive instruction videos, interactive webinars, and question-and-answer fora led by experts in the field. In 2022 it was attended by over a thousand participants from 154 countries. The course objectives are to:

- Enhance the ability to:
  - Apply the most recent recommendations on IMTS;
  - Define the best possible data sources;
  - Ensure adequate data collection systems; and
  - Optimise the statistics compilation processes.
- Value the importance of data quality, metadata, timely dissemination, and links to economic analysis and national policy objectives; and
- Master the use of internationally available guidance, especially IMTS 2010 and the related Compilers' Manual.

The primary target audience are trade data compilers; dependent on country practice these can be found in NSOs, Central Banks, Ministries of Trade or Customs Administrations. The secondary target audience consists of trade negotiators, statisticians, analysts or economists from:

- Ministries of Foreign Affairs, Agriculture, Transport, Energy etc.;
- Chambers of Commerce, Industry;
- NGOs; and
- Academic institutions.

The course contains the following modules:

1. Conceptual framework;
2. Institutional arrangements;
3. Production and compilation;
4. Metadata and quality;
5. Dissemination and analysis; and
6. New areas of work.

Additionally, international assistance, or 'interventions' can be offered to support NSOs with producing comparable, accurate, complete and timely data. These are generally undertaken as regional, as well as national, projects, as they can support regional integration and trade agreements. A regional economic community is therefore often designated as the focal point, responsible for compiling and publishing comparable regional trade statistics. This requires a statistical database and leads directly to online publication of other regional economic statistics, as has been demonstrated in, for example, ASEAN, CARICOM and COMESA in Asia, the Caribbean and Africa respectively.

Interventions must address all appropriate points in the chain of data collection and processing from customs declarations, or collection of survey data, to publication of statistics, strengthening coordination on:

- Data sharing (including the legal framework);
- Ensuring customs declaration forms take statistical needs into account;
- ICT systems;
- Supervision and training of customs officers; and
- Data analysis.

Possible implementation actions include the training of customs officers, as well as freight forwarders responsible for completing declarations.

Computer systems for data processing and compilation (a number of alternative systems being available for each), are an important part of IMTS interventions. The choice of system is often linked to the systems used by main trading partners. Technical assistance in installing and maintaining software can be provided, along with training in its use and on trade statistics in general.

Box F.20.4: Eurotrace configuration

Eurotrace has been installed and runs in many countries since 2004.

The software works with MS Access or MS SQL Server databases. For SQL Server, the recommended configuration must be used if the Server is installed locally, i.e., on the same computer/laptop.

Minimal Configuration (Access Version)

Processor: Pentium III (700Mhz)

RAM: 512MB

Hard-Drive: 500 MB + DB size

Windows: All versions starting Win NT4/XP to Win10/11

MS Office: All versions starting from Office 7.0

Recommended Configuration (SQL Server Version)

Processor: Multi-Core (2GHz or faster)

RAM: 4GB

Hard-Drive: 10GB

Windows: All flavours starting Win NT4/XP to Win10/11

MS Office: All flavours starting from Office 7.0

SQL Server: from SQL Server 2005/2008

General remarks (issues for attention):

- MS Access runs on a Single Core of the Processor (not internally multi-threaded for SQL calls). Therefore, if using the Access Version, it is more efficient to have a Processor with as few cores as possible (dual core is perfect: one for Windows, one for Eurotrace).
- SQL Server is multi-threaded and, therefore, multi-core is recommended.

For MS Office, a local installation is recommended. Compatibility with Office365 under Web interface (portal.office.com) is not guaranteed.

F.20.10. Statistics on international trade in services (SITS)

Services currently represent more than two thirds of global GDP according to the World Trade Organisation. They can be defined as activities that either change the condition of input units or facilitate the exchange of products or financial assets.

The statistics covered in this section are defined by the UN's Manual on Statistics of International Trade in Services 2010 (MSITS 2010), and follow the Extended Balance of Payments Services Classification 2010 (EBOPS 2010; see annex 1 of MSITS 2010). The key divisions of this are:

1. Manufacturing services on physical inputs owned by others;
2. Maintenance and repair services;
3. Transport;
4. Travel;
5. Construction;
6. Insurance and pension services;
7. Financial services;
8. Charges for the use of intellectual property;
9. Telecommunications, computer, and information services;
10. Other business services;
11. Personal, cultural, and recreational services; and
12. Government goods and services.

The World Trade Organization (WTO) General Agreement on Trade in Services (GATS) 1995 obliges all WTO members to report data transparently and not discriminate between trading partners. It recognises four modes of supply of commercial services:

- **Mode 1: Cross-border supply** – services flow from one country into another (e.g., banking or architectural services transmitted via telecommunications or mail);
- **Mode 2: Consumption abroad** – consumers (e.g., tourists or patients) move to another country to obtain services;
- **Mode 3: Commercial presence** (i.e., Foreign Affiliates) – suppliers establish a presence abroad (e.g., subsidiaries of insurance companies or hotel chains); and
- **Mode 4: Presence of natural persons** – residents of one country enter another to supply services (e.g., accountants, doctors or teachers).

Information on the international supply of services is provided by two different statistical frameworks:

1. The **Balance of Payments (BOP)** records transactions between residents and non-residents based on the centre of economic interest (residence) of an institutional unit. As such, it covers principally GATS modes 1, 2 and 4, via SITS.
2. The **Foreign Affiliates Statistics (FATS)** cover a number of indicators on the activity of controlled foreign affiliates, and thus provide information on the supply of services through GATS mode 3. FATS are discussed in section F.21.2.2.4.

Services Trade by Enterprise Characteristics (STEC)

These statistics provide information on the types of enterprises engaged in international trade in services and show how those in different industries supply services, and how this relates to their primary activity.

STEC data contribute to the larger statistical agenda on measuring economic globalisation and Global Value Chains (GVCs), and allow for better informed and tailored trade policies: By identifying the ownership status (foreign or domestic) of the enterprises involved in trade, the role of multinational enterprises in shaping globalisation, and the relationship between trade and investment, is explicitly addressed. Statistics on GVCs are discussed in detail in section F.21.2.2.4. STEC data provide an improved allocation of services exports and imports by the industry type of the trading enterprise; such data are needed for the development of the EU inter-country Supply, Use and Input-Output Tables (FIGARO project).

F.20.11. SITS data sources and quality

International trade in services statistics

The IMF's Balance of Payments and International Investment Position Manual (BPM6) provides guidance on the recording of cross-border transactions. Countries generally employ a mix of methods and data sources for SITS compilation, such as:

- **Enterprise surveys** of selected international transactors, either addressing all international transactions or specific services only;
- **Administrative records**;
- **Statistical models**;
- **Persons and households survey(s)**;
- **Customs revenue information**;
- **International Transactions Reporting System (ITRS)** – international payments channelled through domestic banks are reported with information on the types of services involved;
- **Partner country data** (mirror data);
- Data from **international organisations** providing aid or technical assistance;
- VAT **Mini One Stop Shop (MOSS)**, used for digital services;
- **VAT Information Exchange System** (VIES) data; and
- **Commercial** data sources.

Foreign Affiliate Trade Statistics

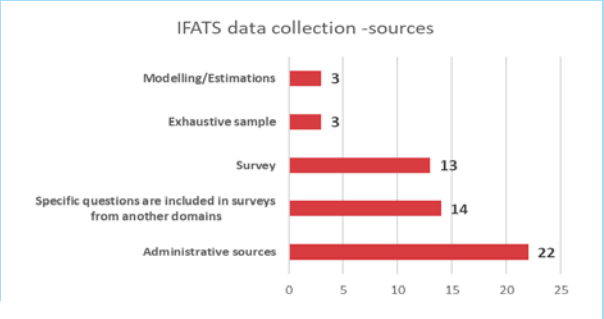
FATS data (see also section F.21.2.2.4) are gathered into two domains, which may require different approaches, according to the European business statistics compilers guide for European statistics on international supply of services by mode of supply:

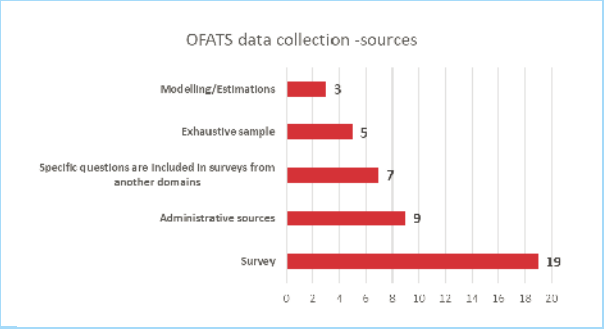
- Inward FATS (IFATS) – data collected mainly from administrative sources, followed by specific questions in surveys from other domains such as Foreign Direct Investment (FDI), Structural Business Statistics (SBS) and Research & Development statistics, an exhaustive annual survey of enterprises and administrative data sources (business registers and the European Groups Register).

- Outward FATS (OFATS) – data collected mainly via surveys, followed by administrative sources and via specific questions in surveys from other domains (such as Foreign Direct Investment statistics, Structural Business Statistics and an exhaustive annual survey of enterprises).

Box F.20.5: Data sources used for the compilation of IFATS and OFATS in the EU and in Norway, Switzerland and the USA

Countries take different approaches for FATS data collections. The figures that follow present some of the results of the questionnaire on "International supply of services by mode of supply – data availability in the FATS domain", which was run among IFATS and OFATS data compilers in the EU 27 member states and in Norway, Switzerland and the USA in April 2020.





F.20.12. SITS metadata

All data and methodological information should be readily accessible to provide transparency, particularly regarding deviations from recommended coverage and definitions. The IMF publishes all metadata from over 165 countries in a standardised format on its website for Enhanced General Data Dissemination System or Special Data Dissemination Standard as applicable; SITS metadata is included for those items included in BOP.

F.20.13. SITS dissemination and analysis

SITS are used for analytical and policy purposes, and in negotiations. They are commonly disseminated by regional and international organizations, which facilitates access to a wide range of data:

- Eurostat, the OECD, the IMF, UNCTAD and the UN currently disseminate BOP data by type of service for their respective member countries;
- The WTO estimates and publishes world and regional totals for the main commercial services items – total, transport, financial, computer and information services;
- Eurostat, the OECD and the UN provide data broken down geographically.

Dissemination of FATS is less advanced than BOP, but is gaining prominence at Eurostat, the OECD and UNCTAD, fuelled by growth in relevant national activity. The coverage of inward FATS is generally superior to outward, due to the difficulty of data collection for operations performed abroad. Where FATS data are unavailable, FDI statistics provide a useful indication. UNCTAD collates FDI data and conducts a direct survey of multinationals, publishing the combined results in its annual World Investment Report.

National SITS systems are unique combinations of collection and compilation processes, and the quality of results varies. Asymmetries in the SITS of trading partners are often monitored within specific economic zones or at a global level, as for IMTS. According to IMF data[1], in 2021 total global exports of services were higher than imports by US$472 billion (8% of gross service flows). In the case of more disaggregated figures (often more important in trade negotiations) similarly large discrepancies can also occur, such as the US$481 billion surplus for Commercial Services[2]. Contributing factors can include: misallocation, varying transaction thresholds or times of recording, or difficult geographical identification of counterparts.

1 World and Regional Tables: Balance of IMF: Payments and International Investment Position by Indicator (BPM6)
2 Trademap: trade in commercial services value and balance, by service

To find out more…

Global data sources

- United Nations Commodity Trade Statistics (COMTRADE) Database
- IMF Direction of Trade Statistics – database (requires subscription)

Selected regional and national data sources for trade statistics

Europe:

- Eurostat trade statistics - also a source of metadata

Africa:

- COMSTAT - statistical database for the COMESA region
- SADC Statistics Database
- ECOWAS Trade Statistics
- Senegal

Americas:

- CARICOM Regional Trade Information System
- ECLAC / CEPAL
- US Census Bureau

Asia:

- ASEAN
- China Ministry of Commerce
- IndiaStat
- Pakistan Federal Bureau of Statistics

Metadata and methodological documents

- United Nations trade publications page, which includes:
  - International Merchandise Trade Statistics: Concepts and Definitions – global recommendations for external trade statistics
  - IMTS Compilers' Manual
- National Quality Assurance Frameworks Manual
- IMF Balance of Payments and International Investment Position Manual (6th edition) – Chapter 10 presents the Goods and Services Account of BOP
- IMF Balance of Payments and International Investment Position Compilation Guide – Chapter 11 explains the use of IMTS data for compilation of the Goods and Services Account of BOP
- IMF Dissemination Standards Bulletin Board (DSBB) – Outlines national trade and payments methodology
- Eurostat's Focus on enterprise characteristics (TEC) webpage
- European business statistics compilers' manual for international trade in goods statistics - trade by enterprise characteristics
- European business statistics compilers guide for European statistics on international supply of services by mode of supply
- OECD's Trade by enterprise characteristics data

Classifications registries:

- Eurostat classifications
- UN Classifications on economic statistics

Software systems

- ASYCUDA (Automated SYstem for CUstoms DAta)
- ASYCUDA World
- Eurotrace

F.21 Business statistics

F.21. Business statistics

The chapter in brief

Business statistics concern the structure, economic activities, and performance of businesses. The scope can be even further detailed, covering other relevant information on businesses, such as their:

- demography;
- innovation activities, including research and development;
- usage of information and communication technologies (ICT), and e-commerce.

Essential statistical infrastructure such as statistical business registers is also considered part of the business statistics.

The increasing complexity of national and international business relations in the last decades pushed towards the establishment of a number of statistics capturing the globalisation of activities, such as:

- Foreign Direct Investment (FDI);
- Foreign Affiliates (FATS);
- Global Value Chains (GVC).

Business statistics provide users and key policymakers with much needed information for decision-making or for analytical purposes. In the meantime, they are a key input to the quarterly and the annual national accounts. They are also vital for analysing the value created and the employment in the different economic sectors, as well as the development of these sectors.

Business statistics are produced for different types of users and are based on data collected, either directly from the statistical units (e.g., enterprises) or from administrative sources (e.g., tax data). Two central sets of business statistics are the structural business statistics (SBS), used mainly for structural analysis, and short-term business statistics (STS), used mainly for trend analysis. These two sets of statistics are distinct but interrelated.

This chapter covers a wide area of statistics on economic activities but does not go into statistics for sectors such as transport (see chapter F.22) or agriculture, forestry and fishing (see chapter G.26), which are not part of business statistics. The chapter starts by identifying the main policy areas for which business statistics are used. It then provides a users' view of the statistics involved, including a description of the different kinds of business statistics. The chapter continues by identifying the main sources where the data can be found. Finally, the chapter discusses how to analyse the quality of the statistics and concludes with advice on and examples of how to improve national business statistics.

F.21.1. Policy applications: what these statistics are used for

Business statistics are in great demand for economic analysis by a large number of users: international organisations, aid donors, national governments and policymakers, central banks, financial markets and economic analysts, private sector companies, NGOs, media and the citizens of the country.

Business statistics may be used to answer such questions as

- how much wealth and how many jobs are created in a certain economic sector?
- in which specific sectors is this trend most notable?
- is a country relatively specialised in a given production?
- is a country an important consumer of a given material?
- what is the average wage of an employee within the energy production sector?
- how productive is the drink production sector?
- what is the impact of using new technologies?

Business statistics include many of the key short-term indicators that are vital for analysis of recent and current economic developments and the development of monetary and economic policy, both at national level and in the global context.

There are several business indicators allowing analyses of the economic performance in terms of productivity (how effectively economic inputs are converted into output) and profitability (how successful an enterprise is).

Business demography statistics, via demography of the enterprises, allow analysis of the active population of enterprises, their birth, survival and death. Special attention is paid to the impact of these demographic events on employment levels.

Business services (work that supports businesses but does not produce a tangible commodity, including IT, procurement, shipping, and finance) are a driver of the modern economy. Their labour-intensive nature has also attracted interest in their potential as providers of new jobs.

Recent developments of business statistics allow the follow up of factors providing new production possibilities and new modes of supply, providing information on innovation and research, as well as on development and uptake of information and communication technologies.

Statistical information on the globalisation is important in order to analyse correctly the potential for economic growth and employment creation, and to formulate policies.

F.21.2. Concepts and definitions

F.21.2.1. THE FRAMEWORK FOR BUSINESS STATISTICS

Business statistics describe the economy through the observation of units engaged in an economic activity. More precisely, business statistics refer to the structure, economic activities, and performance of the statistical units. The basic concepts are as follows:

Statistical units. The statistical units are the businesses, but businesses can be defined in different ways. The most common practice is to use the enterprise as the statistical unit. In general, when the data come from administrative sources, the reference is the **legal unit** (incorporated or unincorporated businesses, as well as registered sole proprietorships). Most enterprises consist of one legal unit.

The legal unit is an administrative unit and not a statistical unit. Often legal units and the enterprises they represent are linked by control relationships to other legal units and enterprises to form an enterprise group, controlled by one ultimate enterprise. This is particularly frequent with large economic actors (e.g., big corporations quoted at

the stock exchange) but not exclusively. Enterprise groups are numerous also among small and medium enterprises. Sometimes enterprises are split for statistical purposes in groups of offices, production facilities etc. contributing to the performance of a specific economic activity (Kind-of-activity unit, or KAU).

Many National Statistical Offices (NSOs) have adopted the **establishment** (also called local kind of activity unit) as a statistical unit. An establishment is generally a business or industrial unit at a single, physical location that produces or distributes goods or performs services (e.g., store, factory, farm etc.). An enterprise, on the other hand, may consist of establishments in more than one location performing the same or different types of economic activities.

A classification of economic activities is designed to categorise the statistical units. The international reference classification of economic activity is the UN's International Standard Industrial Classification of All Economic Activities (ISIC). ISIC is currently available in Revision 4.

Most countries use a national adaptation of ISIC based on Revision 4 or previous versions. ISIC presents a coherent and consistent classification structure of economic activities, based on internationally agreed concepts, definitions, principles, and classification rules. It establishes a comprehensive framework for collecting and reporting economic data, in a format designed for economic analysis, decision-taking and policymaking. Some regional variants of ISIC are also established, such as the EU's Statistical Classification of Economic Activities in the European Community (NACE) and the North American Industry Classification System (NAICS). More information about ISIC may be found in chapter B.5.

Economic activity. It can be defined as a process that, based on inputs, leads to the manufacture of a good or the provision of a service. Thus, an economic activity is characterised by an input of resources, a production process, and an output of products (goods or services).

Business registers. The availability of business registers is vital to the compilation of business statistics. Business registers are a key tool for the preparation and co-ordination of surveys, and for grossing up survey results. In many countries it is a legal obligation to incorporate a business activity, i.e., to enrol into an administrative register of operating companies. It is preferable having a statistical business register (SBR) established and maintained specifically for statistical purposes and allowing the use of the register to extract samples to survey. The SBR is generally obtained adjusting and optimising the administrative information.

There are countries where the NSO does not have access to administrative data, comprehensive administrative data do not exist, or the quality of the administrative data is not sufficient for the update of the SBR. In these countries the traditional economic censuses or other kinds of business surveys, as well as household surveys, are therefore an indispensable source for the SBR. Economic censuses deliver relevant and core information for the SBR on each single unit.

Even in countries that are able to use administrative data for their SBR, data from censuses may be used as a **complementary** source for checking or updating the SBR.

Many low- and middle-income countries face inadequacies in their statistical business registers such as the undercoverage of micro-businesses, the over-coverage of inactive businesses (which are not deleted when they stop their activity), and the inaccurate classification of businesses in terms of economic activity, size and/or location.

The Wiesbaden Group on Business Registers is an international expert group under the umbrella of the UN Statistical Commission. It is engaged in further development of business registers, survey frames and associated topics.

The European Statistical System has a leading role in the development of business registers and can serve as inspiration and basis.

The **core indicators** of business statistics are:

- **Outputs**: turnover, production value, value added
- **Inputs**: purchases of goods and services (incl. energy costs), personnel cost
- **Employment**: number of employees and other persons employed, number of worked hours
- **Investments**: gross investments in tangible goods.

The decision of whether business statistics should be prioritised over the development of other statistics critically depends on the situation of the country and on the state of the national statistical system (see chapter C.6.). The priorities should be clearly defined and set within the frame of the national development strategy and the National Strategy for the Development of Statistics (NSDS) or similar (see section C.7.1.).

F.21.2.2. THE MAIN TYPES OF BUSINESS STATISTICS

F.21.2.2.1. Structural (annual) business statistics (SBS)

Structural business statistics describe the structure, conduct and performance of economic activities, down to a detailed activity level.

Structural business statistics normally cover the 'business economy', which includes industry, construction, distributive trades, and services and exclude the financial and public sectors. Concerning households' activities, it is important to distinguish between profit and non-profit ones: only the profit activities are in principle part of the business economy. There are low- and middle-income countries where the households' profit activities (a relevant part of the informal economy) play a large role. Their measurement (also called 'formalisation') is difficult and implies relevant efforts.

The purpose of the structural business statistics is to analyse:

- The structure and evolution of enterprises' activities;
- Production factors and other elements influencing business activity, competitiveness and performance;

- The regional, national and international development of businesses and markets;
- Business conduct;
- Small and medium-sized enterprises;
- Specific characteristics of enterprises related to particular activities.

Main indicators of the Structural Business Statistics are: Number of enterprises, persons employed and employees; Turnover, production value, value added at factor cost and gross operating surplus; purchases of goods and services; change in stocks of goods and services; personnel costs; gross investments and sales of tangible investment goods.

Most of the Structural Business Statistics are broken-down by sector (industry, construction, trade and services), by region (according to the location of the enterprises; regional structural business statistics) and by size class (according to the number of the employed personnel, e.g., small and medium-sized enterprises (SMEs)). Structural business statistics are used as one of the key inputs for the compilation of production-related annual National Accounts.

Box F.21.1: Structural Business Statistics – EU practices

In the EU, a harmonised system of Structural Business Statistics (SBS) has been developed. The EU methodology for SBS is a valuable source of well-defined concepts and definitions, as well as of methodological approaches producing internationally harmonised quality business statistics.

The following table (extracted from the Eurostat database) provides an example of EU Structural Business Statistics. It shows the economic size of extractive industries in the EU countries in 2019 and allows evaluating their impact on the whole economy.

MINING AND QUARRYING	
COUNTRY	**2019**
Belgium	269.8
Bulgaria	652.9
Czechia	938.7
Denmark	2,434.4
Germany	3,717.4
Estonia	182.2
Ireland	470.1
Greece	301.6
Spain	1,400.8
France	1,335.7
Croatia	74.0
Italy	2,430.4
Cyprus	22.9
Latvia	112.6
Lithuania	100.9
Luxembourg	37.5
Hungary	327.4
Malta	9.1
Netherlands	4,857.3
Austria	918.1
Poland	7,550.6
Portugal	461.3
Romania	1,254.5
Slovenia	131.0
Slovakia	296.7
Finland	735.8
Sweden	2,031.6

F.21.2.2.2. Short-term business statistics (STS)

Short-term business statistics, or simply short-term statistics, abbreviated as STS, are a set of indicators, usually available with a higher than annual frequency (generally monthly or quarterly).

Short-term indicators allow the rapid assessment of the economic climate within an economy. In particular, STS are a key information source for formulating and monitoring the economic and monetary policy of a country and are in great demand by national governments and central banks, companies and financial markets.

Overall, the STS use is increasing, in particular after the 2008 financial crisis, and is widening to new areas of analysis and policymaking. As information flows have become global, the latest news release for an indicator may have fast and significant effects on markets and on decisions taken by central banks, policymakers and business leaders.

In general, STS indicators are published as indices which show the changes of the indicator in comparison with a fixed reference (base) year and in terms of growth rates, but not in absolute values.

Box F.21.2: Indices

An index measures trends in a time-series. In the case of short-term business statistics, the indices represent the movements of an indicator between a base year and the current period.
The index average is 100 for the base period; an index of 105 means that there has been a 5 % increase since the base period while an index of 97 means that there has been a 3 % decrease compared with the base period.

The STS indicators may be used as an input for compiling national accounts. The concepts and definitions used in STS are therefore closely linked to those used in the national accounts (see chapter F.17.).

STS indices generally cover four major sectors: **industry**, **construction**, **trade**, and **services**. These activities are defined in relation to the ISIC classification or a national/regional version of it (e.g., NACE in the EU). Main indicators covered by STS are, depending on the major sector: production and/or turnover; number of employees and self-employed persons; hours worked, and wages and salaries; producer prices, import prices; building permits; business registrations and bankruptcies.

F.21.2.2.3. Manufactured products statistics

The purpose of manufactured products statistics is to report, for each relevant product, how much has been produced during the reference period.

Manufactured products statistics generally cover the products from mining, quarrying and manufacturing activities. In some countries they also cover recycling products or the products of utilities.

Manufactured products statistics are normally annual, but may, for specific industries or products, be more frequent. Products are classified according to a standard classification, e.g., an international classification such as the Central Product Classification (CPC), the Harmonized System (HS) or the Standard International Trade Classification (SITC), or a national/regional adaptation of such international classifications. These classifications normally are either classifications for international trade (such as the CPC, HS and SITC) or have a close connection to these, so that production data can be combined with import and export data for analysis of product markets. Interested readers may refer to chapter B.5 for details.

Box F.21.3: Manufactured products statistics – EU practices

In the EU, statistics on the production of manufactured goods (PRODCOM) provide information on sold production, production under sub-contracted operations and actual production carried out by enterprises on the national territory of the EU Member States. PRODCOM statistics aim at providing a full picture at EU level of developments in industrial production for a given product or for an industry in a comparable manner across countries. This survey is based on a statistical classification containing about 4 000 different types of manufactured products (the PRODCOM list).
PRODCOM headings are coded using an eight-digit numerical code. The first six digits are identical to those of the Statistical Classification of Products by Activity (CPA) code. The PRODCOM list is therefore also fully consistent with the CPA, while further detailing the CPA product categories. The headings of the PRODCOM list are also linked to those from the Combined Nomenclature (CN) used to compile international trade in goods statistics, which thus enables direct comparisons between industrial production statistics and trade statistics.

F.21.2.2.4. Globalisation statistics

Foreign Direct Investment (FDI) encompasses all kind of cross-border investment made by an entity resident in one economy (direct investor) to acquire a lasting interest in an enterprise operating in another economy (direct investment enterprise).

FDI may be seen as an alternative economic strategy, adopted by those enterprises that invest to establish a new plant/office, or alternatively, purchase existing assets of a foreign enterprise. These enterprises seek to complement or substitute international trade by producing (and often selling) goods and services in countries other than where the enterprises were first established.

The methodological framework followed in the compilation of FDI statistics is that defined in the sixth edition of the International Monetary Fund Balance of Payments Manual (BPM6) and the OECD Benchmark Definition of Foreign Direct Investment Fourth Edition (BD4). It must be added that FDI is one of the five categories of the Financial Account of the Balance of Payments (see ch. 8 of BPM6).

Statistics on the structure and activity of foreign affiliates (FATS) are statistics about the operations of majority-owned foreign affiliates. FATS entities (majority owned only) represent a subset of the FDI population (all cross-border investment).

Foreign affiliates can have a large influence on the economy of a country. It is therefore of great interest to analyse the structure and ownership of such enterprises, as well as their activities within the country. A foreign affiliate is defined as an enterprise in a country which is under the control of an 'institutional unit' not resident in the country. The FATS data also facilitate monitoring the effectiveness of regional common markets and the integration of economies within the context of globalisation. Examples of FATS statistics and the methodologies applied can be found in the EU foreign controlled enterprises (FATS) statistics.

Statistics on Global Value Chains (GVC) are still at an experimental level and are not yet based on a consolidated methodology.

To stay competitive, enterprises increasingly organise their production globally in GVCs by breaking up their value chains into smaller parts supplied by a growing number of providers located worldwide. These GVCs comprise the full range of activities required to bring a product or service from conception through the different phases of production, delivery to final consumers and disposal after use.

GVC statistics can help measure organisational and spatial patterns in domestic, regional and global value chains, and monitor their effect on employment, wages, value-addition, innovation, skills, firm survival and turnover.

Statistics on International trade (see chapter F.20) are also relevant for the analysis of the globalisation impact on the economy.

F.21.2.2.5. Other business statistics

Business services statistics provide information on service providers, types of service purchased, the location of the main service provider, barriers to purchasing services and so forth, as well as information on service-related investments in intangibles (such as tradable rights, ICT, R&D, marketing and sales). Outsourcing, subcontracting and globalisation of the production have seen the demand for services increase. Enterprises use service providers both for non-core activities

(e.g., transport, marketing services) and for parts of their core activities to increase flexibility (e.g., labour recruitment services, international sourcing to low-cost countries). Other reasons include technological developments, which allow services to be delivered directly to customers anywhere in the world (e.g., streaming platforms, internet sales, call centres, helpdesks, software development, billing services etc.). These activities are very dynamic, and their labour-intensive nature has also attracted interest in their potential as providers of new jobs. EU business services statistics provide an example of how such statistics can be set up.

Statistics on 'Information and Communication Technologies' (ICT) are becoming more and more important as ICT account for a significant part of the productivity and growth.

Box F.21.4: ICT statistics – EU practices

In the EU the ICT statistics measure the uptake of EU technologies by enterprises and citizens and the digitalization of the EU economy and society. A variety of topics is covered, such as:

- use of internet,
- e-government,
- e-commerce,
- digital skills,
- Internet of Things (IoT),
- Use of Artificial Intelligence (AI)
- Data analytics,
- Cloud computing
- green ICT,
- employment of ICT specialists and
- ICT security

There are two annual surveys, one on the use of ICT in households and by individuals and one on ICT usage and e-commerce in enterprises, which are adapted annually to the technological developments.

Statistics on research and experimental development (R&D statistics) provide users with data about R&D expenditure and the personnel and researchers in R&D. R&D comprises creative and systematic work undertaken in order to increase the stock of knowledge - including knowledge of humankind, culture and society - and to devise new applications of available knowledge. The standard international reference on R&D statistics is the Frascati Manual.

Box F.21.5: R&D statistics – EU practices

In the EU, data is broken down by the following institutional sectors: business enterprise; government; higher education and private non-profit.

The data are collected through sample or census surveys, from administrative registers or through a combination of sources. In addition, this domain provides users with data concerning Government Budget Allocations for R&D (GBARD).

GBARD data are measuring government support to R&D activities, and thereby provide information about the priority governments give to different public R&D funding activities. GBARD data are broken down by socio-economic objectives in accordance with the Nomenclature for the analysis and comparison of scientific programmes and budgets (NABS).

Innovation statistics refer to innovation activities in businesses. These are the wide range of activities that business enterprises undertake in order to implement innovation processes, to develop new products and services, and to deliver them to the market. The standard international reference on R&D statistics is the Oslo Manual.

Box F.21.6: Innovation statistics – EU practices

EU member states implement the Community Innovation Survey (CIS) with coordination by Eurostat. The survey is designed to capture the information on different types of innovation, to enable analysis of innovation drivers or to assess the innovation outcomes.

The CIS focuses among others on the following aspects: innovation activities; innovation expenditure; innovative products (new to firm; new to the market); turnover from innovative products; business process innovation; incentives for implementation of innovation; innovation cooperation; sources of financing of innovation; sources of information on innovation; innovation barriers.

The CIS provides various innovation indicators by three main breakdown variables: type of innovator, economic activity and size class of enterprises.

The survey is implemented under European Commission legislation every two years. For each round, Eurostat together with the countries develops a standard core listing the mandatory and rotational questions to be provided within the round. The inventory of questions and concepts included in CIS questionnaires since 1992 can be viewed in a dedicated virtual tool, The CIS Questionnaire Library.

Statistics on high-tech industries and knowledge-intensive services are statistics about manufacturing and service industries which are considered of high technological or knowledge intensity.

Box F.21.7: European statistics on high-tech industries and knowledge-intensive services

Eurostat produces statistics comprising economic, employment and science, technology and innovation data obtained from various other domains and sources: innovation statistics, international trade statistics, human resources in science and technology statistics, labour force survey, patent statistics, R&D statistics, and structural business statistics.

The statistics are presented for aggregates of industries, products or patents defined as follows:

- Manufacturing industries are grouped into four aggregates according to technological intensity: high-technology, medium high-technology, medium low-technology, and low-technology industries. The criterion used is the ratio of R&D expenditure to value added of each industry at 2-digit level of NACE.
- Services are grouped into knowledge-intensive services (KIS) and less knowledge-intensive services (LKIS). The criterion used is the share of tertiary educated personnel of each industry at 2-digit level of NACE.
- A second grouping of industries, which mixes manufacturing and services together, is the group of Knowledge Intensive Activities (KIA). The criterion used is the share of tertiary educated personnel of each industry at 2-digit level of NACE. One subgroup is also defined: Knowledge Intensive Activities in Business Industries (KIABI).
- International trade statistics refer to particular groups of products, defined on the basis of SITC, characterised as high-tech products. The criterion used is the ratio of R&D expenditure over total sales.
- Patent statistics refer to two specific groups of patents, high-tech patents and biotechnology patents, aggregated on the basis of the International Patent Classification.

Business demography statistics present data on the active population of enterprises, their birth, survival, and death. Special attention is paid to the impact of these demographic events on employment levels. These data can be used to analyse the dynamics and innovation of different markets: for example, entrepreneurship in terms of the propensity to start a new business, or the contribution of newly born enterprises to the creation of jobs.

Box F.21.8: Business demography – EU practices

The EU Business demography incorporates also statistics on high-growth enterprises and young high-growth enterprises (in terms of employment), which give additional information about the entrepreneurship environment and the dynamism of enterprises.

F.21.3. Sources of data

F.21.3.1. COLLECTING AND COMPILING BUSINESS STATISTICS

The most common way of collecting data on businesses is for the NSO to carry out a (stratified) survey amongst registered enterprises. Samples for business surveys are drawn from a *sampling frame* such as a business register, ideally a statistical one (SBR).

Generally, NSOs make also some use of information originally collected for other (administrative) purposes.

Box F.21.9: Administrative sources for data on enterprises

Tax authorities: Quite detailed data on businesses are often held by the tax authorities and are normally a secure long-term source of business data. However, it will only cover registered businesses, and the definition of variables may differ from the ones required for statistics. There may also be quality issues, as some businesses may seek to minimise taxable income. Tax data provide NSOs with information for complementing survey information, for quality checking and for grossing up.

Line ministries and other administrations: Within the scope of their responsibilities, line ministries and other administrations often hold data on enterprises in specific sectors. The coverage, definition and reliability issues are similar to those of tax data. Data on publicly owned enterprises are often held by the responsible ministry or administration.

Business federations: These often hold information on their members. However, such information does not cover non-members, and sector federations only hold data on business in their own business sector.

Annual reports and public accounts of enterprises: Such accounts can be required by law or by stock exchange rules (for enterprises listed on the stock exchange). Such information is generally standardised (although simplified for small enterprises), and can be used to complement, verify, and aggregate survey information.

Credit information providers: These hold vast amounts of enterprise data drawn from public sources, quality assured and analysed. However, such data may be quite costly to acquire.

For business statistics, huge gains in efficiency and data quality can normally be realised through an extensive use of such administrative data, either as data source, as basis for estimations or as benchmark for validation. A close cooperation and coordination between the NSO and other administrations that collect enterprise data, in particular the tax authorities, is therefore highly recommended. The advantages and prerequisites of the different data collection modes and sources are discussed in detail in section B.2.2.1.

The annual Structural Business Statistics are mainly based on data obtained directly from the enterprises via statistical surveys, or data coming from administrative sources (e.g., taxation data (incl. VAT data), data from business registers etc.).

Basically, short-term business statistics should be derived from frequent and fast-to-execute business surveys. However, here too, administrative data such as VAT data (which are normally

collected with monthly, bi-monthly, or quarterly frequency) or other sources outside the national statistical systems can be used (e.g., cash register data or credit card data for trade), either as data source or basis for estimation, or for complementing or validating the survey data.

Many economic activities are influenced by regular variation due to seasonal fluctuations or social conventions (e.g., weather effects on construction). Infra-annual data (monthly or quarterly) should be adjusted to make them comparable from one period to another. A seasonally adjusted series is a time-series from which the effects of regular seasonal influences have been removed. In general, the seasonally adjusted series are smoother than the gross series and this further facilitates month-to-month comparisons. For some economic activities, the number of weekdays has a significant impact on the level of a series. For example, monthly activity in retail trade depends on the number of Saturdays during the reference month. Series are working day adjusted when the effects linked to the number of days of different types in the reference month are removed from the series.

Box F.21.10: Adjustments of STS indicators

Most STS indicators are adjusted for working days and/or seasonally adjusted. The seasonal adjustment methods recommended by the main international organisations are parametric methods based on signal extraction like Seats and semi-parametric methods based on a set of predefined moving averages like the Census II X 11 family and X13 ARIMA-SEATS.

JDemetra+ is an open-source software implementing the recommended methods.

The *Manufactured Products Statistics* are normally based on surveys of producing enterprises, requesting data on the physical volume of production and the value of production.

The main types of sources used for data on F*oreign Direct Investment* are direct surveys addressed to resident statistical units and reports by the central banking systems on international transactions.

A great variety of sources are used for Statistics on *the structure and activity of foreign affiliates* including business registers, annual reports of the companies, private databases, administrative sources, or other surveys. For the economic value generated by foreign-controlled enterprises resident in the compiling country (inward FATS), the most important source are the Structural Business Statistics (SBS), covering the same total enterprise population as inward FATS, where inward FATS adds the distinction between the two subpopulations of foreign-controlled and domestically controlled enterprises.

The statistics on Global Value Chains (GVC) are based on specific ad-hoc surveys among businesses, collecting information about international sourcing (e.g., relocation of jobs abroad) and GVC arrangements.

The *Business Services* data collection is based on a sample survey amongst registered enterprises; the survey can be part of the regular annual data collection of SBS.

Data on ICT are generally based on specific sample surveys.

The national business registers serve as the sources for the *Business Demography* data. Business registers, in principle, hold data on the creation and cessation of enterprises and their continuity as statistical units, their economic activity, their legal form, employment, turnover, and other information. No samples are drawn from the registers, but the full registers are processed.

Entrepreneurship indicators are calculated on the basis of the Business Demography collection.

F.21.3.2. INTERNATIONAL SOURCES FOR BUSINESS STATISTICS

In cooperation with the OECD, the statistics branch of the United Nations Industrial Development Organization (UNIDO) compiles detailed key industrial statistics with worldwide coverage. UNIDO's Statistics Unit also provides technical assistance to countries in strengthening their capacity for conducting industrial surveys, maintaining business registers and short-term statistical indicators, and carrying out data analysis of industrial performance.

UNIDO maintains the worldwide industrial statistical databases INDSTAT4, MINSTAT, IIP and IDSB and produces Statistical Country Briefs, all available on the UNIDO statistics data portal. The key statistical publication is the International Yearbook of Industrial Statistics. UNIDO strongly emphasises the quality of the statistics, in terms of international comparability, concepts and definitions, classification and coverage.

The INDSTAT4 database contains data by country, year and economic activity at the 3- and 4-digit levels of ISIC (Revisions 4 and 3) from 1990 onwards. The MINSTAT database is the equivalent of INDSTAT4 for mining activities and utilities activities (i.e., production and distribution of electricity, gas and water).

The IIP database contains the monthly and quarterly Index of Industrial Production at the 2-digit level of ISIC Revision 4, seasonally adjusted where appropriate.

The Industrial Demand-Supply Balance Database (IDSB) contains highly disaggregated data on the manufacturing sector. The data are arranged at the 4-digit level of ISIC Revision 3 and 4 pertaining to the manufacturing sector. The data come from output data reported by NSOs, together with UNIDO estimates for ISIC-based international trade from the UN Commodity Trade Database (COMTRADE).

The monthly data on the World Manufacturing Production are available on the UNIDO Statistics data portal.

The United Nations Statistics Division (UNSD) used to produce some relevant information, but from 2019 the responsibility on global industrial statistics was fully transferred to UNIDO. Historical data are still available in the UNSD databases.

Eurostat disseminate business statistics for the countries of the European Statistical System through its public database. Moreover, within the frame of the accession process, Eurostat has a close cooperation with the Candidate Countries and Potential Candidates. With the support of Eurostat and the European Statistical System (ESS), these countries are working to bring their business statistics systems in line with the acquis in this field and ESS standards. Through the European Neighbourhood Policy (ENP) Eurostat is also supporting and cooperating with the NSOs in the ENP-East and the ENP-South region in developing their statistical systems. Business statistics for Candidate Countries, Potential Candidates and for beneficiaries of the ENP are available on the Eurostat portal.

F.21.4. Analysing data quality and identifying problems

F.21.4.1. SPECIFIC QUALITY ISSUES FOR BUSINESS STATISTICS

Much of the discussion on the reliability of statistics focuses on issues of "data quality". Without going into too much detail, it is sufficient to say that it covers a number of dimensions, including accuracy, timeliness, relevance, accessibility and comparability (this is discussed in detail in section C.6.3.).

User relevance of business statistics

A central question concerning the quality of statistics is whether they are 'fit for purpose'. In other words, are the statistics meeting the information needs of users (and potential users)?

This can only be answered through consultations with users of the statistics concerned, be it through user surveys, direct consultations or permanent advisory groups of users. Key users of business statistics are national accountants, policymakers and administrators involved in economic development policies. As economic development is seen as one of the central pillars of overall development, e.g., in the fight against poverty, donors, international organisations and NGOs also have a keen interest. Furthermore, business statistics are a key information source for economic analysis, involving businesses themselves, financial analysts, researchers, media and interested citizens.

Timeliness and punctuality of dissemination

For business statistics in general and short-term statistics in particular, the issue of timeliness and punctuality of publishing statistics is of great importance. Short-term statistics are used to analyse the business cycle and current economic trends, and the publication of new statistics can have rapid and significant impact on markets. Users demand up-to-date figures published frequently and on time at pre-established dates. Such demand is being met by establishing a release calendar for the statistics.

A challenge in many countries is to set up and follow a release calendar for official statistics, both for business and other economic statistics and for other statistical areas. This is closely related with the issue of dissemination: it is not sufficient to have "good business statistics" stored somewhere inside the statistical office; they must be timely available in an appropriate form to all potential users. A good practice example is the Eurostat free dissemination database, which is the main repository of business statistics in Europe.

The importance of the statistical unit for business statistics

Statistics for a given characteristic have the greatest usefulness when they enable reliable comparisons across countries and over time. Both are sometimes limited by methodological differences between countries and changes in methodology from one year to another. A main issue on business statistics is related to the definition of statistical units, the variables and terminology. The recommended statistical unit is the enterprise; however, in some cases, data is collected and disseminated by establishment (also called local kind of activity unit) or local unit.

When data are made available to users, it should be clearly stated what the data refer to. The enterprise is a legal unit or the minimum combination of legal units that produces goods or services and that has autonomy with respect to financial and investment decision-making. It can be a corporation (or quasi-corporation), a non-profit institution, or an unincorporated enterprise. When an enterprise is considered equal to the legal unit this makes the enterprise easy to identify and handle across different registers and sources. However, the legal units may not correctly reflect the economic reality as they are affected by changes in economic circumstances and legislation (especially tax legislation) that can lead to split and/or mergers of legal units without any changes in the real production structure.

The problem of varying terminology

Terminology used in business accounting may vary greatly from one country to another. For example, while the word "turnover" means total sales in the UK and many European countries, for OECD "turnover" means the sum of gross sales plus some other incomes but excluding revenues from rental of real estate, contributions and gifts etc. In the Generally Accepted Accounting Principles (GAAP) of the United States, "turnover" is the number of times an asset is replaced during a financial period, often used in the context of inventory turnover or accounts receivable turnover. In securities, for either a portfolio or exchange, "turnover" is the number of shares traded for a period as a percentage of the total shares.

The effects of accounting rules

Business accounting principles may be the same in many countries, but actual accounting rules vary from one country to another. These rules affect the adjustment required for data collected from business accounts in order to use them for economic statistics. For example:

A. Some countries require accountants to expense expenditures on software while other countries allow capitalisation. In countries where capitalisation is not allowed, the expenses need to be imputed as output, which is then treated as gross capital formation.

B. In business accounting, net assets are mostly valued as the sum of the historical value of gross capital formation less depreciation (based on historical value). One cannot derive gross capital formation by deducting values of assets in two adjacent periods, as assets in business statistics should be valued at replacement costs.

A particular issue is the time period covered by business statistics versus the accounting periods. Annual business statistics generally follow the calendar year. However, some countries prescribe (or at least permit) accounting years different from the calendar year, e.g., from 1 May to 30 April of the following year. This causes problems for using tax and business accounts data as a basis for business statistics.

Box F.21.11: Example on solving inconsistency and missing data

The following example gives an indication how the inconsistency of data can be solved and the missing data can be estimated.

Inconsistency

We have data about the total Value Added Tax (VAT) for ISIC Rev. 4 class 4510 "Sale of motor vehicles" and data on turnover is available for a given period of time. Knowing the level of taxation for that specific type of retail trade we can compare it with the VAT to Turnover ratio and detect the possible inconsistency:

- The VAT value is 200 and the Turnover value is 2000: VAT/Turnover = 10%;
- However, the VAT level for this economic activity is 5%

In order to solve this inconsistency, the VAT and Turnover values should be checked using any supplementary information available, such as turnover data from public financial reports. As the example concerns motor vehicles, data from national vehicle registration authorities should also be used for checking and correcting the statistics.

In general, for any activity, the turnover per employee ratio can be used to analyse inconsistencies. Such ratios are constructed using information for similar businesses for which both variables are available and considered reliable. The average turnover per head ratios are then calculated by economic activity and size. Turnover per person ratios can also be used to estimate the missing variables.

Using different surveys and sources to improve the business statistics

In spite of all efforts to reduce the response burden on businesses, it is inevitable that some businesses will have to respond to more than one business survey. Especially the largest enterprises with an important impact on the national economy will be included in most business surveys. In addition, incorporated businesses are normally obliged to publish their key economic data. As long as it is possible to identify individual businesses, e.g. through specific identification numbers (VAT number, tax number), NSIs should utilise all available information on a business. By cross-checking surveys and other sources for validating data and impute missing values, significant gains in quality can be made. Some advanced NSIs have constructed integrated databases where all sources for data on businesses are directly available for cross-checking. However, gains in quality can be achieved by simply giving the staff responsible for a specific survey access to the paper questionnaires for the same business in other surveys and/or to the business' annual report.

F.21.4.2. THE INFORMAL ECONOMY

An important issue is the informal sector, which in some low- and middle-income countries can record a substantial share in the total economy and engage a large proportion of the workforce. Generally, the informal sector activities provide goods and services whose production and distribution are perfectly legal. In some countries, a large part of informal sector enterprises are actually registered in some way, or pay taxes, even though they may not be in a position to comply with the full range of legal and administrative requirements.

According to the 15th International Conference of Labour Statisticians (ICLS), informal sector enterprises are characterised by small size in terms of employment, non-registration of enterprises and non-registration of employees. Only enterprises without any of its employees registered should be counted to the informal sector.

The UN Expert Group on Informal Sector Statistics (Delhi Group) was active between 1997 and 2010. The Delhi Group recognised that there are limits to harmonisation; nevertheless, on the basis of the greatest common denominator, the Group was able to identify a subset of the informal sector that could be defined uniformly and for which countries could make internationally comparable data available.

In 2013 the International Labour Organisation (ILO) published the manual Measuring Informality, presenting the international standards as well as the international guidelines on employment in the informal sector, based on the collaboration with the Delhi Group in supporting national efforts to design and implement surveys on informal employment and the informal sector, and in disseminating and evaluating information about the lessons learned from the experience. This resulted in recommendations for improving the quality and comparability of informal sector and informal employment statistics.

Box F.21.12: How to collect information on the 'informal' economy

The best way to measure the informal sector critically depends on the aims of the measurement. The main methods used to obtain estimates of the magnitude can be separated into three classes:

1. **Direct methods** - Several approaches are used:
- to conduct a special survey on the informal sector;
- to expand the coverage of the existing regular surveys, such as labour force or household surveys, with information pertaining to the informal sector;
- to carry out mixed household–enterprise surveys.

2. **Indirect methods** - Can be sub-classified as follows:
- Discrepancy methods that rely on differences between aggregate income and expenditure or between labour force and formal employment capture the economic activity of the informal sector.
- Monetary methods are based on the assumption that hidden transactions use only cash; in this way, estimating the quantity of money in circulation and then taking away the incentives that induce agents into informality (usually taxes) should give a good approximation of the money used in informal activities.
- Physical input methods use discrepancies between electricity consumption and GDP.

3. **Model approaches** – They involve using structural equations to link unobserved variables to observed indicators. The use of models is not recommended for compiling national accounts.

The OECD handbook Measuring the Non-Observed Economy provides valuable guidance on how to collect information on the 'informal' economy, depending on what the information should be used for. If the aim simply is to monitor the informal sector employment in numbers as well as the characteristics and conditions of the work, the Handbook recommends to:

- *Add a few questions to the Labour Force Survey or similar household survey to identify informal sector work. (However, informal sector employment is often the second job of the interviewed person, e.g., farming for the own family's needs. The interviewers should follow up on such issues in the interviews.)*

If the aim is to collect detailed structural information (e.g., number and characteristics of enterprises, production, employment, income, capital etc.), a dedicated informal sector survey should be carried out.

The OECD Handbook recommends a mixed household-enterprise survey as the most suitable approach to collect comprehensive data about the informal sector. In a mixed household-enterprise survey, a sample of households is selected and each household is asked whether any of its members is an entrepreneur, i.e., the sole proprietor of, or a partner in, an unincorporated enterprise. Data for the enterprises identified (or for a sub-sample) are then collected. Such a survey might be an independent survey, a module attached to a household survey or an integrated survey. The design of the survey is multi-stage:
- Select a sample of geographical areas;
- List or interview all households in these sample areas and identify the owners of informal enterprises;
- Select the households with owners of informal sector enterprises;
- Carry out (the main) interviews of these households and enterprise owners.

An alternative to the mixed household-enterprise survey is an enterprise survey. However, this requires a 'sampling frame', i.e., a business register comprising also the informal enterprises or a recent census of the informal economic units.

Similar recommendations can be found in the ILO manual 'Measuring Informality: A Statistical Manual on the Informal Sector and Informal Employment', which provides practical guidance on implementing the international standards, by presenting alternative measurement methodologies along with examples based on national experience, and includes guidelines for the dissemination of statistics on the informal sector and informal employment.

F.21.5. Improving sector statistics

This section focuses on actions to improve the quality of business statistics, as well as on actions to reduce costs and the burden on respondents, the NSOs and other statistics producers. All new statistical requirements increase the burden on data providers (i.e., enterprises) and on the producers of statistics (NSOs). Given these pressures at national and international level, this must be tackled by each country and the most suitable solutions in the national context must be sought.

Use of administrative data

Businesses usually have an understanding of the reasons for supplying data for registration and taxation purposes, even if they do not like doing so. However, they often see statistical data requests as an extra, less necessary, burden. There is consensus that one of the best solutions is to use already existing data as far as possible, in particular administrative data. However, the information contained in administrative sources is not primarily collected for statistical purposes. Administrative data sources of special interest to business statistics include:

- Value Added Tax data;
- Business/Profit Taxation data;
- Register of Chamber of Commerce and National Business Registration Authorities;
- Central Bank records;
- Social Security data, etc.

The use of administrative data to produce statistics has both benefits and limitations. One of the main benefits is that data already exists and is (relatively) complete for the business population covered. The use of administrative sources also eliminates survey errors, removes (or significantly reduces) non-response, and provides more accurate and detailed estimates for various sub-populations.

Because the administrative data are collected according to administrative concepts and definitions, there are normally differences between these and the statistical concepts. Therefore, the issue of matching and calibrating data is very important and resource consuming. The classification systems used within administrative sources may be different to those used in the statistical world, and these sources may not cover the whole population of interest (e.g., enterprises exempt from VAT are not covered by the VAT data). For Short-Term Statistics, the administrative data may be available too late for producing fresh statistics.

To resolve such conflicts, it is necessary to establish priority rules, by deciding which source is most reliable for a particular variable. Once a priority order of sources has been determined for a variable, it should be possible to ensure that data from a high priority source are not overwritten by data from a lower priority source. This process is made much easier if source codes are stored alongside variables for which several sources are available.

Another important issue is the problem of missing data, which is not unique to administrative sources. It can also be due to full or partial non-response to statistical surveys, or even to the removal of data values during the editing process. However, with administrative sources, the issues can sometimes be different, particularly as the problem of missing data can often be more systematic.

Often, problems concerning incomplete coverage of the statistical population or missing information on certain issues can be addressed through mixed mode data collection. This means that the administrative data is used as far as possible, but that information which is not available in the administrative data is collected by a survey.

Small and medium-sized enterprises (SMEs)

SMEs are central to economic development and employment in most countries. Small enterprises are widespread in the informal economy, and these are not covered by surveys based on business registers. Even registered SMEs are commonly exempt from reporting obligations or report according to simplified rules and are often represented by only a minor proportion in stratified business surveys. Given the diverse and often incomplete and deficient state of SME statistics, careful analysis of the raw data is important before attempting to draw policy conclusions. SME statistics are a subset of business statistics for the whole economy and should not be seen in isolation.

Business registers

To identify the businesses to be included in a survey, a consistent and reliable **survey frame** is needed. This is normally a business register of some sort, ideally established or adapted for statistical purposes (SBR). In countries where such a well-maintained and updated statistical register is not yet available, one should in the short term make use of any business registers available and seek to combine and harmonise them as far as possible. In the longer term, a business register for statistical surveys should be established. In general, the quality of business statistics depends very much on the quality of the business register. Therefore, the sustainability of the register is extremely important. This means that proper maintenance and update procedures as well as the associated resources must be put in place. In many countries with a large informal sector, the business register, if it exists at all, contains enterprises accounting for only a relatively small proportion of total production. In such cases, introducing and strengthening the business register is a priority.

The informal economy

In many developing countries the 'informal sector' is of vital importance for employment and for the value created in the economy. However, the very nature of the informal economy makes it difficult to capture. The NSI needs to develop both a short term and a longer term strategy for capturing the activities of the 'informal' economy. This strategy should be integrated in the national statistical strategy. Box 11.5 presents best practices for collecting data on the informal economy. However, the approach should be adapted according to national priorities and the resources available.

Box F.21.13: Method for measuring the informal sector: 1-2-3 surveys

The 1-2-3 survey was first used in Mexico at the end of the 1980s. In the following years the method has been applied in many countries in Africa, Asia and Latin America.

1-2-3 surveys are 'modular mixed surveys', combining surveys on individuals, households and enterprises. This approach is considered as a robust and proven method for the measurement and data collection on the informal sector and on informal employment. It is flexible and can be adapted to national circumstances.

The method consists of three phases:

- **Phase 1 (Labour Force Survey)**: Survey collecting data on the economic activities of individuals and households concerning the supply of employment (employment / unemployment) and the integration of individuals into the job market and workplaces (working conditions). This survey provides information on the functioning of the labour market, especially on employment in the informal sector and on informal employment in the formal sector. The information collected is also used as a filter for the selection of the sample for phase 2.
- **Phase 2 (Survey of the Informal Sector; also called Informal Production Unit Survey)**: Survey on informal production units (IPU), from a supply-side perspective. The sample of production units is selected from households participating in Phase 1. The international standards reported in the ILO Manual leave some freedom on the choice of parameters to define the informal units. The most used parameters are the existence of an administrative identification number and of an official written accounting. The production units lacking the identification number and/or the official accounting are considered IPU. The survey is based on a stratified sample according to the sector of activity and status of the leader of the informal production unit. Principal economic and activity characteristics can be measured (e.g., value added, financing, sector and place of activity).
- **Phase 3 ("Mixed Survey")**: Basically, a household consumption survey to determine the level and structure of household consumption. The sample is taken as a subsample of households from Phase 1 and aims at results on consumption, formal / informal demand and poverty. Its originality lies in estimating the amounts of expenditure of the different categories of households by product, according to the place of purchase, and in particular their formal or informal origin. The consumption survey is combined with a survey on living conditions to quantify and analyse poverty. This survey provides information for the estimation of household income which are necessary for the estimation of the living standard and poverty levels of households.

The French DIAL Development Economics research centre has developed the KIT 1-2-3 software and documentation database solution for 1-2-3 surveys.

Box F.21.14: Example: Improving the statistics on the informal sector in Somalia

The survey of unregistered businesses was conducted in Somalia, between October and December 2019, simultaneously with the Somalia Enterprise Survey 2019. The survey covered two cities, Bosaso and Mogadishu, representing roughly 25% of the national population. It had between its main objectives to provide an estimate of the number of informal businesses operating in these cities.

A business that did not meet any of the following two conditions was considered as informal:

- Registration with the Ministry of Commerce
- Registration with the respective Municipality.

The survey used an innovative technique to survey informal businesses, with geographic area rather than an establishment or a business unit as a primary sampling unit. A sample of starting squares was selected. All informal business in selected squares were enumerated using a short questionnaire, containing basic information about the business. A randomly selected subset of the enumerated businesses was given a longer questionnaire, developed building on previous modules used by the Enterprise Analysis Unit of the World Bank to survey informal businesses.

If the number of informal units in a square exceeded a predefined threshold, all the squares surrounding the starting square were surveyed too, following the same approach. If one of the surrounding squares exceeded the threshold, then the squares surrounding that square were also surveyed. This process continued until either the network was exhausted, or a pre-defined cut-off point was reached.

The first step in the sampling approach was the construction of a spatial grid as the Primary Sampling Units (PSU) frame. The grid covered the total of municipal areas, and each cell had a size of 150 by 150 meters. This produced a total of about 3100 squares between the two cities, excluding squares that were considered inaccessible.

The second step was to stratify each grid, within each city, based on land use type. The grid's cells were categorized into five strata: residential, commercial/industrial, mixed (commercial and residential), market centres and open area. The stratification was based on local knowledge.

The third step in the sampling process was to select a pre-defined number of starting squares from each stratum for enumeration and main data. It is important to note that in Mogadishu, because of security challenges, data collection was conducted only in areas considered as safe (in November 2019) for the field team to conduct in person face-to-face interviews. Consequently, data for Mogadishu is representative only for these safe areas.

To estimate population parameters, weights (derived as the inverse of selection probability) were applied to survey samples. The survey data was collected using a standardized questionnaire, i.e., the long-form questionnaire.

The survey was fully implemented using computer-assisted personal interviewing (CAPI).

Box F.21.15: Example: Improving the Statistical Business Register (SBR) in Myanmar

A paper presented to the 27th meeting of the Wiesbaden Group on Business Registers in September 2021 stressed the lessons learned from the development of the SBR in Myanmar.

The Central Statistics Organization (CSO) of Myanmar identified the need for an SBR in 2015 after a business survey was conducted and all available survey frames were of such poor quality that the survey was prohibitively expensive.

In 2018, an attempt was made to individually request business licence data from the 330 local governments using an excel spreadsheet. Collecting the information took over a year and there were critical data quality issues, especially with missing data items regarding business size.

The lessons learnt from the initial data collection identified a possible solution. As part of the data cleaning / processing the CSO SBR got the opportunity to engage with many of the local governments directly. Often, after explaining the purpose of the data collection and how the data was being used, the local government officials submitted substantially improved data.

The focus was put on improving all stakeholders' understanding of the collection and of how the data was going to be used.

These measures were highly successful. The request for data on all businesses registered in the 2018-19 financial year was much more effective. The request was completed far quicker, needed far less cleaning and adjusting for all businesses registered.

- The SBR grew from 227,903 to 477,148 businesses.
- The number of records having a unique identifier passed from 86,708 to 159,042.
- The coverage of business licence status (new or continuing businesses) improved, passing from 24,772 to 231,658.
- Address data also improved: Myanmar outside of its capital city (Yangon) does not consistently utilise building or house numbers. Street names were nevertheless collected for 73.4% of businesses (the previous percentage was not quantified).

Timeline of development of the SBR in Myanmar

Timeline	Task
Dec 2015	CSO realise that a new survey frame source is needed.
Jul - Aug 2016	CSO engages with the three largest local governments in Myanmar to get access to their business license data.
Sep 2016 to Jul 2017	CSO requests the data from the three largest local governments and works with them to obtain the data in a useable format.
Jan to Oct 2018	CSO works through its regional offices to engage with other municipal governments and start collecting the data from all townships. CSO SBR team processes data and provides feedback
Oct 2018 to Apr 2019	CSO SBR team cleans and processes all the data including loading to CSO SBR system
May to Sep 2019	CSO SBR team starts to provide survey frames to internal and external survey operations.
Jan 2020	Data request for 2018-19 financial year launched
Mar 2020	Field data collection mostly finished
Aug 2020	Data mostly cleaned
Dec 2020	Draft report for 2020 SBR completed

To find out more…

Quality and methodology

- UN Statistics Division: The Development of an Integrated Approach to Business Statistics at United Nations Statistics Division
- UN Statistics Division: International Recommendations for Industrial Statistics 2008
- OECD Quality Measurement Framework
- Eurostat: Quality measures for economic indicators
- Eurostat: European business statistics manual – 2021 edition
- Eurostat: Methodological manual on European Structural Business Statistics – 2021 edition
- Eurostat: European business statistics compilers' manual for short-term business statistics — 2021 edition
- Eurostat-OECD Manual on Business Demography Statistics
- UN Statistics Division: Knowledgebase on Economic Statistics - Methods and Country Practices
- OECD: Completion of changes to the Main Economic Indicators paper
- UN Statistics Division: International Recommendations for the Index of Industrial Production 2010 (IRIIP 2010)
- UNSD: United Nations Guidelines on Statistical Business Registers
- Eurostat: European business statistics methodological manual for statistical business registers – 2021 edition
- IMF: Measuring the digital economy, 2018
- IMF: Balance of Payments and International Investment Position Manual (6th edition)
- Eurostat: Methodological Manual for the surveys on ICT usage in enterprises and households
- OECD: Frascati manual, 2015 edition
- OECD, Eurostat: Oslo manual, 2018 edition
- Eurostat: Community Innovation Survey Questionnaire Library.

Classifications

- UN Statistics Division's Classifications registry, including National classifications
- Eurostat statistical classifications

Business statistics and data sources

- United Nations Industrial Development Organization (UNIDO): Statistical databases
- UN Statistics Division: Industry Statistics (historical data)
- Eurostat's Structural Business Statistics (SBS), Short-Term Statistics (STS) and PRODCOM statistics on manufactured goods
- OECD: Industry statistics and Services statistics

The informal sector

- OECD: Measuring the Non-Observed Economy - A Handbook
- ILO: Measuring informality: A statistical manual on the informal sector and informal employment
- Eurostat: Essential SNA: Building the Basics – chapter VI 'The Informal Sector'
- The UN Expert Group on Informal Sector Statistics (Delhi Group)
- DIAL: KIT 1-2-3 (FR)

F.22 Transport statistics

F.22. Transport statistics

The chapter in brief

Transport infrastructure and networks play an important role in economic and social cohesion. Transport networks are important for trade and economic development by bringing goods and services to customers and by bringing passengers to work, schools etc. Transport is also a key dimension of external trade (see chapter F.20).

This chapter covers a wide area of transport statistics, such as infrastructure, equipment, enterprises, passenger and freight transport, accidents etc. It starts by identifying the main policy areas for which these statistics are used (see also section B.1.4.1 on the European Consensus on Development and section B.4.3 on the relationship between policy areas and statistics fields). The chapter provides an overview over the different transport statistics collected and information about the most important definitions and methods. The main sources of data are presented, followed by advice on how to analyse the quality of transport statistics. The chapter concludes with advice on how to build or to improve national transport statistics.

F.22.1. Policy applications: what these statistics are used for

Transport statistics have a wide variety of uses and allow monitoring of a wide range of areas:

- Transport plays a crucial role in the economy, bringing goods and services to customers: mobility of goods is necessary to facilitate trade and economic growth. The ability to move goods safely, quickly and cost-efficiently to markets is important for international trade, national distributive trades, and economic development. Strains on infrastructure, demonstrated by congestion and delays, as well as the constraints of disparate standards, technical barriers, poor interoperability and governance could all impact on economic development. All dimensions of sustainability - environmental, economic and social - are strongly impacted by transport activity.
- Transport is also necessary to take passengers to work or school (but also to shops or leisure activities). Within cities, transport infrastructure, norm setting, congestion and traffic management, public transport services, infrastructure charging, urban planning, safety and security have to be managed and improved. In addition, inter-urban passenger travel by rail, road or airplane, can also be strengthened by improvements to the infrastructure.
- Transport infrastructure and networks play an important role in economic and social cohesion, by linking island, landlocked and peripheral regions with more central regions, through interconnecting and interoperable national networks by land, air, sea and inland waterways. Better integration of national networks fosters regional cooperation and integration between neighbouring countries. From a regional perspective, an extensive network of roads, motorways and railway links is a prerequisite for economic development and interregional competitiveness.
- Growing mobility has an undesirable impact on safety, on congestion and on the environment. Thus, transport statistics are also needed to address the underlying issues and make it easier to model them. In particular, the transport sector is the fastest growing consumer of energy and producer of greenhouse gases.
- Improvements in safety and security in transport are very important questions and statistics are needed to monitor them.
- Multimodal freight transport policy supports the efficient 'door to door' movement of goods, using two or more modes of transport, in a highly integrated transport chain. Each mode of transport has its own advantages either in terms of potential capacity, levels of safety, flexibility, energy consumption, or environmental impact. As such, this multimodal transport allows each mode to play its role in building transport chains which overall are more efficient, cost effective and sustainable.

Box F.22.1: Sustainable Development Goals and transport; the Aichi 2030 Declaration for Asia

Transport features prominently in the Sustainable Development Goals (SDGs; see sections B.1.1. and B.4.1. for more information on them.) It is the direct objective of three specific targets, namely:

- SDG 3 – "Good health and well-being", Target 3.6: By 2020, halve the number of global deaths and injuries from road traffic accidents.
- SDG 9 – "Industry, innovation and infrastructure", Target 9.1: Develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all.
- SDG 11 – "Sustainable cities and communities", Target 11.2: By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons.

These targets are translated into four SDG indicators. Sustainable transport is one of the key sustainable development topics and as such it is mainstreamed into additional SDGs and particularly those on food, energy and economic growth.
Regional sustainable development strategies and initiatives also list transport among their priorities and objectives or are entirely focused on it. A recent case is the Aichi 2030 Declaration on Environmentally Sustainable Transport - Making Transport in Asia Sustainable (2021-2030). It was signed by 21 Asian countries on 20 October 2021 as a non-legal, non-binding agreement which is open to all Asia-Pacific countries to join voluntarily. The Declaration sets the following goals:

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- Goal 1a – Low-Carbon (climate change mitigation): By 2030, aim to peak transport CO_2 emissions and initiate reductions in transport related CO_2 emissions with the intention to move towards decarbonization of the transport sector by 2050, or shortly thereafter.
- Goal 1b – Resilience: By 2030, increase resilience and adaptive capacity of transport system to climate-related hazards and pandemics such as COVID-19.
- Goal 1c – Air pollution: By 2030, reduce air pollution and contamination caused by traffic, including PM2.5, other air pollutants and noise.
- Goal 2 – Road safety: By 2030, halve the number of deaths and injuries from road traffic accidents in Asia compared to 2020, with specific attention to vulnerable road users.
- Goal 3 – Economic sustainability: By 2030, realize sustainable economic and employment growth by leveraging science, technology and innovation and green investments in quality passenger and freight transport infrastructure and services in a manner that fully incorporates environmental and social impacts throughout the lifecycle of the transport infrastructure and services.
- Goal 4 – Rural access: By 2030, realize accessible, inclusive, safe, affordable, and resilient rural transport infrastructure and services, thus facilitating improved access to markets, basic utilities and services including health and education by the farming community, and other rural population including physically disabled and vulnerable groups.
- Goal 5 – Urban access: By 2030, ensure access to accessible, inclusive, safe, efficient, affordable, and sustainable transport facilities, systems and services for urban dwellers, including physically disabled and vulnerable groups through the development of urban transport infrastructure and services.
- Goal 6 – National access and connectivity: By 2030, facilitate inclusive multi-modal national (including rural-urban) and regional (cross-border) connectivity through the provision of sustainable multi-modal freight and passenger transport infrastructure and services.

F.22.2. Concepts and definitions

The new UNECE Classification of International Statistics Activities, which was introduced in section B.4.3, defines in its section 2.6 transport statistics as the statistics

- on all modes of transport, i.e., air, rail, road, inland waterways, sea, oil and gas pipelines
- including topics like transport infrastructure, equipment, traffic flows, personal mobility, safety, energy consumption, transport enterprises, passengers and freight transport, transport sector trends, and
- excluding transport for tourism, international transport and the cost of transport services.

It is not however, necessary that a national producer of statistics precisely applies this delineation of the domain. It is quite common to also cover employment in transport enterprises, costs of investment in and maintenance of infrastructure and equipment, and pollutants emitted by transport activities. Furthermore, at least maritime freight transport statistics are almost certain to cover international transport.

Numerous statistical indicators need be compiled to give a complete overview of transport activity in a country. The main ones are:

- Infrastructure: length of railway lines operated, length of motorways and other roads, length of navigable inland waterways, length of pipelines operated;
- Equipment: number of locomotives, railcars and wagons, tractive power of locomotives and railcars, number of passenger seats and berths, carrying capacity of wagons, number of road vehicles (motorcycles, passenger cars, motor coaches and buses, lorries and road tractors), load capacity of lorries, semi-trailers and trailers, new registrations of road vehicles during the year, number of self-propelled vessels, tugs, pushers, and dumb and pushed vessels, total power of self-propelled vessels, tugs and pushers, total carrying capacity of self-propelled vessels, number of aircraft, total number of passenger aircraft seats.
- Transport enterprises and employment: number of enterprises, number of persons employed by transport enterprises; except for maritime transport, for which these indicators are not common.
- Passenger transport: number of passengers transported, number of passenger flights performed, number of passenger-kilometres performed, number of vehicle-kilometres performed.
- Freight transport: number of tonnes of goods transported, number of cargo flights performed, number of twenty-foot equivalent units transported, number of tonne-kilometres performed, number of vehicle-kilometres performed.
- Expenditure: expenditure on new infrastructure and equipment, expenditure for the maintenance of existing infrastructure and equipment.
- Safety: number of accidents, number of persons killed, number of persons injured, number of suicides (usually measured separately from deaths due to accident).

The statistics expressed in numbers of passengers and tonnes of goods transported are sometimes called statistics on 'transport measurement'. The statistics expressed in passenger-kilometres and tonne-kilometres are sometimes called statistics on 'transport performance'; transport performance statistics can also include transport figures expressed as ratios over total population, GDP etc. Statistics expressed in vehicle-kilometres are sometimes called statistics on 'traffic'.

The **twenty-foot equivalent unit (TEU)** is a measurement unit used for the standardisation of measurements of goods transported in containers. As containers come in several dimensions, they are converted with specific conversion factors into equivalents of the 20 foot long (6.10 m) ISO container. The latter represents one TEU.

Multimodal transport and **intermodal transport** are two concepts that can cause confusion. Multimodal transport means the transport of goods by at least two different modes of transport. **Intermodal transport is a particular type of multimodal transport**: it is the transport of goods in the same **intermodal transport unit** (e.g., a container) without the goods being handled when changing modes.

A multilingual glossary of transport statistics is maintained and developed by Eurostat in collaboration with the United Nations Economic Commission for Europe (UNECE) and the International Transport Forum (ITF), in order to promote common definitions and concepts for transport statistics. This glossary provides reference definitions for transport statistics for all modes and meets the need to harmonise transport statistics at the international level.

Several classifications are needed for transport statistics. Most of them are quite short (e.g., type of passenger in maritime transport statistics, type of accident etc.). Some larger classifications are also needed. In particular, the NST 2007 (Nomenclature uniforme des marchandises pour les statistiques des transports) is a commodity classification used to describe the goods transported by rail, road, inland waterways and sea. As it has been developed in Europe, it is strongly interrelated with the European Classification of Products by Activity (CPA) and, as a consequence, consistent with the Central Product Classification (CPC). The place of loading/unloading of the goods or the place of embarkation/disembarkation of passengers plays also an important role. This coding should be done according to the lists of administrative regions of each country. Member States of the European Union, for instance, use the Nomenclature of Territorial Units for Statistics (NUTS).

F.22.3. Sources of data

Transport statistics are obtained from various sources.

Information related to infrastructure and transport equipment is available from administrative sources (road administrators, vehicle registers etc.).

Data on enterprises are obtained from business statistics and data on employment from the labour force survey but can also be collected through surveys of the relevant enterprises.

Box F.22.2: Transport enterprise statistics of Colombia

The National Administrative Department of Statistics of Colombia (DANE; its acronym in Spanish) implements two transport enterprise surveys. The first, 'Basic Survey of Freight Transport Enterprises', covers freight transport, while the second, 'Basic Survey of Intermunicipal Passenger Transport Enterprises', covers intercity passenger transport.

The surveys collect information on revenues, expenses (including personnel wages) and employment. Besides used to produce statistics on the enterprises and employment the data are used for the production of two indices: The monthly Freight Transportation Cost Index and the quarterly Intermunicipal Passenger Transportation Cost Index.

Data on traffic, transport measurement and transport performance are obtained through specific data collections that need to be implemented by responsible national authorities. The data providers that usually have the source information per mode of transport are the following:

- Road freight transport: road transport enterprises.
- Rail transport: railway undertakings.
- Air: airport authorities.
- Sea: maritime port authorities.
- Inland waterways: inland waterways port authorities.

Box F.22.3: Passenger and freight transport statistics of Vietnam

The General Statistics Office of Vietnam publishes annual statistics on four transport indicators:

- Number of passengers carried
- Passenger traffic: passenger transport expressed in passenger-kilometres
- Volume of freight: the total weight of freight transported (including packing)
- Volume of freight traffic: the volume of transported freight expressed in tonne-kilometres

The indicators are available with several breakdowns. More specifically, the passenger transport indicators are broken down by:

- Type of transport, i.e., mode of transport: rail, road, inland waterways and air
- Transport sector (only for air transport): domestic, overseas
- Type of ownership: state, non-state, foreign
- Province

Freight transport indicators are broken down by:

- Type of transport, i.e., mode of transport: as above plus maritime
- Transport sector: as above
- Type of ownership: state, non-state, foreign direct investment
- Province

One more indicator is disseminated:

- Volume of freight transported by inland waterways, sea or air, broken down by mode of transport and (separately) into goods for export, goods for import, goods in transit and domestic goods.

Box F.22.4: Surveys of road freight transport

Statistics on road freight transport are obtained via sample surveys (in space and in time) collecting information from transport enterprises. As the number of enterprises in most countries is very large, sample surveys are carried out to collect information from a representative selection (sample) of this population. In this way, the desired attributes of the population of road freight transport enterprises can be estimated to a known precision according to standard statistical theory.

EU Member States, for instance, carry out quarterly sample surveys and record the road goods transport undertaken by vehicles registered in their country. Thus, each country reports all activities of a road motor vehicle inside and outside its national territory. Data are collected with questionnaires sent out by the statistical authorities to the sample of enterprises. The data concern the vehicles, their journeys and the goods that were transported. Publication 'Methodologies used in road freight transport surveys in Member States, EFTA and Candidate Countries, 2021 edition' provides information about the road freight transport surveys undertaken in these countries.

This box presents guidelines for the implementation of such surveys.

Sampling register used for the survey

Register: Register of road vehicles if available. Otherwise, such a register needs to be created.

Organisation maintaining the register: Ministry of Transport, Ministry of Interior, Road administration etc.

Frequency of access to draw the samples: The statistical authority needs to have an agreement with the organisation maintaining the register for its access. Access is needed at least once a quarter.

Arrangements for accessing the register: A replication of the statistical version of the register of road vehicles can be made for the statistical authority at least each quarter, in compliance with the agreement between the statistical authority and the organisation maintaining the register. Before each quarterly sampling, the register of motor vehicles can be matched with the Business Register to obtain information on activity and address for owners and users of vehicles – if this information is not available in the road vehicles register.

Information obtained from the registers:

Register of Motor Vehicles: identifier of the owner/user, type of ownership, registration number, type of vehicle, body type, load capacity, maximum permissible laden weight, number of axles, date of first registration, date of first registration in the country, type of fuel used etc.

Business Register: Main activity of the operator, name of the owner/user, address of the owner/user.

Sampling methodology

Statistical unit: Goods road transport vehicle; transport enterprise.

Special types of units can be excluded: Agricultural, military and public service vehicles and special purposes vehicles. Vehicles with load capacity or maximum permissible laden weight below a specific threshold might be excluded from the survey. The threshold depends on the country and is such that vehicles below it represent a high proportion of vehicles, but a very small share of tonnes carried. Therefore, excluding them from the survey reduces survey costs without losing much information.

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Time unit: at least half a week; one week is recommended.

Stratification: Many variables can be used to stratify the sample. The most efficient ones are: Load capacity; region; type of transport (own account or hire or reward); type of body; year of first registration or age of vehicle; type of ownership; type of licence; etc.

Calculation of weighting factors:

In the cases of a survey carried out over one week and for all 13 weeks of a quarter, the weighting factor is 13*(N/S), where

N = Number of vehicles in the register (in a stratum)

S = Number of questionnaires used in analysis

Quality aspects

Several indicators are used to measure the quality of road freight surveys: register quality; non-response rate, standard error. These indicators allow to identify the weaknesses of the survey and thus to take actions for the improvement of their quality.

Specifically for road passenger transport, several data sources usually need to be combined: household surveys, dedicated passenger mobility surveys, censuses of road traffic (traffic counts), mobile phone data (especially for urban traffic), odometer readings, data on fuel consumption by passenger cars, buses and coaches.

Regarding the dissemination of transport statistics, various international organisations publish transport statistics for their member countries.

The International Transport Forum (ITF), an intergovernmental organisation within the OECD, publishes annual reports on transport statistics and provides free access to its database on transport statistics. Key indicators are available for 53 countries on: freight transport by rail, road, inland waterways, short-sea shipping, and oil and gas pipelines; passenger transport by rail and road; road accidents; infrastructure investments and maintenance.

The International Road Federation (IRF) publishes the annual 'World Road Statistics'. As of 2022 the relevant data are freely available. This dataset includes road and transport statistics for more than 185zexpenditures. In addition, it covers production, imports, first registrations and exports of motor vehicles as well as energy in connection with road traffic.

The International Union of Railways (UIC) hosts the RAIL Information System and Analyses (RAILISA), is an online tool allowing users to view and download rail statistics about all regions of the world at national level. The statistics are based on data provided by railway companies. The indicators available cover: length of lines and tracks on the infrastructure network, passenger and freight transport, train movements, rolling stock, staff numbers, financial results, etc.

Box F.22.5: Sources for African transport data

Sub-Saharan Africa Transport Policy Program

The Sub-Saharan Africa Transport Policy Program (SSATP) is a partnership of African countries, regional economic communities, African institutions, national and regional organizations as well as international development partners. These partners are all dedicated to ensuring that transport plays its full part in achieving poverty reduction, pro-poor growth, and regional integration in Africa.

The group of member countries is continuously expanding. At the time of writing this guide (December 2022) the SSATP covers 42 countries, some of them, despite its name, from north of the Sahara.

One serious obstacle to the development of effective policy is the lack of reliable and accurate data on the transport sector. To address it, SSATP launched in 2004 the development of a common set of transport indicators. That initiative helped countries build capacity in data collation, analysis and management in order to improve monitoring of the sector. Based on these experiences, but also on the Africa Infrastructure Country Diagnostic and the Africa Infrastructure Knowledge Program that will be presented below, SSATP developed guidelines for the establishment of efficient and sustainable Transport Sector Data Management Systems (TSDMS).

SSATP current work and priorities are described in the SSATP Fourth Development Plan.

Africa Infrastructure Country Diagnostic

The Africa Infrastructure Country Diagnostic (AICD) project expanded the knowledge of the physical infrastructure in Africa. It provided a baseline against which future improvements in infrastructures could be measured, making it possible to monitor the results achieved from donor support. It also provided a better empirical foundation for prioritizing investments and designing policy reforms in Africa's infrastructure sectors.

AICD collected detailed economic and technical data on infrastructure in 24 African countries. The project produced a series of reports on public expenditure, spending needs, and sector performance in each of the main infrastructure sectors: energy, information and communication technologies, irrigation, transport, and water and sanitation. The main findings were summarised in the AICD flagship report Africa's Infrastructure—A Time for Transformation, published by the World Bank in November 2009; the transport sectors (transport; roads; railways; ports and shipping; airports and air transport) are summarised in chapters 9 to 13.

Africa Infrastructure Knowledge Program

The AICD had been conceived as a one-off study. Its Steering Committee recognized in July 2008 the importance of continuing to collect data on infrastructure in Africa. Consequently, it recommended to extend the diagnostic to all African countries and to transfer the project to the African Development Bank. The ultimate aim was to produce and maintain a repository of infrastructure data and ensure a sustainable collection of infrastructure indicators in the future.

The Africa Infrastructure Knowledge Program (AIKP) has been the result of this effort. It disseminates statistics on five key topics among which are air, rail and seaports. The Bank intends to guide the regular collection and assessment of indicators, the enhancement of the original AICD database, the production of knowledge products, and the policy analysis of emerging infrastructure trends.

Box F.22.6: Asian Transport Outlook

The Asian Development Bank has launched, since 2021, the Asian Transport Outlook. This resource publishes statistics and policy information related to transport in Asia and the Pacific.

More specifically, this knowledge base disseminates:

- National statistics on transport for 51 economies, comprising approximately 400 indicators.
- Documents on the institutional frameworks, policies, and financing of transport in these economies.
- Analytical reports based on the compiled data.

An urban database covering 460 cities and comprising 101 urban indicators will be made available online in 2023. Until then, it is available as a downloadable Excel file.

The United Nations Economic Commission for Europe (UNECE) disseminates transport statistics for its member states. Several indicators are available for the following domains: road traffic accidents; road traffic; road vehicle fleet; railway traffic accidents; railway traffic; railway vehicles; inland waterways traffic; inland waterways vessels; oil pipeline transport; transport infrastructure.

Eurostat publishes EU Member State, candidate country and EFTA country transport statistics for rail, road, inland waterways, oil pipeline, maritime and air in its free dissemination database. For each of these domains, an exhaustive list of indicators is published: infrastructure; equipment; enterprises, economic performance and employment; traffic; transport measurement for goods and passengers; accidents.

Statistical authorities publish also on their website transport data for their country. For example, the Bureau of Transportation Statistics (BTS) provides very complete information on transport in the United States. Boxes F.22.2 and F.22.3 presented transport statistics from Colombia and Vietnam.

F.22.4. Analysing data quality and identifying problems

The quality of transport statistics depends on the data coverage, the harmonisation of the definitions and methodologies across the countries of a given region or sub-region, as well as their compliance with international recommendations and classifications. For example, in the EU, the adoption of legal acts for the provision of transport statistics was an important factor for the improvement of data quality in terms of data availability and comparability across the EU.

One way to identify problems is to look at asymmetries in transport reported by two reporting units (e.g., multi-country regions or sub-regions, individual countries, ports, airports, sub-national territorial units etc.), one being the place of loading of the goods or embarkation of passengers and the other one the place of unloading of the same goods or disembarkation of the same passengers. This is in particular

the case for maritime and air transport statistics where data for incoming and outgoing transport are available for each port / airport with the information of the origin and destination port / airport respectively. Thus, a country's transport statistics can be examined through 'mirror' checking, which aims to identify the main discrepancies between the two sets of data and the reasons for their existence, and to propose measures to reduce or eliminate these problems. The reader is reminded that a similar case for mirror checking emerges in international trade statistics (see section F.20.8).

The short-term objective of mirror checks is to explain and assess the causes of discrepancies in transport statistics and hence to obtain datasets of better quality. Longer term objectives may include harmonising the conceptual framework of two sets of statistics, which could lead to the use of new procedures in data compilation.

Box F.22.7: Example of mirror checks for air transport statistics

In theory, the number of passengers arriving in a country's airports is equal to the number of passengers leaving the airports of the countries of origin. The airports of origin will also include airports located in the same country as the airports of destination, which is the case of domestic or national transport. The same applies for the number of passengers leaving a country's airports.

In practice, there are often discrepancies between the two supposedly equal figures. Mirror checks are a systematic method of identifying problems in air transport data reported by a country. They can be applied to check the statistics produced by any country or multi-national region/sub-region.

Mirror checking is run both for national and international transport at airport level.

For example, Eurostat applies mirror checking as follows.

Passenger transport by air

The following formula is used for the calculation of the mirror deviation for a given airport-to-airport route (for example transport between airport A and airport B):

$$MD = \frac{\left| P_A(B \rightarrow A) + P_A(A \rightarrow B) - P_B(B \rightarrow A) - P_B(A \rightarrow B) \right|}{\left(\frac{P_A(B \rightarrow A) + P_A(A \rightarrow B) + P_B(B \rightarrow A) + P_B(A \rightarrow B)}{2} \right)} \times 100$$

where

$P_A(B \rightarrow A)$ is the number of passengers reported by airport A as arriving to it from B

$P_A(A \rightarrow B)$ is the number of passengers reported by airport A as leaving it for B

$P_B(B \rightarrow A)$ is the number of passengers reported by airport B as leaving it for A

$P_B(A \rightarrow B)$ is the number of passengers reported by airport B as arriving to it from A

i.e., in theory, $P_A(B \rightarrow A)$ should be equal to $P_B(B \rightarrow A)$ and $P_A(A \rightarrow B)$ should be equal to $P_B(A \rightarrow B)$.

The threshold over which the value of MD is considered as indication of a problem depends on the size of the flow between the airports, i.e., on the number of passengers that travel between the two airports and on whether the data refer to national or international travel. The thresholds applied by Eurostat are the following.

National transport of passengers

Data range	Threshold
>= 2000 passengers < 5000 passengers	100%
>= 5000 passengers < 35000 passengers	10%
>= 35000 passengers < 160000 passengers	2.5%
>= 160000 passengers	1.5%

International transport of passengers

Data range	Threshold
>= 2000 passengers < 5000 passengers	100%
>= 5000 passengers < 15000 passengers	40%
>= 15000 passengers < 65000 passengers	15%
>= 65000 passengers	5%

Freight transport by air

The following formula is used for the calculation of the mirror deviation for the route connecting airport A and airport B:

$$MD = \frac{\left| T_A(B \rightarrow A) - T_B(B \rightarrow A) \right|}{\left(\frac{T_A(B \rightarrow A) + T_B(B \rightarrow A)}{2} \right)} \times 100$$

where

$T_A(B \rightarrow A)$ is the total weight of goods reported by airport A as arriving to it from B

$T_B(B \rightarrow A)$ is the total weight of goods reported by airport B as leaving it for A

i.e., in theory, $T_A(B \rightarrow A)$ should be equal to $T_B(B \rightarrow A)$.

The threshold over which the value of MD is considered as indication of a problem depends, again, on the size of the flow between the airports and on whether the data refer to national or international travel. The thresholds applied by Eurostat are the following.

National freight transport

Data range	Threshold
>= 200 Tonnes < 800 Tonnes	50%
>= 800 Tonnes < 2000 Tonnes	25%
>= 2000 Tonnes	20%

International freight transport

Data range	Threshold
>= 500 Tonnes < 1300 Tonnes	150%
>= 1300 Tonnes < 6500 Tonnes	75%
>= 6500 Tonnes	50%

This information, as well a lot of additional information about European air transport statistics are available in the Reference Manual on Air Transport Statistics, 2023 edition.

Time series analysis consists in the comparison of data collected over different time periods. If the comparison leads to significant variations between the time periods considered, the data under consideration could be considered as suspicious. Usually, the analysis of variation of yearly or quarterly data for consecutive years allows detecting the main problems in the transport data studied.

In the case of quarterly data, different types of analysis can be envisaged, for example checking:

- The change of yearly data for two consecutive years;
- The change of quarterly data (same quarter) for two consecutive years, for example Q1 2021 with Q1 2020;
- The variation of quarterly data over the four quarters of a year.

In order to implement a time series analysis, it is necessary to determine the threshold above which the observed change or variation in the compared data should be considered suspicious. Usual statistical methods can be used for the calculation of thresholds to be applied. The absolute change between two time periods (|(V2-V1)| / V1) is then calculated and values above the threshold are considered as suspicious.

F.22.5. Improving sector statistics

Statistical authorities collect transport statistics from various sources. Thus, it is very important to establish good collaboration with data providers in order to obtain source data with good quality. This is typically the case for sea and air transport, where a good cooperation with airports and port authorities is necessary to get data from.

A formal service-level agreement or memorandum of understanding between the organisations involved is often necessary to align the interests of the two services. It could also be useful to organise workshops with the data providers in order to explain the statistical needs and the data to be provided. These meetings can be used to define an action plan, set up timetables and prepare recommendations on methodologies to be implemented.

Some of the transport data are obtained from administrative sources; in these cases too, it is very important for the producer of the statistics to have a good cooperation or agreement with these institutions.

Employment data are obtained from labour force surveys; in this case it is necessary to have contacts with the persons responsible for the surveys' questionnaire in order to ensure that the questions will allow derivation of the data needed for transport statistics. This is also the case for the collection of data on passenger mobility that might require adding specific questions to the labour force surveys questionnaire.

For the creation of a new data collection, the following actions might be necessary: identification of sources; institutional building and development of methodology to compile the statistics to be produced.

Box F.22.8: Example of terms of reference of a project that compiled road traffic statistics

Detailed description of the action

In order to collect comparable and relevant road traffic statistics in vehicle-kilometres (Vkm) the following tasks were planned to be conducted in the framework of this project:

- Documentary work related to the data collection methods utilised by other countries in the region: data sources, frequency and methods of estimation and evaluation of the results.
- Identification of data sources for road traffic variables.
- Identification of appropriate statistical instruments in order to compile Vkm variables, according to the recommended methods, e.g., household surveys, odometer readings, fuel consumption etc. and definition of calculation methods.
- Design of statistical survey.
- Co-operation with the National Road company for compiling statistical data using traffic counts.
- Co-operation with administrative sources, e.g., ministries for compiling data on vehicles' fleet.
- Appropriate activities for corroborating statistical data collected from administrative sources, traffic counts and different statistical surveys in order to estimate trends and evaluate results.

Results of the action

- Assessed and developed process for the collection of variables on road traffic statistics.
- Appropriate data sources identified and mobilised for the production of Vkm indicators.
- Cooperation with national organisations for development of actual data sources and procedures of compiling road traffic statistics.
- Statistical data collected and disseminated in national publications.
- Statistical data provided to international organisations, according to the recommended methodology.

It is also very important that the producer of statistics implements basic credibility and consistency checks during the collection and preparation of transport statistics. This is a vital factor in the improvement of quality of transport statistics.

First, basic validation checks need to be implemented. They are used to check the format of a dataset, the codes of coded variables, that values are in the applicable range etc. Such checks are very useful to detect basic errors in the data, in particular coding mistakes and can be integrated in countries' IT systems used for data production.

Then consistency checks have to be implemented in order to check:

- Totals for breakdowns in each table (validation of data within a dataset).
- Coherence between different datasets: for example, data on the same variable and for the same population group appearing in different tables should have the same value.
- Plausibility of values: for example, distances need to be positive; weight of goods should be consistent with the load capacity of the vehicle that carried them etc.

Credibility and consistency checks allow detecting errors in the calculation procedures and help in assessing the coherence of data.

To find out more…

Data sources

- International Transport Forum (ITF) - Statistics database
- International Road Federation (IRF) - World Road Statistics
- International Union of Railways (UIC) - RAIL Information System and Analyses (RAILISA)
- Asian Transport Outlook
- Asian Transport Outlook Urban Database. Downloadable Excel file. In 2023, it will be replaced by a node in the Asian Transport Outlook.
- Sub-Saharan Africa Transport Policy Program (SSATP)
- Africa Infrastructure Knowledge Program (AIKP)
- Africa Infrastructure Country Diagnostic (AICD) database
- United Nations Economic Commission for Europe (UNECE) - Transport statistics
- Eurostat's free data browser – Transport statistics
- National Administrative Department of Statistics of Colombia (DANE)
- General Statistical Office of Vietnam - Trade and services statistics, including transport
- US Bureau of Transportation Statistics (BTS)

Metadata

- Glossary of transport statistics, 5th edition, 2019, Eurostat
- International Transport Forum
- Sustainable transport. Description of the key topic in the UN's SDG website.
- Eurostat website – transport page
- Methodologies used in road freight transport surveys in Member States, EFTA and Candidate Countries, 2021 edition
- Reference Manual on Air Transport Statistics, 2023 edition, Eurostat
- Eurostat, Publications and Methodology manuals on transport statistics

Classifications

- NST 2007
- CPC

Other links

- Aichi 2030 Declaration on Environmentally Sustainable Transport - Making Transport in Asia Sustainable (2021-2030)
- Sub-Saharan Africa Transport Policy Program (SSATP) Fourth Development Plan

F.23 Income and consumption statistics

F.23. Income and consumption statistics

The chapter in brief

Quality of life is determined by more than just economic factors. Economic well-being, nevertheless, is a major factor and the focus of attention of governments, researchers, civil society and the general public. Statistics on household income and consumption provide important information about economic well-being and its variation across geographical areas, population groups and points in time. Poverty, discussed in chapter E.12, is a key topic but not the only one studied with the help of income and consumption statistics.

This chapter covers income and consumption statistics, with an emphasis on the statistics produced on the basis of microdata at the household and person level. It discusses, however, their relationship with household income and consumption statistics produced in the national accounts context. It starts by identifying the main policy areas and the statistical products for which these statistics are used. The chapter provides an overview of the most important concepts that apply in these statistics. The main sources of data and ways to collect them are presented, followed by a discussion of main quality considerations when producing the statistics. The chapter concludes with advice on how to improve income and consumption statistics, especially towards the direction of obtaining microdata on the joint distribution of income and consumption.

F.23.1. Policy applications: what income and consumption statistics are used for

Quality of life is a broad concept that encompasses several different dimensions (by which we understand the elements or factors making up a complete entity). It encompasses both objective factors (e.g., command of material resources, health, work status, living conditions and many others) and the subjective perception one has of them. Material living conditions are one such dimension and comprise three components: income, consumption and wealth.

When referring to income and consumption statistics in this chapter, we refer to statistics about income and consumption of **households and persons**. These statistics provide information on the **economic well-being** of households and persons.

One view of income and consumption is the **macroeconomic view**, which considers the total income and the total consumption of all households of a geographical entity over the reference period. This is the view taken in National Accounts (NA), which recognise the household sector as one of the sectors of the economy (see chapter F.17). NA, in essence, describe the income and consumption of the average household.

The other view is the **microeconomic view**. It examines how income and consumption vary between individuals and households, i.e., how much income is held and how much is spent by higher-income groups, how much by lower-income groups etc. In brief, this view examines **income and consumption distribution**. This is the view of income and consumption statistics computed on the basis of microdata about households and persons, which are collected with household surveys or from other sources (see section F.23.3).

Income and consumption statistics find several **uses in policymaking and in the study of society**:

- Assess the level of the economic well-being of households and individuals, the way it varies between different socio-economic groups, and the way it has evolved over time.
- Design, implement and monitor economic and social policy.
- Identify socio-economic groups in need of financial support and other targeted actions.
- Assess the impact of universal or targeted actions on the economic well-being of households and individuals.
- Study poverty, and design, implement and monitor policies to alleviate it. Poverty statistics are discussed in detail in chapter E.12.
- Study consumer behaviour and the functioning of retail markets; design, implement and monitor consumer protection policies.
- Study what income and consumption distribution show about the way societies are organised, especially about the nature and extent of inequalities.
- Study the relationship between the social and economic characteristics of households and individuals and their income and consumption patterns.

Eurostat collects and publishes over 300 indicators based on its flagship European statistics on income, social inclusion and living conditions (EU-SILC) for EU and candidate countries. The indicators are widely used to monitor EU-policies, in particular the EU 2030 target on poverty and social exclusion, while they are also used in the European pillar of Social Rights and the monitoring of Sustainable Development Goals (SDG).

Income and consumption provide complementary, partly overlapping views into economic well-being. Income allows households and individuals to consume and satisfy their needs; however, they may choose to save a large part of it and, consequently, not satisfy all their present needs. On the other hand, households with low income may be able to draw on savings or to liquidate property (i.e., 'wealth') and maintain their consumption at levels that provide for a comfortable life.

It has been recognised that statistics on the joint distribution of income, consumption and wealth help describe even more thoroughly the economic well-being and vulnerability of households and individuals. They also help understand better the dynamics of economic inequalities. As a consequence, they will help in the design of better policies against inequalities. More information on joint income, consumption and wealth distributions can be found in section F.23.5.

Income and consumption statistics based on microdata find also **use in the production of other statistics**:

- Consumption microdata are used to specify the basket of goods and services and the weights of goods and services categories used for the compilation of price indices (see chapter F.19), NA, and other statistics. These purposes are served in the EU by the Household Budget Survey (HBS).
- Income and consumption microdata are used in NA to produce distributional accounts for the household sector, i.e., statistics on economic aggregates (income, consumption, savings etc.) for household groups consistent with NA methodology. In short, NA ensure comprehensiveness, coherence and international comparability but cannot provide information on the distribution of economic resources and uses among people. For their part, microdata allow calculating distribution indicators but do not fully cover all people's economic resources and may give incoherent estimates on interlinked phenomena when data come from independent data sources. Distributional accounts combine the advantages of both approaches. The joint Eurostat-OECD manual Distributional national account estimates for household income and consumption: methodological issues and experimental results presents the results of a recent relevant exercise. The Income and consumption: social surveys and national accounts web site presents relevant experimental statistics.

It must be stated that this chapter discusses mainly income and consumption statistics computed on the basis of microdata at the level of individual households.

F.23.2. Concepts and definitions

The new UNECE Classification of International Statistics Activities, which was introduced in section B.4.3, defines in its section 1.6 income and consumption statistics as the statistics

- on household income and expenditures from the household or individual viewpoint (all types of income and expenditure)
- including topics like distribution of incomes, in-kind income, income transfers received and paid, income or expenditure-based measures of poverty, consumer protection, consumption patterns, consumer goods and durables, household wealth and debts, and
- excluding social protection schemes against various risks, tax schemes, poverty in a multidimensional sense, and living conditions.

The standard definitions of concepts needed in the production of income and consumption statistics on the basis of microdata were set out in the **Resolution concerning household income and expenditure statistics** adopted by the 17th International Conference of Labour Statisticians (ICLS) in December 2003 (see the relevant conference proceedings). They have been take up by the Canberra Group Handbook, the international reference on household income statistics.

In the EU, all member states adhere to the same set of income concepts for the production of EU-SILC achieving a very high degree of harmonisation. These concepts are defined in Annex I of Commission Implementing Regulation (EU) 2019/2242.

F.23.2.1. INCOME CONCEPTS

The Canberra Group Handbook provides the following, so-called **conceptual definition of household income**:

'Household income consists of all receipts whether monetary or in kind (goods and services) that are received by the household or by individual members of the household at annual or more frequent intervals, but excludes windfall gains and other such irregular and typically one-time receipts.

Household income receipts are available for current consumption and do not reduce the net worth of the household through a reduction of its cash, the disposal of its other financial or non-financial assets or an increase in its liabilities.

Household income may be defined to cover: (i) income from employment (both paid and self-employment); (ii) property income; (iii) income from the production of household services for own consumption; and (iv) current transfers received.'

The Handbook considers this as a definition of what should ideally be measured as household income. It juxtaposes it with the more feasible in practice **operational definition** which excludes the value of unpaid domestic services, the value of consumer durables and social transfers in kind.

The four income components mentioned in the definition are, in turn, defined as follows.

*'**Income from employment** comprises receipts from participation in economic activities in a strictly employment related capacity. It consists of payments, in cash or in kind, received by individuals, for themselves or in respect of their family members, as a result of their current or former involvement in paid or self-employment jobs.'*

*'**Property income** is defined as receipts that arise from the ownership of assets (return for use of assets) provided to others for their use. They comprise returns, usually monetary, from financial assets (interest, dividends), from non-financial assets (rent) and from royalties (return for services of patented or copyrighted material).'*

*'**Income from household production of services for own consumption** include services produced within the household for the household's own consumption and not for the market. They include services from owner-occupied dwellings and from consumer durables owned, as well as own-produced domestic services. They are valued net of expenses that go into their production. However, in the operational definition of income, the value of unpaid domestic services and of services from consumer durables are excluded.'*

*'**Current transfers received** are receipts for which the recipient does not provide anything to the donor in direct*

return for the receipts. Transfers can consist of cash (in the monetary sense), of goods, or of services. Transfers may be made between households, between households and government, or between households and charities, both within or outside the country. The main motivation is to redistribute income either by government (e.g., pensions) or privately (e.g. child support). Current transfers received directly affect the level of disposable income available and should influence the consumption of goods and services. They consist of all transfers that are not transfers of capital. In concept, all current transfers received in cash and as goods or services are regarded as income.'

The aggregate of income from employment and **income from household production** of services for own consumption is called income from production. The latter, together with property income comprise **primary income**. Finally, **total income** is the sum of primary income and current transfers received.

An important concept, which appears often among income statistics, is **disposable income**. It is defined as total income minus current transfers paid. These transfers include direct taxes, compulsory fees and fines, current inter-household transfers paid and employers' social contributions. It is the preferred income measure used in analyses of income distribution because it is the income available to the household to support consumption expenditure and saving.

A related measure is **adjusted disposable income**, defined as disposable income plus social transfers in kind. The latter are excluded from the operational definition of income, as already stated, because they are not always easy to quantify.

It should be kept in mind that NA usually refer to different concepts of income and consumption than microdata. Appendix 2 of the Canberra Group Handbook provides a comparison of income concept definitions according to the two approaches.

Social protection statistics are statistics about expenditure on social protection schemes, the receipts of beneficiaries of such schemes and the numbers of beneficiaries of such schemes. Clearly, they are related to household income statistics, since household income includes transfers received from government. However, social protection statistics have only a very partial overlap with income statistics and they focus on social protection schemes (they are the statistical unit) and not on households or persons. Therefore, they are not discussed any further in this chapter. Interested readers may refer to the dedicated section in Eurostat's web site for the European System of integrated Social PROtection Statistics (ESSPROS).

F.23.2.2. CONSUMPTION CONCEPTS

Household consumption and household consumption expenditure are different concepts. Expenditure is used as a proxy of consumption since the latter cannot be measured directly. According to the ICLS Resolution, and its 2023 amendment, **household consumption expenditure** is

'the value of consumer goods and services acquired, used or paid for by a household through direct monetary purchases, own-account production, barter or as income in-kind for the satisfaction of the needs and wants of its members.'

On the other hand, **actual final consumption of a household** is

'the sum of its household consumption expenditure and the value of consumer goods and services acquired or used by the household through transfers from government, non-profit institutions or other households.'

An issue that requires attention is the point in time at which to attribute each expenditure on consumption of goods and services. There are three approaches. According to the **acquisition approach** consumption expenditure is attributed to the point in time at which goods or services are acquired, irrespective of whether they are paid for or used at that time. According to the **use approach** consumption expenditure is attributed to the point in time at which goods or services are used. Finally, according to the **payment approach** consumption expenditure is attributed to the point in time at which goods or services are paid for. Very often, especially for services, these three points in time will coincide.

The ICLS Resolution and its 2023 amendment call the acquisition and the payment approaches as measuring consumption expenditure on an **expenditure basis**, and the use approach as measuring consumption expenditure on a **consumption costs basis**.

A second issue that requires attention is the type of consumer goods purchased. **Non-durable goods** are the consumer goods that are completely consumed on acquisition or gradually consumed over a period of time. **Durable goods** are the consumer goods that are used many times over a long period of time without reducing their capacity to satisfy needs and wants.

F.23.2.3. EQUIVALENCE SCALES

It is very common to compute indicators on a per capita basis. The same applies to household income and consumption. However, it is not as straightforward as dividing household income and consumption by the number of household members. Adults have more needs than children and household members benefit from economies of scale.

For this reason, **equivalence scales** are used. The total disposable household income and total household consumption are 'equivalised' to take into account the impact of differences in household size and composition. The **equivalised income** and **equivalised consumption** attributed to each member of the household are calculated by dividing the total disposable income and consumption of the household by equivalisation factors or weights.

Several equivalence scales have been proposed but there is no common standard accepted by all producers of income and consumption statistics. The Canberra Group Handbook discusses some of the most commonly used ones. Some of

them rely only on the number of household members, while others also take into account the age composition of the household. A very common scale, also used by Eurostat in EU-SILC, the HBS and all policy indicators, is the OECD-modified scale. It gives a weight of 1.0 to the first household member aged 14 or more, a weight of 0.5 to each other household member aged 14 or more and a weight of 0.3 to each household member aged 0-13. Box F.23.1, below, shows the application of this scale, and of some other commonly used ones, on several types of households.

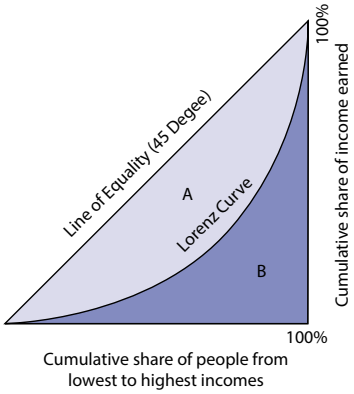
Equivalised income per person is very often used in the derivation of poverty indicators. For instance, a very common poverty indicator is the at-risk-of poverty rate which is defined as the proportion of persons living in households with equivalised disposable income lower than 60% of the national median equivalised disposable income. Please refer to chapter E.12 for details.

F.23.2.4. INEQUALITY INDICATORS

Compared to National accounts, which take a macroeconomic view, an advantage of income and consumption statistics based on microdata is their ability to describe distributions across individuals and households.

One way to describe distributions is to plot the frequency distribution or the histogram of equivalised income or consumption expenditure per person. These diagrams provide a complete picture of the distribution.

A second visual display of income distribution is the **Lorenz curve** of equivalised disposable income. This curve is plotted versus a horizontal axis which shows the cumulative proportion of the persons in the population ranked according to their income and a vertical axis which shows the corresponding cumulative proportion of equivalised disposable household income. Each point on the curve shows the share of total disposable income possessed by the corresponding cumulative proportion of the population. If all persons had the same equivalised disposable household income, the curve would be a straight line with a slope of 45o. The actual curve is below this 'ideal' diagonal and its distance from it gives an impression of the magnitude of inequalities.



This curve is related to a very common numerical measure of inequality, the **Gini coefficient**. Conceptually, this coefficient is the ratio of the area between the Lorenz curve and the diagonal (i.e., area A in the previous diagram) to the total area below the diagonal (i.e., area A+B in the previous diagram). In a case of perfect equality the value of the coefficient is 0.

Box F.23.1: Equivalence scales applied to several household types

The following table shows the total of equivalisation weights for some representative households, according to the OECD-modified scale and two other common equivalence scales:

- OECD scale: It gives a weight of 1.0 to the first household member aged 14 or more, a weight of 0.7 to each other household member aged 14 or more and a weight of 0.5 to each household member aged 0-13. It is also known as the 'old OECD scale'.
- Square root scale: It gives a weight of 1.0 to the first household member aged 14 or more. Each successive household member receives such a weight that the sum of the weights is equal to the square root of the household's size.

Household size	Per-capita income (no sharing)	Equivalence scale			
		OECD equivalence scale	OECD modified scale	Square root scale	Household income (full sharing)
1 adult	1.0	1.0	1.0	1.0	1.0
2 adults	2.0	1.7	1.5	1.4	1.0
2 adults, 1 child	3.0	2.2	1.8	1.7	1.0
2 adults, 2 children	4.0	2.7	2.1	2.0	1.0
2 adults, 3 children	5.0	3.2	2.4	2.2	1.0

Source: Canberra Group Handbook, section 6.4.1.

In a case of total inequality, where all the disposable income of a country is possessed by a single person, the value of the coefficient is 1. For example, according to the most recent data available by country to the World Bank (accessed on its open data platform on 25/10/2023) national Gini coefficients range between 0.63 (South Africa; reference year 2014) and 0.232 (Slovak Republic; reference year 2019).

F.23.3. Sources of data

F.23.3.1 SOURCES OF MICRODATA

The main sources of income and consumption expenditure microdata are **household surveys**. Income surveys are usually separate from consumption expenditure surveys, although income surveys may be collecting a few variables on consumption and vice versa for consumption surveys. Income surveys are usually more frequent (e.g., annual) than consumption surveys. The ICLS Resolution and its 2023 amendment recommend that household consumption surveys should be implemented at least every five years.

Data in household income surveys are collected with personal interviews, which must be carried out with each household member, as recommended by the ICLS Resolution and the Canberra Group Handbook.

The most frequent form of household income surveys is the **cross-sectional survey**. A new sample is collected for each round of the survey, independently from the earlier rounds' samples. However, to study issues such as income dynamics (i.e., how a person's income changes with the passage of time) **longitudinal surveys** are recommended. In these surveys, the sample consists of a number of sub-samples or replications that are all similar in size and design and representative of the whole population. From one year to the next, some replications are retained, while others are dropped and replaced by new replications. This form of sample renewal aims at reducing the risk of sample attrition, i.e., the risk of sample members dropping out of the survey or being lost to follow-up for other reasons.

Box F.23.2: EU statistics on income and living conditions (EU-SILC)

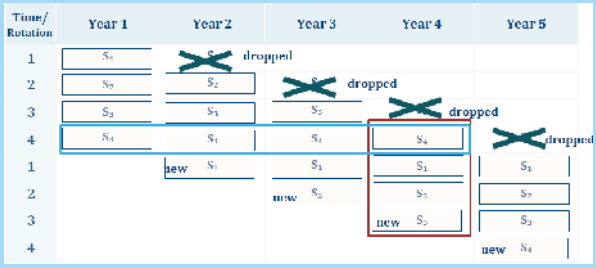
The EU statistics on income and living conditions (EU-SILC) survey aims to collect timely and comparable cross-sectional and longitudinal multidimensional microdata on income distribution, poverty and social exclusion. It also covers various related EU living conditions and poverty policies, such as child poverty, access to healthcare and other services, housing, over-indebtedness and quality of life. It is also the main source of data for microsimulation purposes and flash estimates of income distribution and poverty rates.

The survey was launched in 2003, is implemented annually and gradually expanded to cover, at present, all the EU and several candidate and EFTA countries. Its implementation is regulated by EU legislation and is coordinated and closely monitored by Eurostat. These factors result in highly harmonised income statistics of high quality.

EU-SILC combines survey data and administrative data. While most of countries use survey and administrative data combined, others use only survey data. As of 2021, survey data must be collected by computer-assisted methods including computer-assisted personal interview (CAPI), computer-assisted telephone interview (CATI) and computer-assisted web-interview (CAWI).

EU Member States are obliged by EU legislation to have a minimum four-year rotation scheme. If they consider it possible, they are advised to have a rotation scheme covering six years or more.

The figure below shows what happens with a four-year rotation scheme over five years. The blue rectangle presents one example of the longitudinal data, while the red rectangle presents one example of the cross-sectional data. The sample for any one year consists of four replications, which have been in the survey for between one and four years. Any particular replication remains in the survey for four years; each year, one of the four replications from the previous year is dropped and a new one is added. Between year T and T+1 the sample overlap is 75% (in the absence of attrition); the overlap between year T and year T+2 is 50%; and it falls to 25% from year T to year T+3, and to zero for longer intervals.



At the beginning, a cross-sectional representative sample of households is selected. It is divided into four sub-samples, each on its own representative of the entire population and similar in structure to the entire sample. One sub-sample is purely cross-sectional and is not followed up after the first round. Respondents in the second sub-sample are asked to participate in the panel for two years, in the third sub-sample for three years, and in the fourth for four years. From year 2 onwards, one new panel is introduced each year; the respondents are asked to participate for four years. In any one year, the sample consists of four sub-samples, which together constitute the cross-sectional sample. In the first year they are all new samples, while in all subsequent years only one is a new sample. In year 2, there are three panels; in year 3, one is a panel from the second year and two from the third year; in subsequent years, one is a panel from the second year, one from the third year, and one from the fourth (final) year.

EU-SILC is one of the largest surveys in the EU. The achieved sample size in the 27 EU Member States in 2020 (the latest year for which a quality report is already published) was 239723 households. All countries use random sampling in order to meet precision requirements set out in the legislation.

As already stated in section F.23.1, more than 300 indicators are produced on the basis of EU-SILC, which are useful for the monitoring of numerous key EU policies.

Microdata on income can also be collected from administrative sources, as a complement to household surveys. The ICLS Resolution and its 2023 amendment recommend to use a combination of an income household survey and one or more administrative sources such as tax records or social security records, whenever possible. This is expected to improve the coverage, completeness, and accuracy of the statistics.

Household consumption expenditure data are collected either with the help of questionnaires or with diaries. Data collection with the help of questionnaires is called the **retrospective method** and refers to past purchases over quite long periods, e.g., annual. For reasons of recall, the retrospective method is suitable for large infrequent purchases such as purchases of large durable goods, or for recurring expenses such as utility bills and rents. The questionnaires are completed by a household member, on his/her own or with a personal interview.

In **data collection with diaries** the households are given diaries in which they record all their consumption expenses over a usually short period of time, e.g., two weeks. This method is best for regular, relatively small expenses such as food, personal care items, household supplies etc.

Box F.23.3: The EU Household Budget Survey

The Household Budget Survey (HBS) aims to collect data on households' expenditure on goods and services. In addition, it collects information on key socio-economic characteristics of the households and their reference person.

Most EU Member States launched their national HBS in the 1960s. Eurostat started collecting and publishing HBS data since 1988. The survey is implemented every five years and, at present, covers all EU Member States and a few additional countries. There is no legal basis, hence each country has its own targets, methodology and survey programming. Data supplied by each country are not perfectly harmonised. After each round, some harmonisation efforts have been carried out and each new round of data collection is better harmonised than the previous one. The latest round was implemented in 2020.

Data collection involves a combination of one or more interviews and diaries maintained by households and/or individuals, generally on a daily basis. For the interview, there are four different ways to collect the data: paper-assisted personal interview (PAPI), CAPI which is the most used, CATI and CAWI.

Most countries use random sampling of households. However, a few of them resort to quota sampling instead. The achieved sample size in the 27 EU Member States in 2015 (the latest round for which a quality report is already published) was 279207 households.

Eurostat publishes a large number of indicators on mean consumption expenditure on different categories of goods and services, broken down by various household and individual characteristics, giving a picture of living conditions in EU. The data are also key input for the compilation of weightings for important macroeconomic indicators, such as consumer price indices and national accounts.

A survey can combine both methods for different goods and services. This is, for instance, the case in the HBS described in box F.23.3 or in the consumption expenditure part of Mexico's National Survey of Household Income and Expenditure described in box F.23.4.

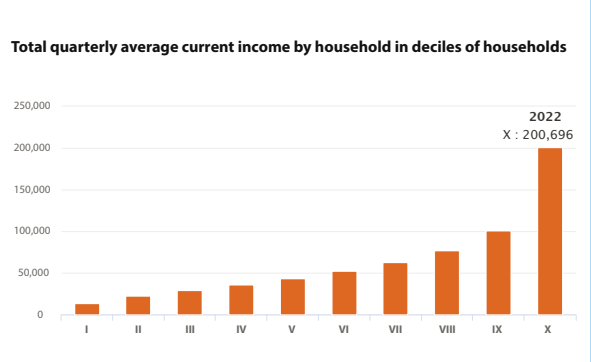
Box F.23.4: National Survey of Household Income and Expenditure (ENIGH), Mexico

The statistical office of Mexico, INEGI, implements an integrated survey of household income and expenditure, ENIGH. It covers a broader set of topics than only household income and final consumption expenditure. In what regards these topics, however, the survey was modified in 2016 to conform to the ICLS Resolution and the Canberra Group Handbook. For this reason, its data from 2016 onwards are designated as 'New series'.

The survey is implemented every two years. It covers the whole country and all households residing in private residences. The effective sample size of the 2020 round was 105 483 housing units.

Data collection is carried out with a combination of personal interviews and self-completion of diaries at household and person level. Diaries are filled-in for seven consecutive days.

The following diagram is an illustration of the results disseminated.



Technical solutions such as scanning of expenditure receipts by the statistical offices are being investigated as means to reduce respondent burden and improve the quality of consumption expenditure data.
Integrated income and consumption surveys are rare because they would impose a very large burden on the households selected in the sample. For instance, in the EU only the Czech Republic and Hungary implement an integrated income and consumption survey. The most common way of obtaining microdata on the joint distribution of income and consumption is statistical matching, which is discussed in section F.23.5.

F.23.3.2 INTERNATIONAL DATA SOURCES

Several international organisations disseminate income and consumption statistics about several countries.

The Luxembourg Income Study Database (LIS) publishes harmonised income microdata and statistics about 50 countries from all the world and about several reference years. Microdata are available only to registered researchers. Income indicators though, computed on the basis of the microdata are available in an online platform to all interested users.

World Bank open data disseminate several indicators among which are poverty indicators. The latter comprise the Gini coefficient of income distribution, a few indicators on income shares held by different percentiles of the population and average income and consumption per capita for the whole population and for the poorest 40% of it.

The statistical database of the Economic Commission for Latin America and the Caribbean, CEPALSTAT, publishes a large number of income distribution indicators for the countries of the region, at national level and regional aggregates of them.

OECD publishes in its Income Distribution Database income distribution statistics for OECD member states and for additional countries.

Finally, Eurostat disseminates household income and consumption statistics in its data browser. For instance, it publishes over 300 indicators based on EU-SILC for EU Member States and candidate countries. In addition, it publishes experimental flash estimates of income inequalities, in other words a forecast of the most recent income distributions in the EU based on microsimulation and macro-economic models, and statistics on the joint distribution of income, consumption and wealth based on statistical matching.

F.23.4. Analysing data quality and identifying problems

Non-response is an issue encountered in all household surveys. It is well known that it reduces the precision of estimates. Moreover, the extent of non-response usually differs between population subgroups, and this is a cause of biased estimates. Non-response may manifest itself as **unit non-response**, where a sample household does not provide any data to the survey, **partial unit non-response**, where only some members of a sample household do not provide any data, or as **item non-response**, where a household responds to the survey but does not provide data on some survey variables. Research findings indicate that unit non-response in consumption expenditure surveys is higher among households with high levels of resources (Sabelhaus et al., 2015).

To deal with non-response, producers of statistics may resort to registers, if the non-respondents can be identified in them, to weighting of the respondents (possibly relying on auxiliary data) to take account of the unit no-response, and to imputation from same household members or other respondents to deal with item non-response.

Underreporting of income or expenditure is also encountered in the surveys. Research findings mention a tendency of households with low levels of resources to underreport their income but not their consumption, and a tendency of households with high levels of resources to underreport their consumption expenditure (Meyer and Sullivan, 2011; Brewer and O'Dea, 2012). Consumption of illegal or socially unacceptable goods (e.g., drugs, gambling etc.) also tends to be underreported.

It is a widespread consideration that household surveys may not provide an accurate picture of the very high end of the income distribution. Households at that end tend to underreport their income or even to not participate in income surveys. Given the share of income that accrues to this group of households, this may lead to underestimation of the extent of inequalities. The Canberra Group Handbook urges extra care on the analysis of survey results about the high end of the distribution. It also presents a method to estimate the high-income households' share of total income based on data from the national tax records.

Box F.23.5: Methodology for calculation of top income shares from tax return data

Source tax data are often available in the following form:national accounts.

Tax rate	Number of returns ('000)	Total income ($m)	Total tax paid ($m)
5%	13 218	76 924	3 846
10%	108 976	1 101 418	110 142
15%	81 051	1 955 871	293 381
25%	30 354	844 825	211 206
28%	6 904	293 631	82 217
33%	2 730	260 213	85 870
35%	1 061	686 067	240 123

The table above is based on taxpayer data from the US Internal Revenue Service (IRS) for 2007. To match these data with that of the entire population, taxable income must first be matched to total income. To ensure consistency over time and across countries, national accounts income data have been used to estimate total income. After adjusting for differences in tax systems, the income of non tax-filers is derived as a residual.

While equivalised disposable household income is normally used for income distribution analysis, the income tax unit varies between countries. For example, in France and the US the tax unit is the family, whereas in Australia and Canada it is the individual. For countries using an individual tax unit, the total population control is the adult population defined as all residents above a certain age cut-off. To convert the individual unit to the family unit, the total population can be defined as the adult population (all the residents above a certain age) less the number of married females.

The researcher may be interested in the top income share of, say, the top 1% of income earners. However, the above data are aggregated based on tax rates such that the top income group does not coincide with the percentile of interest. A model is therefore required to estimate the income of the population of interest. The estimation methodology below uses an interpolation method that assumes the cumulative proportion of people with incomes equal to or greater than y assumes a Pareto distribution, calculated as:

$$F'(y) = 1-(\frac{k}{y})^{p}$$

where k and p are constants to be estimated. The corresponding density function is

$$f(y) = \frac{pk^{p}}{y^{(p+1)}}$$

The key property of this Pareto distribution is that the ratio of the average income μ(y) of individuals or couples with income above y to y does not depend on the income threshold y, and is equal to the Pareto coefficient β= p/(1+p). For example, if β=2, the average income of individuals with income above $1 million is $2 million. In itself, this coefficient is an inequality index, as a higher β is indicative of a fatter upper end in the income distribution. Once this computation has been undertaken for the tabulated groups, it is relatively straightforward to compute, from local approximations of f(y), the share of income for the top 5%, top 1%, top 0.1% and so on.

Source: Canberra Group Handbook, section 6.10.1.

The Canberra Group Handbook also presents a number of income items that require particular attention and proposes ways to deal with them. These items are employee income in kind, self-employment income, property income, income from household production of services for own consumption, and inter-household current transfers. It also discusses social transfers in kind, although they do not form part of the operational definition of income.

The producers of statistics should also keep in mind that registers are not free of problems either. They may not cover completely the population of interest. For example, tax records will not include those households that are exempt from the obligation to file tax returns. Underreporting can also affect registers; tax records, again, may not contain income from informal activities or from transfers from other households.

Finally, an issue that can affect comparability of expenditure statistics between countries is whether the producer of statistics includes imputed rent for owner-occupied dwellings and other non-monetary consumption expenditures in consumption expenditure. For instance, this is the most important methodological difference in quantitative terms between Member States in the EU Household Budget Survey (HBS).

F.23.5. Improving income and consumption statistics

It has already been mentioned in this chapter that data on the joint distribution of income, consumption (and wealth) will greatly improve the understanding of the factors of economic well-being and the identification of vulnerable population groups. It also allows the computation of "mixed" indicators, such as savings that households are able to withhold (or not) from their income once all expenditures have been made.

Producers of official statistics have turned their attention to obtaining microdata on the joint distribution of income and consumption. The Vienna Memorandum issued by the Conference of the Directors-General of National Statistical Institutes (DGINS) in 2016 stated the following:

> *'… information on the joint distribution of income, consumption and wealth (ICW) is not fully available in the existing EU microdata: the three dimensions are traditionally collected separately by three different household data sources: EU-SILC (ESS), HBS (ESS) and HFCS (Household Finance and Consumption Survey implemented by the European System of Central Banks (ESCB)). In each of these sources, information is collected extensively on only one dimension of ICW, with limited coverage of the other two dimensions.*
>
> *Other data sources exist within each country. This calls for an effort to utilise these data sources in a manner that ensures international comparability, thus encouraging a fruitful multisource approach that brings together surveys, registers, administrative sources, Big Data etc.*

and their complementarities, as well as new model-based techniques …

A multisource approach should also aim to address the scarcity of ICW data covering the two extremes of the distribution of income, consumption and wealth. The limits of surveys and administrative data make it necessary at present to rely on academic work and on other sources beyond statistics. However these experiments cannot always close the data gap in a fully satisfactory way in terms of official statistics, thereby pointing to a need for further collaboration of official statistics and the academic and research communities as well as the private sector in this area.'

Although the statement refers to the European Statistical System it has wider applicability.

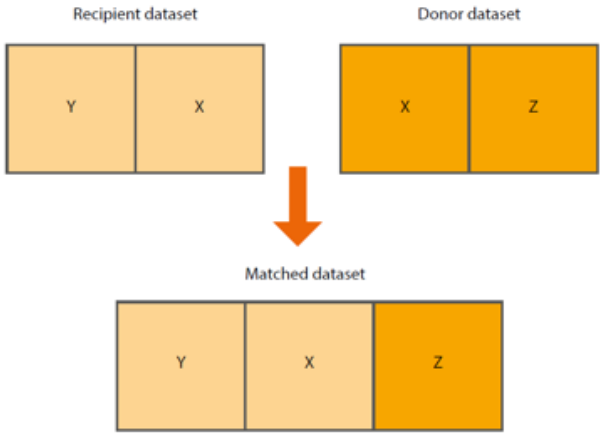
The joint Eurostat-OECD manual Measuring the joint distribution of household income, consumption and wealth at the micro level lists four approaches:

- **Integrated surveys**, which, as already stated, pose large burden on respondents and are, for this reason, quite rare.
- **Multi-source approach**. In this approach, instead of collecting all pieces of information through direct questionnaires, as many variables as possible (in particular economic variables) are gathered from non-survey sources, such as tax/social security registers. The integration between the survey sample and the external sources can then be performed on the basis of identifiers present in both sources (record linkage).
- **Modular approach**. Under such an approach, a single data source contains detailed information on income and consumption, but the selection of variables on the second dimension is more limited and collected through a survey module compiled by either the full sample or a sub-sample of respondents. For example, a survey primarily focused on income may collect some information about consumption expenditure, for example, limited to a 'one-shot' question or focus on one aspect (such as expenditure on food), which is then integrated with more detailed expenditure data from another survey.
- **Statistical matching and modelling**. This approach consists of using those socio-economic variables common to different datasets to merge different samples. Statistical matching techniques assume that individuals or households who are similar with respect to the common variables are also similar with respect to the variables of interest.

Given the response burden of integrated surveys and the lack of registers in many countries, the Eurostat-OECD manual recommends statistical matching as the 'second-best' solution in a setting where only separate income and consumption household surveys (based on two independent samples of the same population) are available.

Statistical matching works, in brief, as follows. Suppose that there are two datasets, one with data on income and the other with data on consumption expenditure. **The recipient dataset** contains a variable Y (for example, disposable income) that is not available in the **donor dataset**, while variable Z (for example, consumption expenditures) is only contained within the donor dataset.

The aim is to use the set of matching variables X, which are available in both datasets, to link records from the donor to the recipient datasets and thereby build a complete 'synthetic', **matched** or . The matched dataset contains records where X, Y and Z are jointly present.



Source: Measuring the joint distribution of household income, consumption and wealth at the micro level, section 3.1.

Attention is required when choosing the recipient dataset. Once filled with the missing variables, it will be the basis of the statistical analysis of the joint distribution of income and consumption. The following criteria were used in the experimental application of statistical matching reported in Measuring the joint distribution of household income, consumption and wealth at the micro level:

- Which dataset contains more accurate data. This one should be the recipient.
- The relative size of the datasets. Using the larger dataset as the recipient provides greater precision for the analysis and prevents information loss. To ensure a minimum number of donor records for each corresponding group in the recipient dataset, Eurostat implemented a threshold, accepting donor samples only if they were at least one third the size of the recipient sample for each group of households.
- Whether the emphasis of the analysis will be on income or on consumption. The corresponding dataset should be the recipient.

The manual provides some points of caution too. The matched dataset should be used only for the production of statistics on the joint distribution of income and consumption

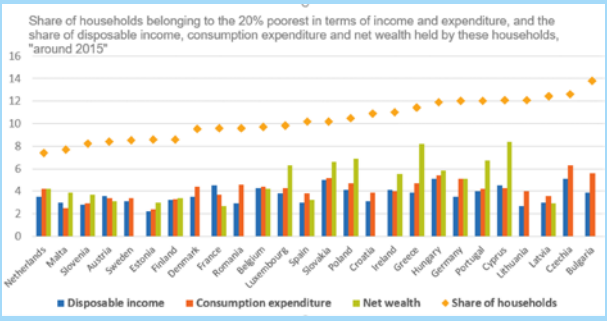
expenditure. Statistics on the 'univariate' distributions of income or consumption must be produced on the basis of the original income or consumption expenditure datasets to have greater precision. Furthermore, the matched dataset must not be used for the analysis of very small subpopulations.

Box F.23.6: Experimental statistics of Eurostat on the joint distribution of income, consumption expenditure and wealth

Eurostat disseminates experimental statistics on the joint distribution of income, consumption and wealth. They are produced with statistical matching of three datasets: EU statistics on income and living conditions (EU-SILC) data for income, the Household Budget Survey (HBS) data for consumption and Household Finance and Consumption Survey (HFCS) data for wealth. The latter is a survey implemented by the European System of Central Banks.

In what concerns income and consumption, the EU-SILC dataset is the recipient and the HBS one is the donor. The dataset resulting from their matching is then used as recipient to receive data from the HFCS dataset. The list of possible matching variables is limited to those that turn out to be evenly distributed across surveys: density level of the population, household size, household type, age of the reference person, level of education, activity status, occupation status, tenure status of the household and main source of income.

The following figure illustrates the type of results that are produced on the basis of a matched dataset.



What is very important, to facilitate statistical matching, is that statistical producers should improve the harmonization of data collection practices of their income and consumption household surveys and should define a core set of socio-economic variables which should then be included in both surveys. A proxy variable of the target in the recipient dataset must be included in the donor dataset to justify the assumptions on which the statistical matching is based, for example an approximate income variable in the expenditure survey.

To find out more…

Reference documents

- Proceedings of the 17th International Conference of Labour Statisticians (ICLS), December 2003. Pages 43-57 contain the Resolution concerning household income and expenditure statistics.
- Resolution to amend the 17th ICLS Resolution concerning household income and expenditure statistics, 2023, ICLS.
- Canberra Group Handbook on Household Income Statistics, 2nd edition.
- Vienna Memorandum issued by the Conference of the Directors-General of National Statistical Institutes, 2016.
- Distributional national account estimates for household income and consumption: methodological issues and experimental results, 2022 edition, OECD and Eurostat.
- Measuring the joint distribution of household income, consumption and wealth at the micro level, 2023 edition, OECD and Eurostat.
- Commission Implementing Regulation (EU) 2019/2242 specifying the technical items of data sets, establishing the technical formats and specifying the detailed arrangements and content of the quality reports on the organisation of a sample survey in the income and living conditions domain
- EU quality report of the EU-SILC 2020
- EU quality report of the Household Budget Surveys 2015

Data sources

- World Bank open data
- Luxembourg Income Study Database
- CEPALSTAT, the statistical database of the Economic Commission for Latin America and the Caribbean
- OECD Income Distribution Database
- Eurostat data browser
- Eurostat statistics on the joint distribution of income, consumption and wealth (experimental statistics)
- Eurostat flash estimates of income inequalities (experimental statistics)
- Eurostat, Income and consumption: social surveys and national accounts (experimental statistics)
- EU statistics on income and living conditions (EU-SILC)
- Eurostat, Household Budget Survey (HBS)
- European Central Bank, Household Finance and Consumption Survey (HFCS)
- National Survey of Household Income and Expenditure (ENIGH), Mexico.

Other references

- Brewer, M. and O'Dea, C. (2012) Measuring living standards with income and consumption: Evidence from the UK. *Institute for Social & Economic Research (ISER), University of Essex*, available at: Measuring living standards with income and consumption: evidence from the UK
- Meyer, B. D. and Sullivan, J. X. (2011) Consumption and Income Poverty over the Business Cycle. NBER *Working Paper*, No 16751, Boston.
- Sabelhaus, J., Johnson, D., Ash, S., Swanson, D., Garner, T., Greenlees, J. and Henderson, S. (2015) Is the Consumer Expenditure Survey Representative by Income? *In Carroll, C. D., Crossley, T. F. and Sabelhaus, J. (eds) Improving the Measurement of Consumer Expenditures, NBER Studies in Income and Wealth vol 74.* Chicago: University of Chicago Press.

G

Guide to statistics in European Commission development cooperation

ENVIRONMENT AND CLIMATE CHANGE

G.24 Environment statistics

G.24. Environment statistics

The chapter in brief

This chapter covers statistics and indicators relevant to European Commission development cooperation in the field of the environment and sustainable management of natural resources.

The chapter starts by listing the main contributions of environmental indicators to environmental and economic policies. It continues by identifying several key indicators used for the environmental issues or topics:

- Air – statistics on emissions to air and ozone depleting substances
- Air quality indicators
- Water – statistics on emissions to water and water resources
- Water quality indicators
- Waste statistics
- Statistics on biodiversity – protected areas
- Land use and land cover statistics

For each indicator mentioned, a brief definition is provided; the environmental issues and relevance for environmental policy are highlighted; the main international agreements and targets are also indicated.

Environment statistics are continuously developed and improved according to new needs, findings, and requirements. This is reflected in the current chapter. To be informed of the most recent developments in this statistics domain, it is recommended to follow the references given in the 'To find out more' boxes provided throughout the chapter.

G.24.1. Policy applications: what this data is used for

G.24.1.1 ENVIRONMENT INDICATORS AND POLICIES

Environmental indicators should be statistics that are scientifically credible and representative of an environmental issue. They should be key, powerful, and cost-effective tools for environmental assessment. Appropriately chosen indicators based on sufficient time series data can show important trends and help describe causes and effects of environmental conditions. They make it possible to track implementation of environmental policies and to assess their efficiency. Environmental indicators can be measured and reported at different scales and at different levels.

National governments use environmental indicators to show the current status and trends with respect to environmental issues of importance, to develop or adapt their environmental policies and to inform their citizens. For example, a town may monitor air quality to estimate impact on the health of the population, degradation of buildings etc., or track air quality along with water quality, or count the number of rare species to estimate the health of the environment in their area.

Environmental indicators contribute to:

- Identifying key factors that cause pressure on the environment and climate;
- Measuring environmental performance with respect to environmental quality and environmental goals; they help set priorities and quantitative targets;
- Integrating environmental concerns in economic and sectoral policies; they help update policies in environmentally significant economic sectors;
- Monitoring progress towards environmentally sustainable development, including decoupling of environmental pressure from economic growth;
- Measuring material flows and resource productivity;
- Informing the public about major environmental trends and conditions: providing information on driving forces, impacts and policy responses is also a common strategy to strengthen public support for policy measures.

Like other indicators environmental indicators have to be interpreted in context and be complemented with country specific information to acquire their full meaning.

In addition, environmental indicators are intended to help:

- Improve environmental reporting at both national and international levels;
- Make national environmental assessments comparable between countries;
- Facilitate data gathering for future regional / national environmental reports.

Criteria used in selecting environmental indicators are:

A. Relevance to national environmental priorities;
B. Relation to international environmental policy;
C. Role as a means of communication for public awareness;
D. Measurability;
E. Availability of time series;
F. Predictive ability: capacity to track the effectiveness of pursued environmental policy.

Environmental statistics are related to, but different from, environmental data and are used, among other things, to assess compliance with national and international legislation. Environmental data are frequently administrative data managed by non-statistical organisations such as ministries or environmental agencies. Those data typically have no statistical definitions, do not use statistical classifications, and are not aligned to international statistical standards.

Box G.24.1: Monitoring as part of environmental management

Environmental monitoring can be described as repeated measurements, with certain intervals, of relevant characteristics with comparable (standardised) methods, in order to follow changes and trends in nature and the environment due to anthropogenic (human-generated) activities over a period of time.

The overall objective of monitoring is not to produce data, but to create relevant information. Therefore, it is essential to identify information needs and the users, as well as to quantify the use of environment information for environmental management. Different information needs may require different monitoring objectives, e.g., to assess average state, in order to adjust management, to check compliance with standards or limit values and/or to detect and assess impacts (e.g., from point sources of pollution) etc. Regarding decision makers, the information would in principle be used to detect problem areas where changes in environmental management are needed and to identify and prioritise efforts to be undertaken.

The responsible public bodies, such as the Ministry of the Environment or an environmental agency, prepare tailor-made strategies for the implementation of monitoring activities by different authorities, institutes, and other stakeholders. Such strategies are based on information needs and encompass business and the sharing of responsibilities between participating institutes, as well as setting monitoring priorities. Such strategies have to be revised on a regular basis (e.g., every 5–10 years).

Keeping in mind that practical solutions should always be preferred, the basic rules for a successful environmental monitoring and assessment programme, as well as for the establishment of a useful monitoring network, can be condensed into some key considerations:

- Information needs must be defined prior to the elaboration of the monitoring programme itself.
- Adequate financial support must be secured.
- Step-by-step approach can be used in implementing the programme.
- Technical details (e.g., pollutants to be monitored, sampling frequency, measurement methods etc.) must be clearly defined in the programme.
- The programme must be evaluated periodically.
- Background data and other monitoring data (like meteorological and statistical data) are nearly always necessary, especially in the assessment and reporting phases.

Box G.24.2: The DPSIR framework

At present, most indicator reports compile sets of physical, biological, or chemical indicators. They generally reflect a system analysis view of the relations between the environmental system and the human system.

According to this system analysis view, social and economic developments are (i) **Driving forces** that exert (ii) **Pressure** on the environment. As a consequence, the (iii) **State** of the environment, such as the provision of adequate conditions for health, resource availability and biodiversity, changes. Finally, this leads to (iv) **Impacts** on human health, ecosystems and materials that may elicit a societal (v) **Response** that feeds back to the (i) Driving forces or directly to the (iii) state or (iv) impacts, through adaptation or curative action. This causal chain is the so-called "DPSIR approach".

From the policy point of view, there is a need for clear and specific information on these five elements. This is achieved by using environmental indicators reflecting the links between human activities and their ultimate environmental impacts as well as the societal responses to these impacts.

Most sets of indicators presently used by national and international bodies are based on the DPSIR-framework or a subset of it.

Source: Environmental indicators: Typology and overview, EEA Technical Report No 25/1999

G.24.1.2 ENVIRONMENTAL SDGs INDICATORS

Environmental sustainability is one of the key pillars of sustainable development. Environmental sustainability is at the core of several of the Sustainable Development Goals (SDGs), which are closely related to the environment statistics covered by this chapter:

SDG 6	Ensure availability and sustainable management of water and sanitation for all
SDG 11	Make cities and human settlements inclusive, safe, resilient and sustainable
SDG 12	Ensure sustainable consumption and production patterns
SDG 13	Take urgent action to combat climate change and its impacts
SDG 14	Conserve and sustainably use the oceans, seas and marine resources for sustainable development
SDG 15	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

The Global indicator framework for the Sustainable Development Goals (SDGs) and targets covers 231 unique indicators for monitoring of progress towards the SDGs and their targets (13 of these indicators inform two or three different targets). Some indicators on related issues are covered under other SDGs, such as SDG 3, 'Ensure healthy lives and promote well-being for all at all ages', (indicators 3.9.1 'Mortality rate attributed to ambient air pollution', 3.9.2 'Mortality rate attributed to unsafe water and sanitation', and 3.9.3 'Mortality rate attributed to unintentional poisoning') as well as SDG 9, 'Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation', (indicator 9.4.1 'CO_2 emission per unit of value added').

The following table shows where the material related to each of these SDGs environment indicators is covered. The reader is reminded that chapter D.10 is devoted to SDGs and sustainable development indicators.

Box G.24.3: Selected SDG indicators on environmental sustainability

SDGs and indicators		Relevant to sub-chapter	
SDG 3	**Ensure healthy lives and promote well-being for all at all ages**		
3.9.1	Mortality rate attributed to household and ambient air pollution	G.24.3	Air quality indicators
3.9.2	Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene (exposure to unsafe Water, Sanitation and Hygiene for All (WASH) services)	G.24.5	Water quality indicators
3.9.3	Mortality rate attributed to unintentional poisoning	G.24.3	Air quality indicators;
		G.24.5	Water quality indicators
SDG 6	**Ensure availability and sustainable management of water and sanitation for all**		
6.1.1	Proportion of population using safely managed drinking water services	G.24.35	Water quality indicators
6.3.1	Proportion of domestic and industrial wastewater flows safely treated	G.24.34	Water – statistics on emissions to water and water resources;
		G.24.35	Water quality indicators
6.3.2	Proportion of bodies of water with good ambient water quality	G.24.35	Water quality indicators
6.4.1	Change in water-use efficiency over time	G.24.34	Water – statistics on emissions to water and water resources
6.4.2	Level of water stress: freshwater withdrawal as a proportion of available freshwater resources	G.24.34	Water – statistics on emissions to water and water resources
6.5.1	Degree of integrated water resources management	G.24.34	Water – statistics on emissions to water and water resources
6.5.2	Proportion of transboundary basin area with an operational arrangement for water cooperation	G.24.34	Water – statistics on emissions to water and water resources
6.6.1	Change in the extent of water-related ecosystems over time	G.24.34	Water – statistics on emissions to water and water resources
SDG 9	**Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation**		
9.4.1	CO_2 emission per unit of value added	G.24.32	Air – statistics on emissions to air and ozone depleting substances
SDG 11	**Make cities and human settlements inclusive, safe, resilient and sustainable**		
11.3.1	Ratio of land consumption rate to population growth rate	G.24.38	Land cover and land use statistics
11.6.1	Proportion of municipal solid waste collected and managed in controlled facilities out of total municipal waste generated, by cities	G.24.36	Waste – statistics on waste generation, movements of hazardous wastes, recycling and disposal
11.6.2	Annual mean levels of fine particulate matter (e.g. PM2.5 and PM10) in cities (population weighted)	G.24.33	Air quality indicators
11.7.1	Average share of the built-up area of cities that is open space for public use for all, by sex, age and persons with disabilities	G.24.38	Land cover and land use statistics
SDG 12	**Ensure sustainable consumption and production patterns**		
12.4.1	Number of parties to international multilateral environmental agreements on hazardous waste, and other chemicals that meet their commitments and obligations in transmitting information as required by each relevant agreement	G.24.36	Waste – statistics on waste generation, movements of hazardous wastes, recycling and disposal
12.4.2	(a) Hazardous waste generated per capita; and (b) proportion of hazardous waste treated, by type of treatment	G.24.36	Waste – statistics on waste generation, movements of hazardous wastes, recycling and disposal
12.5.1	National recycling rate, tons of material recycled	G.24.36	Waste – statistics on waste generation, movements of hazardous wastes, recycling and disposal

Box G.24.3: Selected SDG indicators on environmental sustainability (continued)

SDGs and indicators		Relevant to sub-chapter	
SDG 13 Take urgent action to combat climate change and its impacts			
13.2.1	Number of countries with nationally determined contributions, long-term strategies, national adaptation plans, strategies as reported in adaptation communications and national communications	G.24.32	Air – statistics on emissions to air and ozone depleting substances
13.2.2	Total greenhouse gas emissions per year	G.24.32	Air – statistics on emissions to air and ozone depleting substances
13.b.1	Number of least developed countries and small island developing States with nationally determined contributions, long-term strategies, national adaptation plans, strategies as reported in adaptation communications and national communications	G.24.32	Air – statistics on emissions to air and ozone depleting substances
SDG 14 Conserve and sustainably use the oceans, seas and marine resources for sustainable development			
14.1.1	(a) Index of coastal eutrophication; and (b) plastic debris density	G.24.35	Water quality indicators
14.2.1	Number of countries using ecosystem-based approaches to managing marine areas	G.24.34	Water – statistics on emissions to water and water resources
14.3.1	Average marine acidity (pH) measured at agreed suite of representative sampling stations	G.24.35	Water quality indicators
14.4.1	Proportion of fish stocks within biologically sustainable levels	G.24.37	Biodiversity and protected areas
14.5.1	Coverage of protected areas in relation to marine areas	G.24.37	Biodiversity and protected areas
14.6.1	Degree of implementation of international instruments aiming to combat illegal, unreported and unregulated fishing	G.24.37	Biodiversity and protected areas
14.7.1	Sustainable fisheries as a proportion of GDP in small island developing States, least developed countries and all countries	G.24.37	Biodiversity and protected areas
14.c.1	Number of countries making progress in ratifying, accepting and implementing through legal, policy and institutional frameworks, ocean-related instruments that implement international law, as reflected in the United Nations Convention on the Law of the Sea, for the conservation and sustainable use of the oceans and their resources	G.24.37	Biodiversity and protected areas
SDG 15 Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss			
15.1.1	Forest area as a proportion of total land area	G.24.38	Land cover and land use statistics
15.1.2	Proportion of important sites for terrestrial and freshwater biodiversity that are covered by protected areas, by ecosystem type	G.24.37	Biodiversity and protected areas
15.2.1	Progress towards sustainable forest management	G.24.38	Land cover and land use statistics
15.3.1	Proportion of land that is degraded over total land area	G.24.38	Land cover and land use statistics
15.4.1	Coverage by protected areas of important sites for mountain biodiversity	G.24.37	Biodiversity and protected areas
15.4.2	Mountain Green Cover Index	G.24.37	Biodiversity and protected areas
15.5.1	Red List Index	G.24.37	Biodiversity and protected areas
15.7.1	Proportion of traded wildlife that was poached or illicitly trafficked	G.24.37	Biodiversity and protected areas
15.8.1	Proportion of countries adopting relevant national legislation and adequately resourcing the prevention or control of invasive alien species	G.24.37	Biodiversity and protected areas
15.9.1	(a) Number of countries that have established national targets in accordance with or similar to Aichi Biodiversity Target 2 of the Strategic Plan for Biodiversity 2011–2020 in their national biodiversity strategy and action plans and the progress reported towards these targets; and (b) integration of biodiversity into national accounting and reporting systems, defined as implementation of the System of Environmental-Economic Accounting	G.24.37	Biodiversity and protected areas

Box G.24.3: Selected SDG indicators on environmental sustainability (continued)			
SDGs and indicators		**Relevant to sub-chapter**	
15.a.1	(a) Official development assistance on conservation and sustainable use of biodiversity; and (b) revenue generated and finance mobilized from biodiversity-relevant economic instruments	G.24.37	Biodiversity and protected areas
15.b.1	(a) Official development assistance on conservation and sustainable use of biodiversity; and (b) revenue generated and finance mobilized from biodiversity-relevant economic instruments	G.24.37	Biodiversity and protected areas
15.c.1	Proportion of traded wildlife that was poached or illicitly trafficked	G.24.37	Biodiversity and protected areas

G.24.2. Air – statistics on emissions to air and ozone depleting substances

G.24.2.1. CONCEPTS AND DEFINITIONS

Eurostat publishes data on the following types of air emissions:

- greenhouse gases, which cover seven gases, including CO_2, causing climate change. These gases are responsible for climate change, which in turn has a broad range of consequences for people, flora and fauna;
- air pollutants, which cover seven substances harmful to human health, such as causing respiratory conditions, and detrimental to the environment and biodiversity. Air pollution can cause a variety of adverse health outcomes for people, including the risk of respiratory infections, heart diseases, and lung cancer. Air pollution also has an impact on biodiversity and the condition of the environment.
- Information on emissions of greenhouse gases and air pollutants can be presented from 3 complementary perspectives:

  1. emissions from production in the EU economy (accounts)
  2. emissions from the EU territory (inventories)
  3. emissions related to consumption in the EU (footprints)

Production perspective (accounts): Statistics from the production perspective present greenhouse gas and other air emissions, originating from the EU economy. This means that they are emitted by economic actors and households residing in the EU. They also include emissions from international transport operated by economic actors established in the EU. Eurostat produces annual and quarterly estimates for these statistics.

Territorial perspective (footprints): the European Environmental Agency (EEA) produces territorial data and presents those environmental pressures that occur within the borders of the EU Member States. These data are collected on an annual basis.

Consumption perspective (footprints): These statistics present the emissions linked to final consumption of goods and services in the EU. This includes all emissions that occur throughout the production chain of a product that arrives in the EU for final consumption or investment – irrespective of the industry or country where the emission occurred. This is particularly relevant for the EU as many goods and services that are used in the EU economy are imported. The EU also exports a large proportion of domestic production. For these statistics, Eurostat produces annual estimates.

Eurostat produces statistics according to perspectives 1 and 3 and publishes the territorial statistics (perspective 2) coming from the EEA. While for perspectives 1 and 3 data are provided to Eurostat by the national statistical offices, they have no or a minor role in the production of perspective 2.

More information found in Eurostat's page on Emissions of greenhouse gases and air pollutants.

The emission values are generally expressed in thousands of tonnes (Kt) or million grams (Mg) per year, as appropriate for a particular pollutant. For cross-country comparisons, emissions may also be presented per km^2 of the country's territory, per capita or per unit of gross domestic product (GDP). These emission inventories give a measure of existing and expected pressure on the environment in terms of emissions of harmful substances into the atmospheric air and "distance to target" (if any).

The main source for many pollutants is the burning of fuels, above all petroleum products. In some countries, agriculture and burning of savannas are also important contributors. However, it is difficult to estimate these emissions and data are often not available.

The key question to be answered is: what progress is being made in reducing emissions of pollutants across the country/region? The indicators on emissions to air are important for following manmade emissions that substantially increase the atmospheric concentrations of greenhouse gases. They are also vital for assessing the pressure on atmospheric air quality in the country as a whole. These indicators also allow identifying pressure from sectors such as energy, transport, industrial processes, agriculture, and waste management.

G.24.2.2. SOURCES OF DATA

About *emission inventories*, CLRTAP and its eight protocols Eurostat collects greenhouse gas emissions accounts based on Regulation (EU) 691/2011. In turn, those accounts are based on other primary data sources.

To find out more…

- Eurostat: Emissions of greenhouse gases and air pollutants
- Eurostat: Statistics explained articles related to Climate Change
- Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), Next steps under the Paris Agreement and the Katowice Climate Package, 2019
- DG Environment: Air and the Commission's Clean Air Programme
- EEA: Environmental indicators: Typology and overview, which introduces the EEA 'Typology of indicators' and the DPSIR framework
- European Monitoring and Evaluation Programme (EMEP) for long-range transmission of air pollutants in Europe
- EMEP/EEA: Air pollutant emission inventory guidebook, 1999 edition; Air pollutant emission inventory guidebook, 2019 edition; Air pollutant emission inventory guidebook, 2023 edition
- EMEP: Centre on Emission Inventories and Projections (CEIP)
- European Commission: A Europe that protects: Clean air for all Communication
- European Commission: Industrial Emissions Directive (IED)
- European Commission: NEC directive
- European Topic Centre on Air Pollution, Transport, Noise and Industrial Pollution (ETC/ATNI)
- European Topic Centre on Climate Change Mitigation (ETC CM)
- Intergovernmental Panel for Climate Change (IPCC)
- UN Framework Convention on Climate Change (UNFCCC)
- UNECE: Convention on Long-range Transboundary Air Pollution (CLRTAP)
- UNECE: Guidelines for Reporting Emissions and Projections Data under the Convention on Long-range Transboundary Air Pollution
- UNECE: Guidelines for the Application of Environmental Indicators
- United Nations Environment Programme (UNEP): Vienna Convention for the Protection of the Ozone Layer (1985)
- UNEP: Montreal Protocol on Substances that Deplete the Ozone Layer (1987)
- UNEP: Ozone Secretariat
- World Bank: Open Data Resources for Climate Change

G.24.3. Air quality indicators

G.24.3.1. CONCEPTS AND DEFINITIONS

A clean air supply is essential to our own health and that of the environment. But since the industrial revolution, the quality of the air we breathe has deteriorated considerably - mainly as a result of human activities. Rising industrial and energy production, the burning of fossil fuels and the dramatic rise in traffic on our roads all contribute to air pollution in our towns and cities which, in turn, can lead to serious health problems. For example, air pollution is increasingly being cited as the main cause of lung conditions such as asthma.

Major concerns relate to the effects of air pollution on human health, ecosystems, and buildings, and to their economic and social consequences. Human exposure is particularly high in urban areas where economic activities and road traffic are concentrated. It also happens around industrial zones.

An important source of pollution in many urban areas is fuel combustion in motor vehicles. Further pollution sources are industry and household combustion of fuel (including wood). Generated pollutants include nitrogen oxides (NOx), carbon monoxide (CO), sulphur dioxide (SO2), volatile organic compounds (VOCs), particulate matter (PM10 and PM2.5 depending on their size) and heavy metals such as lead. On warm summer days the strong sunlight leads to a build-up of ground-level (or tropospheric) ozone (O3). Ozone is formed through the reaction between other pollutants (oxidation of VOCs such as benzene in the presence of nitrogen oxides). However, due to the special atmospheric chemistry of ground-level ozone, levels are very often lower in urban areas than in the countryside.

Nowadays a major challenge in many urban zones is to further reduce emissions of local and regional air pollutants in order to achieve stronger decoupling of emissions from GDP and to limit the exposure of the population to air pollution. This implies implementing appropriate pollution control policies, technological progress, energy savings and environmentally sustainable transport policies.

The key indicators in this domain are related to ambient air quality in urban areas, i.e., the concentration of the air pollutants mentioned above. The main pollutants monitored are ground-level ozone, particulate matter (PM10 and PM2.5), sulphur dioxide, nitrogen dioxide and lead. Carbon monoxide and VOCs can also be considered. Box G.24.4 details the key aspects of monitoring data and indicators.

Box G.24.4: Monitoring data and indicators

The collection and analysis of environmental data is necessary for the provision of objective, reliable and comparable information that shall enable actions needed to protect the environment and to ensure transparency in relation to the public.

Primary data are data obtained from monitoring activities. Environmental monitoring generates a huge amount of these primary data. An example is the hourly measured concentrations of pollutants in the air: measuring one pollutant on an hourly basis at one station over one year generates 8 760 data points. As such, these data have very limited or "neutral" information value: one isolated data point just tells what was the concentration of one pollutant at a certain time and at a certain location. In order to get more information, these primary data must be processed, aggregated and analysed in order to produce statistics and indicators. An indicator may simply be a selected statistic (like percentiles or mean values) or an aggregation of several statistics: for example, an air quality index.

While primary data have relatively low information content, indicators are not "neutral": they are linked to defined environmental management issues and allow evaluating or assessing the situation. Using for this assessment the DPSIR framework used by the EEA ensures that issues are handled in a comprehensive way and that all important aspects are covered.

Unit of measurement is µg/m^3, ppm or ppb, as appropriate.

Knowing the concentrations of pollutants allows verification of whether limit values fixed to protect human health and/or ecosystems are exceeded, as well as estimation of the exposure of ecosystems to acidification, eutrophication and ozone. The number of exceedances of limit values and exposure assessment are additional indicators included in the EEA indicators.

G.24.3.2. SOURCES OF DATA

Eurostat collects air pollution accounts based on Regulation (EU) 691/2011. In turn, those accounts are based on other primary data sources.

CLRTAP and its eight protocols cover the methodology of data collection on emissions of pollutants into the air. Internationally agreed methodology and standards for estimating air emissions are included in the EMEP/EEA air pollutant emission inventory guidebook. EMEP acts under the CLRTAP and the EEA's 'Core inventory of air emissions' (EEA CORINAIR). These methods are also linked with the 2019 refinement of the 2006 Guidelines of the Intergovernmental Panel for Climate Change (IPCC), which forms the basis for preparation of national greenhouse gas (GHG) emission inventories and national communications by the countries that are parties to the United Nations Framework Convention for Climate Change (UNFCCC).

At its 42nd session (Geneva, 12-16 December 2022), the Executive Body for the LRTAP Convention adopted the 2023 Guidelines for reporting emissions and projections data under the Convention.

The 2023 Reporting Guidelines were adopted for application in 2024 and subsequent years. However, Parties are encouraged to provisionally apply the Guidelines in 2023. Box G.24.5 shows a sample of national emission tables compiled according to the EMEP/EEA guidebook.

Box G.24.5: Tables of national emissions and national emission trends from the EMEP status report

Each year, EMEP publishes status reports on 'Transboundary particulate matter, photo-oxidants, acidifying and eutrophying components'. The reports present major results of EMEP's activities related to emission inventories, observations and modelling and lot of quantitative information about national emissions. The following two tables are extracts from appendices A and B of Status Report 1/2023.

Table G.24.5.1. National total emissions of main pollutants for 2021 in the EMEP domain. Unit: Gg. (Emissions of SOx and NOx are given as Gg(SO2) and Gg(NO2), respectively.)

Area/Pollutant	SOx	NOx	NH3	NMVOC	CO
Albania	7	27	21	36	80
Armenia	8	44	15	17	47
Austria	11	123	66	111	523
Azerbaijan	86	351	81	381	653
Belarus	73	175	115	169	409
Belgium	23	142	68	122	290
Bosnia and Herzegovina	24	44	23	90	219
Bulgaria	51	94	43	87	267
Croatia	6	46	32	70	217
Cyprus	10	12	6	8	10
Czechia	69	159	67	187	790
Denmark	9	89	71	107	192
Estonia	12	23	10	27	109

Note: the table is an extract of the first rows of table A:1 of the report.

Table G.24.5.2. National total emission trends of sulphur (1990-1999), as used for modelling at the MSC-W (Gg of SO2 per year).

Area/Year	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Albania	6	5	5	4	5	5	6	6	6	7
Armenia	2	3	3	3	3	4	5	6	6	8
Austria	15	14	15	14	13	13	12	11	10	11
Azerbaijan	49	54	59	65	68	72	75	79	77	86
Belarus	69	65	61	58	60	63	65	68	68	73
Belgium	47	43	41	41	34	32	32	30	24	23
Bosnia and Herzegovina	283	286	290	293	243	193	143	93	42	24
Bulgaria	323	163	154	135	94	93	79	72	69	51
Croatia	24	17	14	16	15	12	10	8	6	6
Cyprus	16	13	17	13	16	16	17	16	12	10
Czechia	160	145	134	129	115	110	97	80	67	69
Denmark	13	13	11	10	10	10	11	9	9	9
Estonia	43	42	44	36	35	39	31	19	11	12

Note: the table is an extract of the first rows of table B:1 of the report.

Source: EMEP Status report 1/2023

In many countries, data on ambient air pollution are routinely collected by national or local monitoring networks which include several monitoring stations where samplings (and measurements in case of automatic stations) are made. Most of the time, these networks are managed by public authorities at the national, regional or municipal levels. At the national level, monitoring of air quality and its management falls under the responsibility of the Ministry of the Environment or the Ministry for Health and their agencies. Data can also be collected for research purposes by universities and research institutes. In addition, industries can be obliged to monitor air quality in their surrounding area in accordance with the obligations specified in the environmental permit granted by the competent authorities.

Monitoring stations can be classified according to the main sources of pollution affecting air quality in their surroundings (mainly industrial, traffic or background oriented stations).

They can be located in urban, suburban or rural zones. Monitoring data must be representative both in terms of time (i.e., covering a representative time period) and space (i.e., representing a significant area and/or population exposure). Indicators aggregating the monitoring data may be designed and constructed in a number of ways. Examples of statistics used for air quality indicators are: the annual mean and percentiles values, the number of days or hours with concentration exceeding a certain value etc. Where monitoring data are unavailable, estimates of pollution levels may be made using air pollution models or other methods (e.g., monitoring campaigns with diffusion tubes, bioindicators etc.).

To find out more…

- Eurostat: Statistics explained articles related to Air Pollution
- Eurostat: Air pollution statistics - air emissions accounts (Statistics explained article)
- EEA: Air Quality e-Reporting
- EMEP: Status Report 1/2023
- EMEP/EEA: Air pollutant emission inventory guidebook, 2019 edition; Air pollutant emission inventory guidebook, 2023 edition
- European Commission, DG Environment: Air policy
- Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe
- European Environment Agency: Air Pollution
- IPCC: 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories
- UNECE: updated Guidelines for Reporting Emissions and Projections Data under the CLRTAP
- United Nations Environment Programme: Urban Air Quality Management Toolbook

G.24.4. Water – statistics on emissions to water and water resources

G.24.4.1. CONCEPTS AND DEFINITIONS

Key environmental indicators in this environmental sector are:

A. Renewable freshwater resources
B. Freshwater abstraction
C. Household water use per capita
D. Water losses
E. Reuse and recycling of freshwater
F. Polluted (non-treated) wastewaters
G. Water quality in urban areas (covered in a separate chapter)

Renewable freshwater resources are defined as the total volume of river run-off and groundwater generated under natural conditions, exclusively by precipitation within the country, and the actual flow of rivers and groundwater coming from neighbouring countries. The measurement units are million cubic metres (m^3) per year.

The development of this indicator provides a measure of the state of renewable freshwater resources in a country.

The total volume of fresh surface water and groundwater abstracted annually is another indicator: total, by economic activity (in accordance with ISIC/NACE) and as a percentage of renewable freshwater resources (the country's **water exploitation index**, or **WEI**). The indicator provides, in relation to total resources available for abstraction, a measure of the pressure on the environment in terms of abstraction of freshwater resources. It can reflect the extent of water resource scarcity and the distribution of abstracted water among different economic activities.

Since water quality is often linked to water quantity - e.g., flow or volume affects quality by influencing concentration of pollutants - the relation of freshwater abstraction to renewal of stocks is a central issue in sustainable freshwater resource management. The indicator can show to what extent freshwater resources are already used and whether there is any need to adjust supply and demand management policy. Changes in the WEI help to analyse how changes in abstraction affect freshwater resources by increasing pressure on them or making them more sustainable. The WEI threshold that distinguishes non-stressed regions from stressed ones is around 20%. Severe water stress can occur where the WEI exceeds 40%.

Main concerns related to the inefficient use of water and to its environmental and socio-economic consequences are the following: low river flows, water shortages, salinization of freshwater bodies in coastal areas, human health problems, loss of wetlands, desertification and reduced food production. Pressures on freshwater resources are exerted by overexploitation and by degradation of environmental quality.

Household water use per capita is the quantity of water used to cover the household and related utility needs of the population. The unit is cubic metres per year and per capita (or litres/day per capita). The indicator – to be considered in relation with available resources - is one of the major ones defining the level of development of water economy services and the degree of water accessibility to cover all household needs of the population. This indicator helps identify trends in rational water use in a particular location.

Water losses are defined as the quantity and percentage of freshwater lost during transport (owing to leakage and evaporation) between a point of abstraction and a point of use. The amount of water lost during transport to users is an indicator of the efficiency of a water management system, including technical conditions affecting water supply pipelines.

The share of reused water in the total volume of water used to cover production needs defines the percentage of water saved by applying reused water in supply systems as a national total and broken down by some economic activities.

At the international level, the Convention on the Protection and Use of Transboundary Watercourses and International Lakes, more simply known as the 'Water Convention', requires that the parties introduce sustainable water management, including an ecosystem approach, and the rational and fair use of transboundary waters. In the European Union, the Water Framework Directive obliges the Member States to promote sustainable use based on long-term protection of available water resources and to ensure a balance between abstraction and recharge of groundwater, with the aim of achieving "good groundwater status".

G.24.4.2. SOURCES OF DATA

Eurostat collects water statistics based on the joint questionnaire on inland waters, which is coordinated with OECD. International coordination with UNSD and FAO is also very strong.

Many of the water statistics produced by Eurostat have been used in the context of the development of EU legislation relating to water, as well as for environmental assessments, which in turn can give rise to new data needs.

Water statistics are collected through the inland waters section of the joint OECD/Eurostat questionnaire which is an established data collection yielding long time series, but which can also be adapted to meet the demands of relevant policy frameworks. It currently reports on the following:

- freshwater resources in groundwater and surface water — these can be replenished by precipitation and external inflow (water flowing into a country from other territories);
- water abstraction — a major pressure on resources, although a large part of the water abstracted for domestic, industrial (including energy production) or agricultural use may be returned to the environment and its water bodies (although often as wastewater with impaired quality);
- water use — analysed by supply category and by industrial activities;
- the share of the population connected to wastewater treatment plants — which gives an overview of the development status of the infrastructure, in terms of quantity and quality, that is available for the protection of the environment from pollution by wastewater;
- sewage sludge production and disposal — an inevitable product of wastewater treatment processes, its impact on the environment depends on the methods chosen for its processing and disposal;
- generation and discharge of wastewater — pollutants present in wastewater have different source profiles and, similarly, the efficiency of treatment of any pollutant varies according to the method applied.

In general, Eurostat collects national data. However, some variables are also requested for river basin districts (according to the EU Water Framework Directive, see 'Context' below) by means of a regional questionnaire for some of the categories above.

A large amount of data and other information on water is accessible via WISE, the water information system for Europe, which is hosted by the EEA in Copenhagen.

In many countries around the world data on household water use are still collected by the government branch dealing with housing and municipal services. WHO and UNICEF collect estimates of national average figures from governments as part of their Joint Monitoring Programme (JMP) for water supply and sanitation which has been reporting country, regional and global estimates of progress on drinking water, sanitation and hygiene (WASH) since 1990. The JMP indicators feed into the SDG indicators framework, informing Sustainable Development Goal 6 'Ensure Availability and Sustainable Management of Water and Sanitation for All'.

When working with water losses, the most important issue is to have data on the quantities of freshwater lost from water supply systems between a point of abstraction and a point of use due to leakage or evaporation The indicator is estimated and defined as the absolute and relative difference between the amount of water abstracted and the amount delivered to users (households; agriculture, forestry and fishing; manufacturing, the electricity industry and other economic activities).

Data on reused and recycled water are collected through reporting by enterprises and other organizations for statistical purposes. Data on wastewater treatment can also be obtained from municipalities.

In general, data quality can be considered to be fairly good.

Box G.24.6: Guidance about the compilation of water data

Guidance can be found at the international level in the World Meteorological Organisations's (WMO) Guide to Hydrological Practices and in the EEA's Eurowaternet Quantity - technical guidelines for implementation.

Additional information can also be found in the UNSD/UNEP Questionnaire on Environment Statistics, coordinated with the relevant OECD and Eurostat Joint Questionnaire on Inland Waters. The respective Data collection Manual provides guidance, best practice and standards for estimating and compiling data for the questionnaire.

The Living Standards Measurement Study - Integrated Surveys on Agriculture (LSMS-ISA) has issued a guidance note called 'Improving Household Survey Instruments for Understanding Agricultural Household Adaptation to Climate Change: Water Stress and Variability'. This note focuses on improving household survey instruments for understanding how agricultural households adapt to weather variability, caused by global climate change. It also outlines instruments for measuring local water resources, including rainfall, surface water, and groundwater.

To find out more…

- Eurostat: Statistics explained articles related to Water
- DG Environment: Water
- EEA: Eurowaternet Quantity - technical guidelines for implementation
- EEA: Water
- European Commission/EEA: Freshwater Information System for Europe (WISE – Freshwater)
- European Commission: Water Framework Directive (WFD)
- European Flood Awareness System (EFAS)
- European Topic Centre on Inland, Coastal and Marine waters (ETC/ICM)
- Eurostat: Data Collection Manual for the OECD/Eurostat Joint Questionnaire on Inland Waters and Eurostat Regional Water Questionnaire
- Food and Agriculture Organization (FAO): AQUASTAT database
- IPCC: Assessment Reports on Climate Change
- Joint Monitoring Programme: Global estimates for WASH
- Joint Monitoring Programme: Monitoring methods
- Joint Research Centre (JRC): Desertification and drought and Floods
- LSMS-ISA: Improving Household Survey Instruments for Understanding Agricultural Household Adaptation to Climate Change : Water Stress and Variability (2011)
- OECD Environmental Data Compendium - Inland Waters section
- UNECE: Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Water Convention)
- UNSD/UNEP: Questionnaire on Environment Statistics
- World Bank: Living Standards Measurement Study – Integrated Surveys on Agriculture (LSMS-ISA)
- World Meteorological Organization: Global Hydrometry Support Facility (WMO HydroHub) and World Hydrological Cycle Observing System (WHYCOS)
- World Meteorological Organization: Guide to Hydrological Practices (2008; updated 2020)

G.24.5. Water quality indicators

G.24.5.1. CONCEPTS AND DEFINITIONS

Water quality is about what is in water and how quality affects its usefulness.

There are no European statistics on water quality. However, the European Environment Agency (EEA) produces information on water quality.

Water is a precondition for human, animal and plant life as well as an indispensable resource for the economy. Water also plays a fundamental role in the climate regulation cycle.

Rivers have often been treated unwisely as a convenient way of transporting waste to the sea, affecting the biodiversity of thousands of kilometres of waterways, harming human health, and in the end polluting coastal and marine waters. Protection of water resources, of freshwater and saltwater ecosystems and of the water we drink and bathe in is therefore one of the cornerstones of environmental protection. The stakes are high and the issues transcend national boundaries and concerted action between countries is very often necessary to ensure an effective protection of water basins.

Box G.24.7: Water Resource Information System – India

The government of India set up in 2018 the Water Resource Information System (WRIS). Its aim is that the WRIS will be the single point of entry for information about the water resources of the country. The WRIS presents data and information in a standardized GIS framework and enables users to retrieve, visualize, analyse and understand comprehensive water data of interest.

The creation of the system was a response to the requirements posed by the National Water Policies of 2002 and 2012 for, among other things, "a well-developed information system, for water related data in its entirety, at the national/ state level", "a modern information system promoting free exchange of data among various agencies", which "should include comprehensive and reliable projections of future demands of water for diverse purposes", "putting all hydrological data, other than those classified on national security consideration in the public domain" and "integrating all water related data, like rainfall, snowfall, geo-morphological, climatic, geological, surface water, ground water, water quality, ecological, water extraction and use, irrigated area, glaciers, etc., with well-defined procedures and formats to ensure their online updating and transfer and to facilitate development of database for informed decision making in the management of water." The WRIS is also in line with India's Hydro-Meteorological Data Dissemination Policy of 2018.

The WRIS serves as a portal which disseminates water data classified into various categories, such as:

- Surface water
- Ground water
- Land cover and user
- Hydro-meteorological information (rainfall, evapo-transpiration, soi moisture etc)

The WRIS also provides tools for regional authorities to submit data and for users to retrieve data as well as a repository of publications presenting the activity of the country's authorities that manage water resources as well as the results of projects and research activities related to water resources.

Source: WRIS website.

G.24.5.2. SOURCES OF DATA

Data on water quality are often routinely collected at several sites where sampling is made. In most countries, the Ministry of Health (or a public health agency) is responsible for the surveillance of drinking-water supply. Besides drinking water, water quality monitoring is usually under the responsibility of the Ministry of the Environment or the ministry in charge of water management. In practice, implementation is done by several institutions.

Monitoring data must be representative both in terms of time (i.e., adequate sampling frequency) and space (i.e., representing average conditions over a region or country).

Data on drinking water quality are usually presented in the form of tables which present selected microbiological and chemical quality parameters measured, the total number of samples, the number of non-compliant samples and the percentage of non-compliant samples in each category.

Data on the quality of other bodies of water are generally presented in the form of tables which include annual averages of water parameters and the respective national water quality standards or international water quality targets.

International Recommendations for Water Statistics (IRWS) were developed to assist countries establish and strengthen information systems for water. Among others, these recommendations provide the necessary information for deriving coherent and consistent indicators, enabling comparisons over time and between countries from an agreed list of data items.

The UNSD Environmental Indicators Database provides some data transmitted by national statistical agencies.

At the European level, the Water Information System for Europe (WISE) is the gateway to information on European water issues. It compiles data and information collected at EU level by various institutions and bodies.

To find out more…

- DG Environment: Water
- EEA: Water
- European Commission/EEA: Water Information System for Europe (WISE)
- European Commission: Water Framework Directive (2000/60/EC)
- European Commission: Drinking Water Directive (2020/2184)
- European Commission: Nitrates Directive (91/676/EEC)
- European Commission: Urban Wastewater Treatment Directive (91/271/EEC)
- European Commission: Industrial Emissions Directive (IED)
- European Topic Centre on Inland, Coastal and Marine waters (ETC/ICM)
- FAO: Aquastat
- India – Water Resource Information System
- UNEP: Water Quality Index for Biodiversity (WQIB)
- UNEP/UNECE: Guidelines for the Application of Environmental Indicators
- United Nations Statistics Division (UNSD): Environmental Indicators
- UNSD: International Recommendations for Water Statistics (IRWS)
- World Health Organization (WHO): Guidelines for drinking-water quality (including water quality monitoring)

G.24.6. Waste – statistics on waste generation, movements of hazardous wastes, recycling and disposal

G.24.6.1. CONCEPTS AND DEFINITIONS

Key environmental indicators in this environmental sector are:

A. Waste generation

B. Transboundary movements of hazardous wastes

C. Waste reuse and recycling

D. Final waste disposal

Total waste intensity should be presented in kilograms per unit of GDP at constant prices; municipal waste intensity should be expressed in kg per capita or in m3 per capita. It can also be presented in terms of waste (kg) generated per unit of production (tonne, kWh etc.)

The waste intensity represents a driving force indicator and shows response to anthropogenic activities. Waste generated per unit of GDP (total waste intensity) shows whether there has been any decoupling of waste generation from economic growth. Municipal waste generation per capita allows comparisons of countries. Each generation indicator should be shown together with the corresponding per GDP unit or per capita indicator to get the full benefit of it.

Box G.24.8: Evaluation of composition of waste and routine data collection

Pilot Study implemented by the EU CARDS project 'Development of a National Environmental Monitoring System for Bosnia and Herzegovina (RANSMO)'

The amount of waste generated within a municipality in Bosnia and Herzegovina is established by estimation. The best method of establishing waste density is by the use of a weighbridge. However, very few municipalities have a mechanism for bulk weighing, let alone a weighbridge at the dump site. In addition, density does not give you total volume – which is necessary for evaluation of the long-term capacity of the landfill site.

Each municipality has its own methodology for estimating waste volumes. The three most common methods used, each one with significant limitations, are:

- **Number of containers collected x size of container = volume**
  Compaction is rarely performed at the container level, so a container could be filled by a very small amount of waste (i.e. empty boxes). This would give an inaccurate result of total volume of waste produced.
- **Number of truck collections performed x size of collection vehicles = volume**
  Compaction is rarely performed at the truck level, so a truck could be filled by a very small amount of waste (i.e. empty boxes). This would give an inaccurate result of total volume of waste produced.
- **Estimated volume x estimated density for generic (household or industrial) waste = tonnes**
  The density of waste varies greatly dependent on what it is (e.g. plastic is lighter (less dense) than sawdust). Using a single figure to calculate waste density without knowing the type of waste present would give an inaccurate total density of waste produced.

A pilot study was undertaken to evaluate different methods of assessing household waste generation by Communal Enterprises as well as looking at the different types of waste arising from different generators (households, schools and institutions). The approach was based on the need to provide better information on the composition of waste, to allow a more accurate calculation of volume and density, and to establish better mechanisms for treatment, recycling and compliance to legislative requirements.

Three methods for the evaluation of composition were used:

- Simple questionnaires completed by the driver/ collectors of waste
- Separation of waste at source in a "controlled" (i.e. school or hospital) environment
- Physical sorting exercises performed on collected wastes at the landfill.

The pilot study was implemented in 14 municipalities. They were chosen to be representative of the overall socio-cultural context. This ensures that the results can be extrapolated to the whole country. Each study was performed twice, to cover the winter and summer periods, as seasonal influences are perceived by municipality staff to be very pronounced.

The specific methodologies implemented for assessment of waste from each of the different producers (households, schools and medical facilities) were designed to gather data on:

- **Composition of wastes** from a given source
- **Volume** of each waste type
- **Weight** of each waste type
- **Density conversion factor** of volume to weight for a given waste type. This is particularly useful for estimation of Municipal Solid Wastes (domestic type wastes) as the lack of compaction vehicles yields a MSW density different to those in countries that have many compaction vehicles.

Transboundary movements of hazardous waste relate to the total amount of hazardous waste, expressed in metric tonnes per year, exported and imported by a country. Trends in a country's export of hazardous waste show its response to the need to minimize the generation of hazardous waste and to reuse or recycle it domestically. Toxic, explosive, oxidizing, corrosive, flammable, irritant, teratogenic, mutagenic, carcinogenic, ecotoxic and infectious waste are recognized as hazardous waste.

Waste reused or recycled as a share of the total waste in a country – in total, by sector (industrial and municipal solid waste) and by negative impact (hazardous waste) is another indicator. Waste reuse and recycling is an important component of sustainable use of resources in general and of sustainable solid waste management in particular.

Final waste disposal is the share of the total amount of waste generated – in total, broken down by sector and broken down by negative impact – that is finally disposed of by incineration (without energy recovery or use as a fuel) or land filling at a controlled site. The indicator provides a measure of the pressure on the environment and the response to the efficiency of the waste management system.

In the EU, the Waste Framework Directive provides for increased efforts to prevent and reduce waste generation, recover waste and develop new techniques for final disposal of waste. The European Union's approach to waste management is based on three principles: waste prevention; recycling and reuse; improving final disposal and monitoring.

G.24.6.2. SOURCES OF DATA

The precise definition of what constitutes waste varies. According to the Basel Convention, whose framework agreements were also signed by several partner countries (e.g., Afghanistan, Senegal, Nigeria, Indonesia, Trinidad and Tobago), wastes are substances or objects which are disposed of, are intended to be disposed of, or are required to be disposed of by the provisions of national law. Principally, waste consists of materials that are not primary products (i.e., produced for the market), for which the generator has

no further use, and discards, intends to discard or is required to discard. Waste statistics should group waste according to main economic activities (ISIC).

Industrial waste covers waste generated by mining and quarrying, manufacturing industries, energy production and construction. Waste from industrial activities that is removed by municipal waste collection should be reported under the respective sector of generation.

Municipal solid waste includes all municipal waste collected plus the estimated amount of municipal waste from areas not served by a municipal waste collection service. The amount reported under "total waste generation" should be equal to the sum of the waste amounts reported as industrial waste, waste generated by other economic activities (e.g., agriculture and forestry) and municipal solid waste.

Hazardous waste includes those of the above-mentioned categories which should be controlled according to the Basel Convention.

Data on the generation of both industrial and municipal waste are collected by authorities responsible for the environment or by national statistical offices (NSOs). Countries report data on internationally agreed types of hazardous waste to the Secretariat of the Basel Convention and waste generation data to UNSD in their response to the UNSD/UNEP Questionnaire on Environment Statistics.

Data on municipal waste collected are usually gathered through surveys of municipalities or from transport companies that collect waste and transport it to a disposal site. Such surveys deliver fairly reliable data. However, coverage will vary, depending on the extent that municipal waste collection covers small industries and the services sector. Waste collected by the informal sector, waste generated in areas not covered by the municipal waste collection system or illegally dumped waste, are not included. Caution is therefore advised when comparing countries.

Data on transboundary movement of hazardous wastes are collected by customs offices and by environmental protection authorities in frontier areas. The most reliable and complete information can be obtained from Basel Convention focal points or competent authorities, which are responsible for reporting to the Convention secretariat. Some horizontal information, also for a number of partner countries, is available in the Waste section of the United Nations Statistics Division's site on International and regional environmental data sources.

Reuse and recycling is defined as any reprocessing of waste material in a production process that diverts it from the waste stream, except reuse as fuel (energy recovery). Assessment of reused and recycled waste requires precise assessment of total waste and the specific category of waste (industrial, municipal or hazardous). The indicator of waste reuse and recycling is derived by dividing the quantity of waste reused and recycled by the total quantity of waste and specific-category waste generated. For municipal waste, the proportion of reused and recycled waste may be presented as a distribution of components, such as metals, plastic, paper, glass, textiles or organic materials. Data on reuse and recycling of waste are usually collected by ministries responsible for urban affairs and the environment and by NSOs.

To measure the proportion of waste disposed of by different methods, a combination of several methods can be used. Data on final disposal of waste are collected by ministries responsible for urban affairs and environment and by NSOs. Data on generation and disposal of both industrial and municipal waste are collected by the authorities responsible for the environment or by NSOs.

The UNSD/UNEP Questionnaire on Environment Statistics provides a methodology for calculating waste generation by sector, for calculating waste reuse and recycling as well as for calculating final disposal. The Basel Convention has established an internationally agreed methodology for calculating the amount of hazardous waste generated.

To find out more…

- Eurostat: Waste statistics
- Eurostat: Statistics on the circular economy
- Basel Convention
- DG Environment: Waste and recycling
- EEA: Resource efficiency and waste indicators
- European Commission: Waste Framework Directive
- European Topic Centre on Waste and Materials in a Green Economy (ETC/WMGE)
- OECD: Resource productivity and waste
- OECD: Extended Producer Responsibility - Updated Guidance for Efficient Waste Management
- UNSD/UNEP: Questionnaire on Environment Statistics
- UNSD: International and regional environment data sources

G.24.7. Biodiversity and protected areas

G.24.7.1. CONCEPTS AND DEFINITIONS

Indicators on biodiversity and protected areas are a vital part of environment statistics. The protected areas indicator shows the areas of land, water surfaces and adjacent air layer protected in compliance with national legislation. It includes the area of highly protected territories and their share in the total area of the country. Additional indicators can be developed for the categories of natural territories which have a special International Union for the Conservation of Nature (IUCN) status and for the national categories of protected areas to demonstrate their respective extent and share in the total area of the country. The indicator is expressed as total area in km2 and as a percentage of the total country territory as well as by IUCN category.

The indicator provides a measure of the response to the degradation of ecosystems and the loss of biodiversity in a country. It demonstrates the extent to which areas important for conserving biodiversity, cultural heritage, scientific research (including baseline monitoring of processes in the ecosystems),

recreation, natural resource maintenance and other environmental values are protected from incompatible uses.

Sustainable development depends on a sound environment, which in turn depends on ecosystem diversity. Protected areas, especially the full range of IUCN Protected Area Categories, are essential for conserving biodiversity and contributing to sustainable development.

Measures to conserve or restore biodiversity are taken at different geographical and policy levels (international, regional and national). These measures may have different criteria and objectives but can be complementary. Thus, the indicator concentrates on the trends of designated areas extent according to these different policy instruments and on how effective the instruments are in reaching objectives (sufficiency index).

At the international level, the United Nations Convention on Biological Diversity (CBD) aims at the establishment and maintenance of comprehensive, effectively managed and ecologically representative national and regional systems of protected areas. Recommendation 16 of the Fourth World Congress on National Parks and Protected Areas establishes a target of 10% protected areas for each biome (major ecosystem type).

G.24.7.2. SOURCES OF DATA

Eurostat is developing and promoting statistics based on the System of Environmental-Economic Accounting Ecosystem Accounts (SEEA EA). SEEA EA constitutes an integrated and comprehensive statistical framework for organizing data about habitats and landscapes, measuring the ecosystem services, tracking changes in ecosystem assets, and linking this information to economic and other human activity. The United Nations Statistical Commission adopted the SEEA Ecosystem Accounting at its 52nd session in March 2021.

The SEEA EA is built on five core accounts. These accounts are compiled using spatially explicit data and information about the functions of ecosystem assets and the ecosystem services they produce.

The five ecosystem accounts are:

1. ECOSYSTEM EXTENT accounts record the total area of each ecosystem, classified by type within a specified area (ecosystem accounting area). Ecosystem extent accounts are measured over time in ecosystem accounting areas (e.g., nation, province, river basin, protected area, etc.) by ecosystem type, thus illustrating the changes in extent from one ecosystem type to another over the accounting period.

2. ECOSYSTEM CONDITION accounts record the condition of ecosystem assets in terms of selected characteristics at specific points in time. Over time, they record the changes to their condition and provide valuable information on the health of ecosystems.

3. & 4. ECOSYSTEM SERVICES flow accounts (physical and monetary) record the supply of ecosystem services by ecosystem assets and the use of those services by economic units, including households.

5. MONETARY ECOSYSTEM ASSET accounts record information on stocks and changes in stocks (additions and reductions) of ecosystem assets. This includes accounting for ecosystem degradation and enhancement.

Project INCA (Integrated Natural Capital and ecosystem services Accounting) tested SEEA EA in the EU. It is a joint project of Eurostat, DG Environment (DG ENV), DG Research and Innovation (DG RTD), the Joint Research Centre of the European Commission (JRC) and the European Environment Agency (EEA). INCA run between 2015 and 2022. Public outputs from the INCA projects and further information are available from the Eurostat methodological section on environment (under the heading 'ecosystem accounts') and the website of DG Environment on natural capital accounting.

The Commission proposal for a Regulation introducing new environmental accounts modules (COM/2022/329 final) would require Member States to produce this information in the future.

In addition, Eurostat publishes data on protected areas and common bird indicators. The variety of birds are used as indicators for assessing the health of the environment. In addition, the number of bird species reflects the level of biodiversity. Studies show that the richness of bird species correlates with the richness of other flora and fauna: the richer the flora and fauna, the richer the number of bird species.

To find out more…

- Eurostat: Ecosystem accounts - measuring the contribution of nature to the economy and human wellbeing (Statistics explained article)
- System of Environmental Economic Accounting (SEEA) - Ecosystem Accounting
- Eurostat: statistics on protected areas and birds
- Biodiversity Indicators Partnership (BIP)
- Biodiversity Information System for Europe (BISE)
- Convention on Biological Diversity (CBD): 2011-2020 UN Decade on Biodiversity, Aichi Biodiversity Targets, CBD Strategic Plan for Biodiversity 2011-2020, Global Biodiversity Outlook (GBO), Post-2020 Global Biodiversity Framework
- DG Environment: Biodiversity strategy for 2030, Natura 2000, Natura 2000 Biogeographical regions, Nature and Biodiversity
- EEA: EUNIS diversity database
- European Commission: Birds Directive, Habitats Directive, EU Biodiversity Strategy for 2030
- European Parliament: Resolution on Halting the loss of biodiversity by 2010
- European Topic Centre on Biological Diversity (ETC/BD)
- JRC: Healthy biodiversity
- International Union for Conservation of Nature (IUCN)
- IUCN: IVth World Congress on National Parks and Protected Areas
- OECD: Biodiversity
- Pan-European Common Bird Monitoring Scheme (PECBMS)
- Streamlined European Biodiversity Indicators (SEBI)
- UNEP: World Conservation Monitoring Centre (UNEP-WCMC)
- United Nations Statistics Division (UNSD): Environmental Indicators – section 'Biodiversity'
- World Database on Protected Areas (WDPA)

G.24.8. Land cover and land use statistics

G.24.8.1. CONCEPTS AND DEFINITIONS

Land Cover/Land Use (LC/LU) information is basic information needed in many statistical fields: in agriculture statistics (covering Utilised Agricultural Area) to provide information on production areas and to estimate agricultural production, in forestry statistics (covering wood production areas) to estimate timber production (with forest inventory data), in urban statistics to calculate population density, in environment statistics to inform agri-environmental indicators, biodiversity, landscape diversity, water quality, soil quality and soil erosion etc. Further fields of application are spatial planning, urban and rural development, climate change, damage assessment in case of natural or man-made hazards etc.

LC/LU data are required at various spatial and administrative levels, i.e., local, regional, national and global. Depending on the application, the level of detail of the LC/LU classification varies from rough classifications (e.g., about 10 classes defined by the UNFCCC for reporting on Land down to more than 80 LC/LU types for biotope/habitat mapping.

Land

For land cover, the reference area is above the surface. This is not so obvious for land use, e.g., in view of complex multipurpose use of buildings (parking areas, shops, offices and apartments on different floors of the same building) or of mine deposits (is the complete underground oil field the reference area or only the well?).

Another important aspect is the consideration of inland waters within the "land" definition. Eurostat excludes inland waters from the statistical definition of the "land area" e.g., within the Demography statistics domain, due to the impact of inland water areas on indicators such as population density (e.g., 17% of the territory of the Netherlands is inland water).

In contrast, Eurostat recommends including inland waters and tidal flats in Land Cover/Land Use information. In general, the definition of the reference area ("land") needs to be taken into account when using LC/LU data from multiple different sources. Although the LU/LC methodology has been developed in a European context, it builds on general concepts and approaches. Thus, this methodology and its basic principles may be applied in any country. In particular, the issue of inland waters and tidal flats is relevant in many partner countries.

Land cover and land use

Most of the existing information on LC/LU is mixing land cover and land use. Natural and semi-natural vegetation are described in terms of land cover, while agricultural and urban areas are described in terms of land use (see the CORINE Land Cover classification).

However, these are two different issues: distinction between land cover and land use is fundamental, though often ignored or forgotten. Confusion and ambiguity between these two terms lead to practical problems, particularly when data from the two different dimensions need to be matched, compared and/or combined. An example of a clear distinction between land cover and land use is represented by the European Land Use/Cover Area frame Survey (LUCAS).

The Eurostat "Manual of Concepts on Land Cover and Land Use Information Systems" defines these terms as follows:

- **Land** cover corresponds to a physical description of space, the observed (bio-) physical cover of the earth's surface. This description enables various biophysical categories to be distinguished - basically, areas of vegetation (trees, bushes, fields, lawns), bare soil (even if this is a lack of cover), hard surfaces (rocks, buildings) and wet areas and bodies of water (sheets of water and watercourses, wetlands). Land Cover is "observed", meaning that observation can be made from various "sources of observation" at different distances between the source and the earth's surface.
- **Land Use** corresponds to the description of areas in terms of their socio-economic purpose: areas used for residential, industrial or commercial purposes, for farming or forestry, for recreational or conservation purposes, etc. Links with land cover are possible; it may be possible to infer land use from land cover and conversely. But situations are often complicated and the link is not so evident. Contrary to land cover, land use is difficult to "observe". For example, it is

difficult to decide if grasslands are "natural" (or semi-natural), and therefore not used, or if they are used for agricultural purposes. The information coming from the source of the observation may be sufficient, e.g., indications of the presence or absence of cattle, or may require additional information, for example from the land owner or the farmer.

The LUCAS manual has been designed for the European level, but its overall methodology could be applied in any other region/country of the world. The definitions of "land cover" and "land use" may need to be adapted in response to the particular situation in individual countries.

G.24.8.2. SOURCES OF DATA

There are two main approaches for collection of land cover / land use data:

1. The mapping approach: land cover/use of the 'Area of Interest' is exhaustively ("wall-to-wall") mapped on the basis of topographic or cadastral maps or aerial photographs or satellite images such as GlobCover (which covers countries worldwide, e.g., China, Mexico, Argentina, Democratic Republic of Congo, Burkina Faso and other African countries) and CORINE Land Cover. LUCAS is an area frame survey covering all EU.
2. The statistical (sampling) approach: sample of units are observed and the land cover/use estimated. These units can be selected from a list of administrative or socio-economic entities (list frame surveys) or can be represented by a portion of land – polygons, lines (transect), points (area frame surveys). Examples of list frame surveys on LC/LU in the EU are the Farm Structure Survey at EU level and AGRIT in Italy and ESYRCE in Spain at national level.

Exhaustive mapping of land cover/use is required when spatially explicit information is needed, for example in regional/physical planning or calculation of indicators on spatial patterns of a landscape (e.g., fragmentation). Land use/cover mapping can be time and cost intensive, depending on the size of the area to be covered and the level of detail in terms of land use/cover types and geometry, i.e., the scale of the resulting map.

A detailed biotope mapping of a small natural conservation area is best carried out by afield survey, for example by botanists going on the ground and mapping the areas occupied by specific plant types. Such a field survey is time consuming and cost intensive. If there are several similar biotopes within a country, surveying a representative statistical sample of such areas allows estimating the areas covered by the same type of biotope at the level of the country.

An additional method to collect spatially explicit LU/LC data is remote sensing. Energy reflected or emitted from the earth's surface is recorded by cameras or digital sensors (CCDs) mounted on airplanes, helicopters, balloons or satellite platforms, recording the energy in a multitude of bands of the electromagnetic spectrum. Satellite images cover large areas with a stable geometry, yielding easier handling of the data for geo-referencing (projecting the image onto map coordinates). Satellites fly regularly over the same area with the same specifications, making data processing a routine task and monitoring of changes much easier. The dependency of optical sensors on the weather is overcome through RADAR sensors, which can "see" through clouds. The geometric resolution of airborne digital images allows a larger mapping scale than space borne data, but the difference in resolution is decreasing. The remote sensing approach requires ground truth data for calibration.

List and area frame surveys represent a common approach to gather land cover and land use data. In contrast to mapping techniques, they provide quantitative statistical results with precision indicators attached to them. Based on the visual observation of a sample of units, estimates of the extent of land cover/use classes are computed. List frame surveys are mainly used when the scope of the analysis is a specific domain (i.e., agricultural areas). If the scope is extended to all the dimensions of LC/LU, usually the area frame approach is chosen.

The implementation of an area frame survey can go through different steps. For example, in the case of LUCAS, first a hypothetical grid is laid over the EU territory. The grid nodes are super-imposed over aerial photos and satellite images, with the land cover on these points photo interpreted and pre-classified (stratification phase) with a very broad aggregation. To obtain the necessary detailed classification and avoid errors due to photointerpretation, a sample of these points is physically surveyed on the ground. The results, which the surveyors report to the office, are combined with the outcomes of the stratification to calculate area estimates of the extent of land cover and land use classes all over Europe.

The Eurostat "Manual of Concepts on Land Cover and Land Use Information Systems" is a reference for further reading on land information methodologies, data collection approaches and survey methods.

Box G.24.9: Examples of Land Information Systems

GlobCover was an European Space Agency (ESA) initiative in partnership with JRC, EEA, FAO, UNEP, GOFC-GOLD and IGBP. The GlobCover project developed a service capable of delivering global composite and land cover maps, using as input observations from the ENVISAT satellite mission. GlobCover provided satellite data and land cover products at global and regional level according to the FAO "Land Cover Classification System (LCCS)".

The US Geological Survey (USGS), together with the US National Aeronautics and Space Administration (NASA), provides global coverage of digital satellite images from the US Landsat satellites. Based on this data, historic monitoring of land cover/use can be carried out.

The Environmental Data Explorer was the authoritative source for data used by the UNEP Global Environment Outlook (GEO) and other integrated environment assessments. Its online database holds more than 500 different variables, as national, sub-regional, regional and global statistics or as geospatial data sets (maps), covering themes like Freshwater, Population, Forests, Emissions, Climate, Disasters, Health and GDP.

The Africover Project established a digital geo-referenced database on land cover and a geographic referential for the whole of Africa, including geodetical homogeneous referential, toponomy, roads and hydrography, in the Multipurpose Africover Database for the Environmental Resources (MADE). The core strategy of Africover was to reinforce national and sub-regional capacities for establishing, updating and using geographic referential and land cover maps and spatial data bases. This methodology has been adopted to ensure an operational approach and the sustainability of the initiative. Africover was the basis for the establishment of the Global Land Cover Network (GLCN).

The European Environment Agency coordinates the CORINE Land Cover project, covering about 32 European countries. The data is photo-interpreted on the base of satellite imagery. There are currently 3 data sets available (1990, 2000 and 2006).

Eurostat collects information via its Land Use / Cover Area frame statistical Survey - LUCAS. LUCAS is a field survey, carried out on sample points spread over the entire territory of the Member States. Data on land cover and land use are collected and landscape photographs are taken, enabling detection of changes in LC/LU and in European landscapes. There are currently five datasets available (2006, 2009, 2012, 2015, 2018) while a sixth round of the survey was carried out in 2022.

To find out more…

- EEA: CORINE Land Cover, CORINE Land Cover classification
- European Space Agency (ESA): GlobCover portal
- Eurostat: LUCAS website, LUCAS methodology, Manual of Concepts on Land Cover and Land Use Information Systems
- Eurostat: statistical definition of the "land area"
- Examples of European list frame surveys: Farm Structure Survey, AGRIT, ESYRCE
- FAO: Africover, Global Land Cover Network (GLCN), Land Cover Classification System (LCCS)
- UNEP: Global Environment Outlook (GEO)
- USGS: Earth Resources Observation and Science (EROS) Center

G.24.9. Analysing data quality and identifying problems

The environment is a horizontal issue in the sense that all human activities are involved to some extent. Developing environmental indicators thus requires information related to a wide range of activity sectors.

Like all indicators, the quality of environmental indicators and statistics relies on the quality of data and statistics used as input. Generally, more than one institution or body is involved in gathering data and information necessary to establish environmental indicators; each of them is responsible for compiling information on specific activities, potential emission sources, monitoring environmental parameters etc. All these institutions, at all levels from local to national, have or should follow harmonised procedures to ensure quality and comparability of the data they are collecting as well as of the statistics they are producing.

Good quality and reliable indicators should meet some basic and inter-related criteria:

- Use of international statistical standards. The UN System of environmental economic accounting is a framework that integrates economic and environmental data to provide a more comprehensive and multipurpose view of the interrelationships between the economy and the environment and the stocks and changes in stocks of environmental assets, as they bring benefits to humanity. It contains the internationally agreed standard concepts, definitions, classifications, accounting rules and tables for producing internationally comparable statistics and accounts. The SEEA framework follows a similar accounting structure as the System of National Accounts (SNA). The framework uses concepts, definitions and classifications consistent with the SNA in order to facilitate the integration of environmental and economic statistics. The SEEA is a multi-purpose system that generates a wide range of statistics, accounts and indicators with many different potential analytical applications. It is a flexible system that can be adapted to countries' priorities and policy needs while at the same time providing a common framework, concepts, terms and definitions.
- Representativeness and completeness: the indicator integrates all input data needed in terms of e.g., spatial and time coverage. For example, emission inventories will cover all SNAP sectors. Collecting adequate and precise information on the sampling/monitoring location is therefore of utmost importance in order to evaluate results.
- Consistency and coherence: the environmental indicator should be meaningful and should not be in contradiction with other related indicators or statistics. For example, the water losses indicator should be consistent with those on freshwater abstraction and on water usage, and the ambient air concentration for one pollutant should be consistent with the corresponding emission indicator.
- Comparability: this is ensured by using similar and harmonised definitions and methodologies at the national level but also in line with international standards. The use

of standardized methods as far as feasible (depending on costs and complexity) ensures not only data quality as explained above, but also comparability of results both within a country and internationally. For example, national definitions of hazardous waste may change over time, as national legislation is revised. Therefore, the definition of hazardous waste varies greatly from one country to another, and sometimes also over time.

- Traceability: reliable and full documentation is of utmost importance when updating or repeating an exercise, e.g., for another year in order to allow trend analysis. Lacking traceability and documentation may limit data quality and comparability.

G.24.10. Improving sector statistics

As mentioned earlier, more than one institution is possibly involved in monitoring and in producing indicators. In many countries, however, there is no or not a fully developed structure to manage environmental information. A first step would then be to set up a structure responsible for collating and compiling environmental information.

The structure must comprise for each environmental sector (air, water, waste ...) all institutions or bodies in charge of:

- generating the necessary information and data (including those carrying out monitoring of environmental parameters);
- collating and compiling information and data.

The responsibilities must be clearly identified in terms of area(s) of competence (including international commitments) and duties. These bodies may not have experience in working together and/or authority of sharing information. Therefore, coordination and connection channels will be established, if necessary, in order to ensure effective data and information sharing. This may require the development of memoranda of understanding and even in some cases the amendment of legal instruments ruling the functioning of public services.

Another critical issue is to identify the indicators which need to be generated. There are hundreds of environmental indicators in use across the world. In practice it is not realistic or even necessary to generate all of them. The competent authorities must decide on priority indicators, taking into account:

- the national geographical context;
- main environmental issues at stake in the country;
- data and information readily available and those that are envisaged for the near future;
- available human and financial resources and constraints.

A comprehensive set of environmental indicators that can be used as a reference are the indicators maintained by the EEA. These indicators are grouped by theme/sector, and are designed to inform key policy questions and support all phases of environment policy making. They support the design of policy frameworks, guide the setting of targets, and are used for monitoring and evaluation of environment polices and for communicating on priorities, progress and results. The EEA's Core Set of Indicators (CSI) comprises key indicators, drawn from the dedicated indicator sets for specific topics: Climate state and impact indicators (CLIM); Air indicators (AIR); Waste indicators (WST), (Water indicators (WAT); Water resource efficiency indicators (WREI); Marine indicators (MAR); Streamlining European biodiversity indicators (SEBI); Land and soil indicators (LSI); Transport and environment reporting mechanism (TERM); Energy indicators (ENER), and; Industrial Pollution indicators (INDP). These indicator sets, maintained by the EEA, are detailed in Box G.24.11.

Box G.24.10: European Commission: Environmental Integration Handbook for European Commission Development Co-operation

The European Commission's "Environmental Integration Handbook for EC Development Co-operation" provides an introduction to the rationale and concepts for environmental integration. It outlines an operational framework covering the three main aid delivery modalities. To enhance the efficiency of development activities, it is crucial to consider environmental issues already when preparing the Country Strategy Paper (CSP). In addition, the National Indicative Programme (NIP) also has to address this topic.

In order to adequately inform this process, the key tool is the Country Environmental Profile (CEP). The CEP is a report that contains a description and broad assessment of a country's environmental situation, policy and regulatory framework, institutional capacities and environmental co-operation. The CEP is primarily meant to facilitate the integration of the environmental dimension in the country analysis, response strategies and multiannual programming. The CEP should also be used to underpin policy dialogue.

The Handbook provides an example of Terms of Reference for developing a CEP (Annex 2). However, whereas the Handbook defines the key areas that should be covered by the CEP, it does not define specific indicators. In this process, existing indicators and methodologies should be applied as far as possible. The EEA sets of environmental indicators, presented in Box G.24.11, could be used as reference and basis.

Source: Environmental Integration Handbook for EC Development Co-operation

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Box G.24.11: EEA indicator sets

CSI (Core Set of Indicators)

- Abundance and distribution of selected European species
- Use of freshwater resources in Europe
- Share of renewable energy in gross final energy consumption in Europe
- Energy intensity in Europe
- Passenger and freight transport demand in Europe
- Landscape fragmentation pressure and trends in Europe
- Land take in Europe
- Waste recycling
- Waste generation in Europe
- Exposure of Europe's population to environmental noise
- Hazardous substances in marine organisms
- Industrial pollution in Europe
- Emissions of the main air pollutants in Europe
- Chlorophyll in transitional, coastal and marine waters
- Nutrients in transitional, coastal and marine waters
- Fishing fleet pressure
- Status of marine fish stocks
- Nationally designated protected areas

CLIM (Climate state and impact indicators)

- Meteorological and hydrological droughts in Europe
- River floods
- Forest fires
- Heavy precipitation in Europe
- Heating and cooling degree days
- Mean precipitation
- Hail
- Wind storms
- Water- and food-borne diseases
- Water-limited crop yields
- Agrophenology
- Crop water demand
- Growing season for agricultural crops
- Extreme temperatures and health
- Floods and health
- Vector-borne diseases
- Forest composition and distribution
- Phenology of plant and animal species
- Distribution shifts of plants and animal species
- Water temperature
- River flow
- Distribution shifts of marine species
- Ocean heat contents
- Glaciers
- Snow cover
- Air pollution due to ozone: health impacts and effects of climate change

AIR

- Heavy metal emissions
- Persistent organic pollutant emissions
- Emissions of the main air pollutants in Europe

WST (Waste indicators)

- Diversion of waste from landfill
- Waste recycling
- Waste generation in Europe

WAT (Water indicators)

- Use of freshwater resources in Europe
- Water intensity of crop production in Europe

WREI (Water resource efficiency indicators)

- Use of freshwater resources in Europe

MAR (Marine indicators)

- Changes in fish distribution in European seas
- Pathways of introduction of marine non-indigenous species to European seas
- Hazardous substances in marine organisms
- Chlorophyll in transitional, coastal and marine waters
- Nutrients in transitional, coastal and marine waters
- Aquaculture production in Europe
- Marine protected areas in Europe's seas
- Fishing fleet pressure
- Status of marine fish stocks

SEBI (Streamlining European biodiversity indicators)

- Natura 2000 sites designated under the EU Habitats and Birds Directives
- Abundance and distribution of selected European species
- Ecological footprint of European countries
- Public awareness of biodiversity in Europe
- Agriculture: nitrogen balance
- Ecosystem coverage
- Forest: growing stock, increment and fellings
- Freshwater quality
- Forest: deadwood
- Nationally designated protected areas
- Agriculture: area under management practices potentially supporting biodiversity
- Red List index for European species

Continues to next box >

- Nutrients in transitional, coastal and marine waters
- Livestock genetic diversity
- Invasive alien species in Europe
- Impact of climate change on bird populations
- Financing biodiversity management
- Critical load exceedance for nitrogen
- Aquaculture: effluent water quality from finfish farms

LSI (Land and soil indicators)

- Imperviousness and imperviousness change in Europe
- Landscape fragmentation pressure and trends in Europe
- Land take in Europe
- Soil moisture
- Progress in management of contaminated sites
- Soil organic carbon

TERM (Transport and environment reporting mechanism)

- Passenger and freight transport demand in Europe
- Final energy consumption in Europe by mode of transport
- Exceedances of air quality limit values due to traffic
- Emissions of air pollutants from transport
- Size of the vehicle fleet in Europe
- Transport fuel prices and taxes in Europe
- Real change in transport prices by mode
- Exposure of Europe's population to environmental noise
- Investment in transport infrastructure

ENER (Energy indicators)

- Primary energy consumption by fuel in Europe
- Share of renewable energy in gross final energy consumption in Europe
- Energy intensity in Europe
- Intensity of final energy consumption in Europe
- Progress on energy efficiency in Europe
- Efficiency of conventional thermal electricity and heat production in Europe
- Final energy consumption by sector and fuel

INDP (Industrial Pollution indicators)

- Emissions of air pollutants from large combustion plants in Europe
- Large combustion plants operating in Europe
- Industrial pollution in Europe
- Industrial waste in Europe

Source: European Energy Agency (EEA) website

G.24.10.1.ENVIRONMENTAL ACCOUNTING

The environment has an important impact on every economy and has to be considered in the context of globalisation. Environmental accounting is an indispensable tool to measure the role played by the natural environment in the economy. It should highlight both the contribution of natural resources to economic well-being and the costs of pollution and resource degradation. Environmental accounts are designed as "satellite accounts" to accompany the System of National Accounts (SNA). However, they show results in monetary terms only in a few cases. In general, environmental accounts are divided into the following sections:

- Monetary environmental accounts;
- Physical environmental accounts;
- Ecosystem accounts.

At EU level, environmental accounting has been endorsed into the Statistical Programme in 2003 and has its legal basis in Regulation (EU) No 691/2011 on European environmental economic accounts. An expansion of environmental accounts statistics with high quality, reliability and timeliness is also embedded in the European Strategy for Environmental Accounts 2019-2023. A new Strategy for 2024-2028 is in preparation.

A condition for the collection of these statistics is a sound methodology for the collection of national accounts data and the availability of the main datasets for national accounts (please refer also to chapter F.17, which discusses National accounts in detail). Based on these data, partner countries may follow the European Union's approach and prepare data for the indicators which can be derived from the national accounts system. These are environmental (protection) expenditure and investment by the public and by economic sectors, as well as environmental tax revenues.

To find out more…

- System of Environmental-Economic Accounting (SEEA)
- Eurostat: Environmental accounts - establishing the links between the environment and the economy (Statistics explained article)
- Regulation (EU) No 691/2011 on European environmental economic accounts
- European Commission: Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL amending Regulation (EU) No 691/2011 as regards introducing new environmental economic accounts modules
- Eurostat: Environmental statistics methodology

G.24.10.2. CLIMATE CHANGE

Climate change refers to a change in climate patterns due to human activities, going beyond the natural variability in the climate. This is caused by greenhouse gases emitted into our atmosphere. Among the drivers of these emissions are the burning of fossil fuels, industrial processes, livestock farming, and waste treatment.

The direct impacts which we experience include an increase in the global temperature, rising sea levels and more extreme weather conditions. These impacts have subsequent wide-ranging effects on ecosystems, the economy, society and human health. We have to deal with the consequences while trying to counter the causes of climate change. Climate change-related statistics can help us to understand this whole process better.

The availability of high-quality information is essential for monitoring progress in reducing greenhouse gas emissions, as well as for analysing the drivers, impacts and adaptation to climate change. It is essential to continually monitor and

report these data to keep track of progress towards the goals set out in international climate policies.

International recommendations published by the Conference of European Statisticians call for improvements to existing statistics relevant to climate change analysis and access to them.

A collection of statistics from various domains is needed, that will help better understand, analyse and monitor climate change. Eurostat, for instance, publishes in its climate change section statistics on the drivers, emissions, impacts as well as mitigation and adaptation measures related to climate change:

- **Drivers** are human activities that cause climate change. They include economic activities, such as electricity production or cutting down trees, but also leisure activities, such as car journeys.
- Emissions related to climate change are **emissions of GHG**, which are so named because they trap heat in our atmosphere.
- Climate change **affects** humans and the environment.
- Climate change **mitigation** refers to activities undertaken to reduce or offset GHG emissions, such as increasing carbon sinks.
- Climate change **adaptation** includes specific actions to help communities and ecosystems better cope with, or even benefit from, climate change.

To find out more…

- Convention on Biological Diversity (CBD)
- DG International Partnerships: Environmental Integration Handbook for EC Development Co-operation
- EEA: EEA Indicators, 'Environmental indicators: Typology and overview'
- European Environment Information and Observation Network (EIONET)
- Eurostat: Environment statistics and environmental accounts, Sustainable Development Goals (SDG) indicators
- International Standard Industrial Classification of All Economic Activities (ISIC)
- OECD: Environment, Environment statistics, Environment at a Glance
- Statistical Classification of Economic Activities in the European Community, Rev. 2 (NACE Rev. 2)
- United Nations Environment Programme (UNEP)
- UNECE: Environmental monitoring and assessment, environmental indicators, 'Environment for Europe' process, Guidelines for the Application of Environmental Indicators
- UNSD: Environment statistics, Environmental indicators, SDG global database
- World health Organization (WHO): Environment and health information system (ENHIS)

To find out more about statistics on climate change

- Eurostat: statistics on Climate change
- Conference of European Statisticians: Recommendations on Climate Change-Related Statistics, CES Set of Core Climate Change-Related Indicators and Statistics Using SEEA, Implementation Guidelines for the CES Set of Core Climate Change-Related Indicators and Statistics Using SEEA

G.25 Energy statistics

G.25. Energy statistics

The chapter in brief

Global energy consumption has grown tremendously over the past decades and is expected to keep increasing considerably, as the demand in developing economies ramps up. Meanwhile, the undesirable side-effects of energy consumption on the health of populations and on the environment emphasize the need for a precise monitoring of energy use.

This chapter covers a wide area of national energy statistics and a variety of energy products, including fossil fuels and renewable energy sources. It lists several applications of energy statistics, such as policy making, as well as international reporting obligations and the various stakeholders involved at the national, regional and global level. It also provides an overview of the internationally agreed methodology. Various potential sources for data at the national level are presented, as well as specific guidance for data collection issued by international organisations. The chapter also includes a quick summary of the main aspects to consider in the quality assessment process, and concludes with some recommendations on how to build or improve energy statistics collection and dissemination in partner countries.

G.25.1. Policy applications: what energy statistics are used for

With an ever-growing global demand for energy, governments, NGOs and many other stakeholders are in need of accurate monitoring of energy supply, trade, storage, transformation and consumption.

Energy is at the centre of economic development, because of its potential applications and because of the associated investment requirements.

- In its primary form, such as fuelwood, energy can provide access to the most basic needs such as cooking food and providing heating, hot water and lighting.
- In its more advanced forms, such as electricity or refined fuels, energy can provide access to the same primary needs in a more convenient way, and also to other services such as preserving food, cooling buildings, enabling information exchange and communication, education, health services, entertainment, and physical transport of goods and people within and between countries.
- Finally, thanks to its capacity to provide heat and to power machinery, energy is required in all economic sectors, including the manufacturing industry, construction, agriculture etc.

Energy is also related to a range of negative impacts on people and on the environment.

- The combustion of fuels is known to cause health issues, due to local pollution, such as release of toxic substances, emissions of micro-particles etc. The World Health Organization (WHO) estimates that 7 million people die each year from exposure to polluted air. Many of these mortalities (3.8 million in 2016) are attributable to household air pollution from cooking with polluting fuels and technologies. This represents more deaths per year than from car accidents.
- Energy also entails social issues linked to cost and access. For instance, in the rural populations of partner countries, the time-consuming task of gathering fuelwood is often assigned to women and children.
- There are also wider economic concerns regarding the availability of energy at the global level, the rights to extract it, the remaining reserves, the volatility of the market prices, conflicts linked to the access to energy sources and the dependency of some nations on external sources of energy supply.
- Some international organisations require their member states to hold a certain amount of oil stocks in order to ensure supply security in case of disruption. In accordance with the Agreement on an International Energy Programme (IEP), all of the International Energy Agency (IEA) member countries have an obligation to hold emergency oil stocks equivalent to at least 90 days of net imports of the previous calendar year. This covers all petroleum, including both primary and refined products. In case of a severe oil supply disruption, IEA members may decide to release these stocks to the market as part of a collective action.
- Similarly, under the oil stocks directive (2009/119/EC), EU Member States must maintain emergency stocks of crude oil and/or petroleum products equal to at least 90 days of net imports or 61 days of consumption, whichever is higher. During a supply crisis, the European Commission is responsible for organising a consultation between EU Member States and deciding on the course of collective actions.
- Last but not least, environmental concerns associated with energy have been at the basis of international discussions during the last few decades. Human emissions of carbon dioxide (CO2) and other greenhouse gases (GHG) are a primary driver of climate change. According to the Joint Research Centre (JRC), in 2019 36 % of global CO2 emissions were related to the power industry and 22 % to other industrial combustion. Another 22 % of the CO2 emissions originated from the transport sector, while buildings and other sectors (including agriculture) represented 9 % and 11 % respectively.

To address these issues, precise monitoring of energy extraction, trade, transformation and final consumption is necessary. Developing and improving energy statistics, either through regional organisations or national administrations, requires the implementation of the relevant international standards and methodologies.

- Complete energy statistics allows the preparation of energy balances. An energy balance is an accounting framework for the compilation and reconciliation of data on all energy products entering, exiting and used within the national territory of a given country during a reference period.

- An exhaustive and accurate picture of the energy situation in a region or individual country is required to plan and monitor projects and policies. For instance, energy models can only provide useful information on the future consequences of today's decisions if the base data accurately represent the current energy system.
- Moreover, energy balances are the basis for further data work, including the calculation of energy efficiency indicators and GHG emissions estimates. On top of their informative value for the regional organisations and national administrations, these figures are used to track progress toward the Sustainable Development Goals.
- In particular, the internationally agreed methodologies and definitions for energy statistics are aligned with the GHG inventories guidelines from the International Panel on Climate Change (IPCC), so that for example default emissions factors for each product can be applied to the energy data collected.
- Several international and regional organisations are collecting national energy statistics from their member countries, including the European Union (EU), the International Energy Agency (IEA), the International Renewable Energy Agency (IRENA), the African Energy Commission (AFREC), the Organization of the Petroleum Exporting Countries (OPEC), the United Nations (UN), the Latin American Energy Organization (OLADE), the Asia-Pacific Economic Cooperation (APEC) and others.
- Dedicated international platforms have also been created for countries and organisations to collaborate on the topic of data collection methodology and transparency.
- The Oslo Group was created by the UN Statistical Commission to contribute to improved international standards and methods for official energy statistics. It was established in 2005, and members include energy statisticians from national statistical offices, from energy ministries and from international organisations, as well as experts from academia and the private sector.
- The Intersecretariat Working Group on Energy Statistics (InterEnerStat) aims at enhancing coordination and collaboration to improve the availability and quality of international energy statistics, without increasing the response burden on countries and by making best use of resources.
- The International Energy Forum (IEF) gathers six international Organisations (APEC, Eurostat, OLADE, OPEC and the UN), who have agreed to share data in a transparent and timely manner. The initiative was founded in 2002 and, and although it initially targeted only oil market information, natural gas data were added to the initiative in 2013. Aside from gathering data from the different organisations and disseminating them on the Joint Organisation Data Initiative (JODI) World database, the IEF also organises training programmes for data providers at national administrations and in energy companies who collect and submit the data.

Preparing energy data in line with the reporting obligations of the various stakeholders has required nations to put in place specific arrangements within their administrations, often including both the energy ministry and the national statistical office.

Box G.25.1: Energy in the African Union's Agenda 2063

Point 72 of the declaration of the African Union's agenda 2063 is specifically referring to Energy:

"We hereby adopt Agenda 2063, as a collective vision and roadmap for the next fifty years and therefore commit to speed-up actions to […] connect Africa through world-class Infrastructure, including interconnectivity between island states and the mainland, and with a concerted push to finance and implement the major infrastructure projects in […] harnessing all African energy resources to ensure modern, efficient, reliable, cost-effective, renewable and environmentally friendly energy to all African households, businesses, industries and institutions, through building the national and regional energy pools and grids, and PIDA (Program for infrastructure development in Africa) energy projects."

Please note that statistics on emissions are discussed in detail in chapter G.24.

G.25.2. Concepts and definitions in energy statistics

The United Nations Statistics Division (UNSD), together with Eurostat, international organisations and representatives from different countries developed the International Recommendations for Energy Statistics (IRES)[1], which provide the methodological framework for the collection, compilation and dissemination of energy statistics.

The first milestone in the development of IRES was the adoption of the Standard International Energy Product Classification (SIEC), which is the first standard classification for energy products. It provides a set of internationally harmonised definitions for energy products and links to other internationally agreed product classifications, such as the Central Product Classification (CPC), the International Standard Industrial Classification of All Economic Activities (ISIC) and the Harmonized Commodity Description and Coding System (HS). Details about the last three classifications may be found in chapter B.5.

IRES also provides of a set of internationally agreed recommendations covering all aspects of the statistical production process, from the institutional and legal framework, basic concepts, definitions and classifications to data sources, data compilation strategies, energy balances, data quality issues and statistical dissemination.

The target audience of IRES comprises compilers of national statistics, policymakers, international and regional organisations dealing with energy-related issues, research institutions and energy analysts, and the general public.

1 IRES was prepared by UNSD in close cooperation with the Oslo Group on Energy Statistics and the Intersecretariat Working Group on Energy Statistics (InterEnerStat). Consultations with specific groups of experts, such as the Committee of Experts on Environmental-Economic Accounting, the Expert Group on International Economic and Social Classifications and the London Group on Environmental Accounting, took place during the preparation process.

Following the adoption of IRES, the IEA and Eurostat have together developed the 'Energy statistics manual', which provides all definitions and best practices for proper energy statistics reporting.

Additionally, the IEA has developed the 'Energy efficiency indicators: fundamentals on statistics' manual for statisticians, which covers all the different practices to collect and a methodology to report energy end-use and activity data to calculate energy efficiency indicators.

Energy data are often collected in the format of a commodity balance, which records the main steps that an energy commodity will go through between its extraction and its final use. The commodity quantities are measured in the same units across the entire chain. These steps include:

- Production of energy commodities: for example, extraction of primary fossil fuels, generation of primary electricity, heat from renewable or nuclear sources.
- Trade: international imports and exports of energy commodities. Note that fuels used in international marine bunkers and international civil aviation are reported separately. The main reason for that is that, following the United Nations Framework Convention for Climate Change (UNFCCC) guidelines, emissions associated with this consumption are excluded from national inventories and added as a separate element in the world total.
- Stock changes: difference in the level of stocks of the energy products between the start and the end of the reporting period.
- Transformation: conversion (physical and/or chemical) of an energy commodity from its primary form into a secondary form that is useful for its intended application. This includes, among others, crude oil refining and coal combustion for electricity and heat.
- Final consumption: records the consumption of energy commodities in all sectors of the economy. This use can be for energy purposes (e.g., heat, operation of machinery through fuel or electricity) or non-energy use (e.g., lubricants, steel processing)

Aside from the commodity balances, some other information is often collected, such as:

- Electricity generation capacity
- Refinery capacity
- Stock levels at the start and at the end of the period

Box G.25.2: Data collections for energy statistics in the EU

Main legal acts on energy statistics:

- Regulation (EC) No 1099/2008 of the European Parliament and of the Council of 22 October 2008 on energy statistics
- Regulation (EC) No 223/2009 of the European Parliament and of the Council of 11 March 2009 on European statistics
- Regulation (EU) 2016/1952 of the European Parliament and of the Council of 26 October 2016 on European statistics on natural gas and electricity prices

Data collection (several questionnaires are joint IEA/UNECE/ Eurostat questionnaires)

- Annual questionnaires:
  - six questionnaires: electricity and heat; natural gas; oil and petroleum products; solid fuels (coal); renewables and wastes; nuclear.
  - moreover, Eurostat collects annual data via other questionnaires: disaggregated final energy consumption in households, disaggregated final energy consumption in industry, combined heat and power generation, district heating and district cooling.
  - additional data collections are being developed (e.g. disaggregated energy consumption in services and for transport activities, biomass).
- Monthly questionnaires: oil and petroleum products; natural gas; electricity; coal.
- Half-yearly questionnaires: energy prices (electricity and natural gas), broken down by households / non households.

Details on these questionnaires and data collections can be found on Eurostat's website in the dedicated section on Energy statistics, in the sub-section on Methodology.

Box G.25.3: Forthcoming annual data collection on hydrogen in the EU

Hydrogen manufactured from renewable sources has attracted interest as a potential component of a sustainable mix of fuels.

For instance, in 2022, hydrogen accounted for less than 2% of the EU's energy consumption and was primarily used to produce chemical products, such as plastics and fertilisers. 96% of this hydrogen was produced with natural gas, resulting in significant amounts of CO2 emissions. The priority for the EU is to develop renewable hydrogen and it aims to produce 10 million tonnes and import 10 million tonnes by 2030. The EU's hydrogen strategy and REPowerEU plan have put forward a comprehensive framework to support the uptake of renewable and low-carbon hydrogen to help decarbonise the EU in a cost-effective way and reduce its dependence on imported fossil fuels. For more information, please refer to the European Commission's 'Hydrogen' website, listed in the 'To find out more' section of the chapter.

Responding to the increased importance of hydrogen, Eurostat, in collaboration with the IEA and the UNECE have developed an annual questionnaire on hydrogen. It is similar to the other annual joint questionnaires mentioned in box G.25.2. More specifically, as stated in the respective reporting instructions, the definitions and reporting conventions used in this questionnaire are the same as those used in the annual questionnaires on oil and petroleum products, on coal, on natural gas, on renewables and wastes, and on electricity and heat. Besides its joined use by Eurostat, the IEA and the United Nations Statistics Division, the questionnaire may also be adopted by other international organisations.

The obligation of EU Member States to report data annually has been included in Commission Regulation (EU) 2022/132 of 28 January 2022 amending Regulation (EC) No 1099/2008. The first compulsory reference year is 2024 but Member States are invited to also submit data for 2022 and 2023.

The reporting instructions for the hydrogen questionnaire can be found on Eurostat's website in the dedicated section on Energy statistics, in the sub-section on Methodology.

G.25.3. Sources of energy data and metadata

At the national level, energy statistics are collected from various sources:

- Supply information is available from energy producers, regulators, and other energy industry actors (e.g., refineries, transmission and distribution operators).
- Trade amounts can be obtained from customs offices and trade associations.
- Energy use can be obtained from the different consumers, mainly industries and households.

These statistics are collected via different types of data collection:

- Surveys are used to collect data from enterprises (consumption and sales data) and households (end use surveys). They can be either dedicated to the energy topic (see Box G.25.4) or a module can be added as part of the general household survey (see Box G.25.5)
- Administrative data can be gathered from energy regulators, customs offices, tax offices, ministries (e.g., for data collected from programme/policy implementation) and industry and trade associations, chambers of commerce, vehicle registration authority (see Box G.25.6) etc.
- Direct measurements are also possible e.g., for electricity via conventional and smart meters or sub-meters (on appliances) in the industry, and in public, commercial and residential buildings.
- When data collection is not possible, estimation or modelling can be used, for example in order to infer photovoltaic electricity generation based on the installed capacity (see Box G.25.7), or to project the consumption based on economic models.

Box G.25.4: IRENA biogas survey

Many governments have launched national biogas programmes, aiming to promote and facilitate the use of household digesters in order to produce biogas to be used for cooking and lighting. Ensuring an accurate accounting of the use of biogas is vital to monitor the projects and policies, to assess the environmental impact and to track progress towards the sustainability targets.

IRENA has published the field guide 'Measuring small-scale biogas capacity and production', which presents various methodologies for estimating biogas capacity, production, and consumption. The material proposed can be integrated into national censuses, household surveys and energy surveys.

Different methodologies are presented for estimating biogas production, based on either direct measurement, plant capacity, appliance use, feedstock use or by comparing fuel use in households with and without a biogas plant (the fuel substitution method). The advantages and disadvantages of each method are also compared. For each of these methods, the data collection required is described, as well as the calculation methodology. The resulting production figures can then be used to assess the impact of the biogas use, such as reduction in fossil fuel consumption and GHG emissions.

Plant capacity:

1. Have you used your biogas plant in the last year (Yes/No)?
2. What is the main type of waste that this plant is designed to use (cattle/poultry)?
3. How much gas is the plant designed to produce each day (m^3/day)?
4. Indicate the type of biogas plant that is being measured:
   - Fixed dome plant (hemisphere)
   - Fixed dome plant (Deenbandhu)
   - Fixed dome plant (Chinese design)
   - Floating drum plant
   - Balloon/bag digester
   - Non-standard design (go to Q3)
5. Write in the dimensions of the biogas plant (cm):
   - Diameter
   - Digester height (floating drum)
   - Gas holder height (floating drum)
   - Length (balloon/bag digester)
6. If non-standard design, sketch the plant and show the main dimensions

The guidance also indicates how data collectors can measure these dimensions in the field and how they can be used to calculate plant volume for each of the main types of biogas digester.

Appliance use

1. Do you use any biogas lamps (Yes/No)? (tick one)
2. What is the average power rating of each lamp (l/hour or Watts)?
3. On average, how many hours per day do you use each lamp (hrs/day)?
4. What is the power rating of each burner on your biogas stove (l/hour or Watts)?
5. On average, how many hours per day do you use each burner for cooking and boiling water (hrs/day)?
6. Do you also burn excess biogas (Yes/No)?
7. On average, how many hours per day do you use each burner to burn excess biogas (hrs/day)?

Examples of appliance power ratings are given in order to calculate the annual biogas consumption of households.

Feedstock use

1. Do you feed the digester with waste from any of the following animals (number)?
   - o Buffalo
   - o Cows
   - o Calves
   - o Sheep/goats
   - o Pigs
   - o Hens
   - o Horses
   - o Humans
2. How much of the following types of waste do you usually add to the digester each day (kg/day)?
   - o Cereals/grains
   - o Rice straw
   - o Wheat straw
   - o Grass
   - o Corn stalk
   - o Fruit waste
   - o Vegetable waste
   - o Fats
   - o Mixed food waste
   - o Mixed organic waste
3. When you feed the digester, how much water do you add compared to the amount of waste?
   - o Half as much water
   - o An equal amount of water
   - o Twice as much water
   - o Three times as much water
   - o Over three times as much water

The average feedstock properties of animal and vegetal wastes are provided, in order to estimate the resulting biogas production.

Fuel use

How much of the following types of fuel do you use for cooking each day (kg/day or litres/day)?

- o Fuelwood
- o Charcoal
- o Kerosene
- o Bottled gas (LPG)

The standard energy contents for the replaced fuels are provided, which allow to estimate the equivalent volume of biogas used.

Finally, questions regarding information on the financial and technical performance of the biogas plant are proposed, which allow assessing the effects of the technology penetration in terms of energy access and socioeconomic impacts.

This field guide can be completed with another publication, gathering the 'Lessons learned in six countries: testing IRENA's biogas survey guidelines'.

Box G.25.5: FAO Woodfuel Supplementary Module

Woodfuel still plays a critical role for cooking in many partner countries, but it also has negative impacts on the health of the population and on the environment. This explains the need for reliable data for estimating the patterns and trends of woodfuel consumption and production, which are often lacking in the countries concerned. Because of this, wood energy is commonly neglected in national policies.

Because conducting surveys specifically on energy consumption is often not an affordable option for partner countries, FAO has published the 'Guidelines for the incorporation of a woodfuel supplementary module into existing household surveys in developing countries' for the Woodfuel Supplementary Module (WSM) tool. The WSM has been designed to collect reliable and comparable data on woodfuel production and consumption across the world.

The tables for the WSM are provided and can either be used directly or adapted to the specific situation of the country.

The WSM is designed to collect information on the consumption, acquisition, production and sale of woodfuel in the household sector and the informal sector. Data from these sectors are often missing from the data provided by partner countries to international organisations.

Specifically, the WSM covers the following topics:

- fuelwood use, collection and sales;
- charcoal use, production and sales;
- cooking and heating;
- health problems

It describes the indicators that can be built using the data gathered through the WSM, including a number of indicators from the SDG monitoring framework. Recommendations for data dissemination are also provided, to be defined based on the priorities and statistical needs of each country.

Box G.25.6: GIZ Establishing In-Use Vehicle Stock and Vehicle Mileages

In some countries, establishing the road fuel consumption of passenger cars and motorbikes from the official fuel sales figures may be impossible. The reasons may be a lack of reliable data, a large share of consumers refuelling abroad, or the presence of a strong black market for fuel. In any of these cases, an alternative secondary approach might be to calculate this consumption based on the following methodology.

$$\text{Total consumption (litres)} = \sum \text{vehicle stock}_i * \text{average vehicle mileage i (km)} * \text{fuel consumption i (litres/km)}$$

where

vehicle stock$_i$ = stocks of vehicles in use in the category

average vehicle mileage$_i$ = average mileage over the given period (e.g. year) of vehicles in use in the category

fuel consumption$_i$ = average fuel consumption of vehicles in use in the category

The average fuel consumption by type of cars can be obtained from the car specifications, and must be corrected for real driving conditions in the country. Vehicle stocks and average mileage can prove to be more difficult to estimate. In the paper 'Approaches for establishing in-use vehicle stock and vehicle mileages', GIZ has collected approaches that can be used in developing countries to assess these figures.

Vehicle stocks

Passenger cars

In most countries, a vehicle register exists. However, in developing countries it often contains most of the vehicles that have ever been registered, as vehicle owners rarely unregister their vehicles if they have no incentive to do so.

Two approaches may be used to estimate the actual number of passenger cars still in use:

- **Through the vehicle inspection data:** cars that do not show up for the compulsory regular inspection can be identified in the register as vehicles that are not in use. This approach requires:
  1. linking information from the vehicle inspections with the vehicle register;
  2. introducing a new variable/indicator for each individual entry in the vehicle database, indicating whether the car is in use or not.
- **Through secondary data sources**: such as:
  - household surveys;
  - living standard / income and expenditure surveys might contain information on the ownership of durable goods, among them cars and two-wheelers, as well as expenditure for fuel;
  - insurance information: how many vehicles (cars) are insured?
  - tax information: for how many vehicles (cars) is tax being paid?

To obtain the breakdown of vehicles in use by characteristics (e.g. type of fuel), the entire passenger car register should be amended by eliminating an appropriate number of old vehicles (based on the number of in-use vehicles identified above).

Two-wheelers

In many countries, there is no requirement for two-wheelers to undergo regular vehicle inspections, and often no national two-wheeler register exists. Sometimes two-wheeler registrations are administered by the road traffic police, and these data may be available. If they are not, household surveys remain the most likely solution.

How to establish vehicle stocks based on household surveys

Scaling up figures for a total (e.g. national) fleet from a survey sample requires reliable statistics on either the total number of households or the total population. To perform the scaling, the following should be done:

1. compute the number of vehicles per household/per person based on the household survey sample;
2. multiply the number of vehicles per household/per person by the total number of households/persons in the country.

If household datasets are used, expansion factors are used to counter survey selectivity:

$$\text{Total national vehicle fleet} = \sum NV_i \times W_i$$

where

NV_i is the number of vehicles of household i in the survey, and

W_i is the expansion factor of household i

It is also important to avoid double counting of vehicles in surveys. A possible solution is to formulate the question appropriately, for example: "How many vehicles are registered on individuals living in your household?"

Vehicle mileage

Passenger cars

Again, two main approaches can be used to estimate the average mileage per vehicle, in each category.

- **Through the vehicle inspection data**: (most reliable solution). This requires that the following information is collected at the inspection:
  - the mileage on the odometer from the vehicles;
  - the technical characteristics of the vehicle (age, fuel, type of powertrain).

  In order to extrapolate the average mileage for each vehicle group, two sub-approaches are possible:
- **Longitudinal vehicle inspection data** (most precise and reliable option): This consist in applying the following steps:
  1. Link the information from inspections to the vehicle in the register (e.g. through a unique vehicle identification number).
  2. Use the mileages from consecutive vehicle inspections to monitor the mileage trend for each vehicle category over time.
  3. Extrapolate the total mileages and average mileages per passenger car in each category.
- **Cross-sectional vehicle inspection data**: (if direct linkage of vehicle inspection data to vehicle data in the register is not possible). This implies the following steps:
  1. Collect all required technical information at the inspection.
  2. Extrapolate the overall average annual mileages.
- **Through surveys:** (if drawing mileages for passenger cars from inspections is not possible). Several options are possible:
  - household mileage survey;
  - household travel survey:
  - on-street or intercept survey.

Two-wheelers

For the same reasons as for the fleet size, mileages can often only be collected through a survey on a random sample of households, or by on-street or intercept surveys.

How to conduct a household mileage survey

1. A sample of households is drawn, e.g. by random-route-walking.
2. Households are interviewed about their socio-economic characteristics and vehicle ownership (two-wheelers, cars and others).
3. Technical details of the vehicles are recorded:
   - self-estimated annual, monthly or weekly vehicle mileage
   - a cross-sectional odometer reading (km on odometer) on a given date
   - repeated odometer readings, e.g. if the household is revisited after an adequate period of time (e.g. two months, 10 weeks).

This survey format requires reliable odometers. This should be tested with a suitable sample size of vehicle beforehand.

This method can also be combined with cross-sectional vehicle inspection data as it can deliver useful additional information to calibrate the extrapolation method.

How to conduct a household travel survey:

1. A sample of households is drawn, e.g. by random-route-walking.
2. Households are interviewed about socioeconomic characteristics and vehicle ownership (two-wheelers, cars and others).
3. Multimodal travel information is recorded through a travel diary that differentiates the driver and passenger mode for cars and for two-wheelers.

This survey could also be combined with the household mileage survey.

How to conduct an on-street or intercept survey: as an alternative or supplement to a household survey, this can be implemented the quickest and deliver data the fastest: However, it provides less reliable data.

1. Drivers are stopped on the street or approached at suitable locations (e.g. gas stations) and interviewed on site.
2. Questionnaires cover basic technical information about the vehicle.
3. Mileage information is collected through self-estimated annual/monthly/weekly mileages and odometer readings.
4. The odometer readings can be extrapolated through a suitable modelling approach to total average annual mileages.
   - must consider that high mileage vehicles have a higher likelihood of being covered by the survey due to the sampling procedure. This must be corrected by suitable design weights.

This survey format requires reliable odometers, and suitable testing sites.

Box G.25.7: IRENA Off-grid renewable capacity

Driven by technological innovation, falling costs, supportive public policies as well as new financial solutions, the production of off-grid electricity has increased tremendously in the past decade. Off -grid electricity includes both small, self-powered devices such as solar lights, solar home systems and street lights, as well as larger applications, such as mini-grids. Similarly, small scale biogas production offers great opportunities in terms of access to clean energy and is increasing rapidly in many countries. However, the collection of statistics for these applications is facing the same difficulties as for off -grid electricity.

The growth of this sector justifies the need for accurate monitoring (for instance, to track progress on objectives of access to electricity). However, by nature, measuring production in these applications is more difficult than for larger producers that supply electricity to the grid or for commercial biogas facilities, as there is often no monetary transaction associated with their use.

IRENA has published ' Measurement and estimation of off-grid solar, hydro and biogas energy', a note that describes methods used to measure or estimate recent trends in off-grid renewable energy production and use. It refers to various data sources that were used in IRENA's off-grid capacity database, including national sources, international databases and more.

The methodology description covers sources used to estimate the **electricity capacities** for:

- Off-grid hydropower
- Solar lights and solar home systems
- Solar mini-grids
- Solar pumps
- Biogas power plants

It also includes the sources used for estimating **biogas digester capacities**.

The assumptions made about lifetime expectancies for these applications are particularly useful as it is often easier to obtain the yearly capacity addition than the capacity in use.

Further, the actual energy production calculation method from all the above off-grid technologies is described. This includes assumptions made in terms of capacity utilisation factors, which are also a key element for the calculation. The proposed factors could be used in the absence of in-country measurements.

Finally, the production figures are used to calculate a level of energy access (following the tiered approach), and some information is provided regarding the assumptions on allocation of energy end-uses.

Additionally, tables presenting off-grid data by country and technology are included for reference.

G.25.4. Analysing quality of energy data and identifying problems

The quality of the energy data collected depends on the data accuracy, completeness, timeliness, coverage, and on their compliance with international recommendations and classifications in terms of definitions and methodologies.

The energy data validation procedure can be separated into three main categories:

- respect of the methodologies and definitions
- consistency validation (where each data point is evaluated in relation to others of the same reported period) and
- time series validation (where data points are observed across the entire time span collected).

In terms of the second type of validation, two main aspects of consistencies are to be evaluated:

- The arithmetic consistency: covers aspects such as the coherence of the totals with the breakdown elements, as well as the ratio of the statistical difference to the totals, and the ratio between quantities reported as "Not specified" and the totals. It can also include a mirroring exercise for the international trade when it is reported by both trade partners; details on examining mirror statistics in the context of trade statistics are given in chapter F.20.
- The physical consistency: covers issues such as transformation efficiencies (ratio between energy output and input (e.g., electricity generation and coal combustion, or petroleum products and crude oil), as well as load factor (ratio between the actual production and the theoretical maximal production) and physical properties of the fuels (energy content).

In terms of time series checking, two main aspects can be identified:

- Trends: Any break in the series (start, stop, strong increase/drop) might indicate a data issue. In the case of monthly or quarterly data, seasonality can add another layer of verification: the data can be compared to the same period in previous years to factor in the effect of the weather and other seasonal patterns. Trend analysis requires the definition of a threshold above which the variation in the compared data is considered suspicious.
- Context: The identified trends are reviewed in light of the general energy context, such as policy effects (e.g., Nuclear plant decommissioning, subsidies for photovoltaics, efficiency of appliances etc.), socio-economic effects (energy prices, population and GDP growth), weather effect (e.g. Hydro plant availability, energy demand for heating), specific events (e.g. accidents or wars in key regions) etc.

Furthermore, there are other types of validation such as the comparison between data revisions and between the same data points reported to different organisations. Such checks are carried out e.g., by regional organisations when validating the energy data provided by their member countries.

Within the European Statistical System (ESS), the ESSnet on Validation of Data (ValiDat) brought together a group of National Statistical Institutes in the EU Member States to establish a generic reference framework for data validation.

Additional validation takes place downstream in the data process. The calculation of energy balances and other indicators, for instance, allows identification of potential data issues through the calculation of energy efficiency indicators, because it can normalize the figures (e.g., per capita) thus allowing comparisons across countries.

G.25.5. Key issues for building or improving a statistical system in the energy sector

National Statistical Offices (NSOs) collect energy statistics from various sources. In order to improve or build a statistical system, it is therefore of primary importance to start by clearly identifying the data origin, then to establish an efficient institutional collaboration with the data providers and finally to establish the methodology and process to be used in order to ensure accurate and timely data submission.

Appropriate legislation related to the statistical work is the minimum requirement, and the starting point for developing national capacity. A well-defined statistical legislation should stipulate that national administrations:

- must dedicate an independent entity to oversee data collection (including a team for energy statistics);
- must oblige the respondents to provide information to this entity and put in place well-defined repercussions if they fail to do so. Otherwise some respondents could simply refuse to cooperate due to the additional burden;
- should additionally grant the entity access to data collected by other administrations (e.g. ministry of transports).

A formal service-level agreement or memorandum of understanding between the organisations involved is often necessary to align the interests of entities involved in the data collections. Such an agreement could cover:

- the access to administrative registers to obtain administrative data needed for energy statistics;
- the collaboration with managers of other surveys – households and industries– to obtain information to be used to produce energy statistics (and possibly to add new questions to these surveys);
- the implementation of procedures to ensure access to the data required.

Workshops with all partners can be organised to define the framework of the agreement, based on the statistics to be produced, and to organise the data collection.

The EU4Energy programme supports the countries of Eastern Europe, Caucasus and Central Asia in elaborating action plans for development of their energy statistics. Among the outcome of the projects, some recommendations were prepared which aimed at improving energy data quality and ensuring that statistics were disseminated and used to support policy-making.

Once the legal framework is in place, the dedicated authority (NSO, ministry) should act as the national focal point for data collection activities. Even if another entity collects certain type of information, the NSO should be aware of it and should have access to it. In an ideal world, a country should only have one dataset for each purpose. Regarding energy statistics, a commonly observed issue is that the statistical office and the Ministry of Energy display different figures for the same purpose (e.g. coal production). This obviously undermines the credibility of data and could for instance alarm potential investors, as the information seems unreliable. The NSO, as the national authority on statistics, should have a leading role as the facilitator of improving and consolidating the national energy statistics. In practice, this work should be done through a national energy statistics working group. This group can be formal/informal and meet regularly/on-demand, but the most important is to offer all the involved institutions a two-way channel to pass on information and receive feedback and above all agree on the methodology.

Adopting international standards for energy statistics presents great advantages, as it leads to improved transparency and international comparability of the official energy information. The usefulness of the collected information increases notably by aligning with the international methodology. This may require modifying existing surveys used for national energy data collection, but any new surveys should be aligned to correspond to the international standards from the start. The IRES is an essential document for the national statistical offices in developing countries when adopting the international methodology.

With that intent, it can be useful for developing countries establishing a new data collection system to review what has been done in other countries. The UNSD has developed the Energy Statistics Compilers Manual (ESCM) in close collaboration with the Oslo Group to support the implementation of the IRES. It provides practical guidance for compilers of energy statistics and energy balances by describing country practices. The IEA also developed and maintains an online searchable database of best practices for collecting energy end-uses and activity data from the experience of different countries. This includes practices such as surveying, modelling, measuring etc.

Even once the relevant legislation is in place, when national institutions cooperate on a formal level and international statistical standards are adopted, real improvement happens only with capable experts. Human factor is at the core of successful energy data management and use. The number of staffs should correspond to the expected outputs (in terms of data coverage, frequency of publication), and focus should be put on increasing the expertise of the existing staff. Keeping in mind that the main areas of statistical work cover data collection, analysis and dissemination, all these areas should be supported through targeted technical training. The quality of the data and the punctuality of the publications are key factors for assessing the usefulness of the deliverables.

IRENA has published a structured methodology that countries can use to assess their capacity to produce renewable energy statistics. It describes requirements for effective data collection, highlighting some of the challenges often faced by countries in each area and suggesting improvements that can be made.

It is also useful to arrange workshops where data providers and users can exchange views, supported by external facilitation (e.g. regional or international organizations) in order to ensure that the dissemination is in line with the needs of the data users.

To find out more…

International policy references

- Sustainable Development Goals; in particular SDG 7 'Ensure access to affordable, reliable, sustainable and modern energy for all'; SDG 9 'Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation'
- African Union: Agenda 2063 – The Africa we want
- European Commission: Hydrogen (website with information, among other things, about the EU Hydrogen Strategy and the REPowerEU plan)

Methodologies and guidelines

- UNSD: International Recommendations for Energy Statistics (IRES)
- Eurostat and IEA: Energy statistics manual
- Eurostat: Energy balance guide
- Eurostat: Methodology for data collections: Annual data; Monthly data; Price data
- ESSnet Valdat (Validation of Data): Methodology for data validation 1.0 – revised edition
- EU and IEA: EU4Energy – Statistics manuals
- IEA: Energy efficiency indicators: fundamentals on statistics (manual for statisticians) and National data collection practice database
- UNSD: Energy Statistics Compilers Manual (ESCM) and Country practice examples
- IRENA: Capacity needs assessment for renewable energy statistics
- IRENA: Measuring small-scale biogas capacity and production and Testing IRENA's biogas survey guidelines: Lessons learned in six countries
- IRENA: Measurement and estimation of off-grid solar, hydro and biogas energy
- UN FAO: Guidelines for the incorporation of a woodfuel supplementary module into existing household surveys in developing countries
- GIZ: Approaches for establishing in-use vehicle stock and vehicle mileages
- GIZ: Next steps under the Paris Agreement and the Katowice Climate Package

Legislation, classifications and nomenclatures

- Regulation (EC) No 1099/2008 of the European Parliament and of the Council of 22 October 2008 on energy statistics (consolidated text)
- Regulation (EU) 2016/1952 of the European Parliament and of the Council of 26 October 2016 on European statistics on natural gas and electricity prices
- Council Directive 2009/119/EC of 14 September 2009 imposing an obligation on Member States to maintain minimum stocks of crude oil and/or petroleum products
- Regulation (EC) No 223/2009 of the European Parliament and of the Council of 11 March 2009 on European statistics
- Standard International Energy Product Classification (SIEC)
- Central Product Classification (CPC)
- International Standard Industrial Classification of All Economic Activities (ISIC)
- Harmonized Commodity Description and Coding System (HS)

Data sources

- AFREC: Energy Browser
- APEC: Expert Group on Energy Data and Analysi (EGEDA) Database
- Eurostat: Energy statistics
- IEA: Energy Statistics
- IEA: Emergency oil stocks
- IEF: Analysis and Reports
- IRENA: Energy statistics
- JODI: JODI data
- OLADE: Energy Information System of Latin America and the Caribbean (OsieLAC)
- OPEC: Data / Graphs
- UNSD: Energy statistics

G.26 Agricultural, forestry and fishing statistics

G.26. Agricultural, forestry and fishing statistics

The chapter in brief

This chapter covers agriculture, forestry and fishery statistics, as well as relevant satellite national accounts and price statistics. Due to the importance of these areas to central policy issues such as poverty reduction, hunger prevention, rural development and sustainable management of natural resources, international organisations are actively seeking to improve statistics as basis for decision making, monitoring and evaluation.

Small-scale and subsistence farming and fishing often make up a large part of these sectors in partner countries; both production and employment are often not captured by historical methods of statistical surveys and administrative data collection.

The chapter starts by identifying the main policy areas for which these statistics are used and continues by providing a user's view of the statistics involved. The chapter then identifies the main sources of data and information about methods, continues by discussing how to analyse the quality of the statistics in these fields, and concludes with information on complementary sources.

G.26.1. Policy applications: what these statistics are used for

Agriculture, forestry and fisheries statistics have a wide variety of uses, including

- Providing timely information on agriculture, forestry and fisheries, which are key sectors for income, employment and provision of food and basic materials in most partner countries. These statistics cover both the structure of the sectors and their production of goods;
- Analysing the production processes of the agricultural, forestry and fishing industries and the primary income and employment generated;
- Supporting trade policy for agricultural, forestry and fishing goods, providing information on bilateral and multilateral trade issues and the impact of individual policies;
- Monitoring sustainable use of natural resources such as fish-stocks and forests, and protection of the environment such as water quality and soil degradation;
- Providing information for research, analysis and impact assessments on topics related to agriculture, forestry and fishing, and for quantitative studies such as forecasts.

The agricultural, forestry and fisheries policy objectives of countries with which the EU cooperates may differ considerably from EU policies, as may the sector structure. For these reasons, the statistics compiled and analysed outside the EU may differ considerably from those within the EU, even without taking budget constraints into consideration.

G.26.2. Concepts and definitions

The chapter covers a wide range of agriculture, forestry and fisheries statistics, including:

- agricultural production statistics
- censuses and surveys of agricultural holdings: farm structure, labour input, other inputs
- agricultural price statistics
- Economic accounts for agriculture
- food balance sheets
- agri-environmental indicators
- forest resources production statistics
- fisheries: statistics on fishing fleet, catch, landings, production, aquaculture
- Agriculture SDG indicators

This chapter does not deal with environmental statistics or statistics on rural development; the former are the subject of chapter G.24. Neither does it cover the specific statistical methodology and organisation of censuses and surveys in the areas covered.

Global methodologies and classifications have been developed so that statistics can be unambiguously understood and can be used in international comparisons. The implementation of these standards often needs to be adapted to the needs and the situation of individual countries. National statistical sources tend to focus on accurate representation, international publications on comparability of statistics. Sufficient statistics should be available to provide the information needed to analyse national and sub-national agricultural policies.

The core international initiative in the sector is the 'Global Strategy to Improve Agricultural and Rural Statistics', presented by the World Bank, jointly with the UN and FAO to the UN Statistical Commission in 2010 as a response to the declining quantity and quality of agricultural statistics and to the increasing demands for data, including from the Sustainable Development Goals (SDGs):

- ***A Conceptual Framework for the Collection of Agricultural Statistics*** was based on a thorough assessment of users' data needs. It pointed to many emerging requirements from issues closely linked to agriculture such as poverty and hunger, the environment and climate change, the use of land and water, and the increasing use of food and feed commodities to produce biofuels. Based on these requirements, the conceptual framework broadens the scope and coverage of agricultural statistics to include aspects of fisheries, forestry, and rural households and provides a menu of indicators.
- ***Identifying a Minimum Set of Core Data and Determining National Priorities***. Because the complete set of data requirements identified in the conceptual framework exceeds the existing statistical capacity of

many countries, a minimum set of core data is to be used as a starting point upon which to develop the Global Strategy. This core set of data will provide national and international policy makers necessary information that goes across national boundaries. The Global Strategy provides a framework for countries to add items of national interest to the set of core data and to determine the frequency with which they will be provided.

- ***Integration of Agriculture into National Statistical Systems***. Overlapping data requirements and the need to improve underlying statistics and methodology point directly to the need to integrate agriculture into the national statistical system. Incorporating agriculture into national statistical systems will facilitate the concentration of resources from multiple sources and remove the duplication of effort in producing statistics.
- ***Sustainability of Agricultural Statistics by Governance and Statistical Capacity Building***. The conceptual framework leading to the integration of agriculture into national statistical systems points to requirements for governance that bring together the efforts of the different stakeholders, especially the national statistical institutes and ministries of agriculture.

G.26.2.1 AGRICULTURAL PRODUCTION STATISTICS - CROP AND ANIMAL PRODUCTION

Agricultural statistics cover crops and animal production; basic processing; and inputs. They play a key role in the design, implementation and monitoring of agricultural policy and of food policy, including food security; provide information to agricultural markets; and also contribute to ensuring food safety and to providing data on climate change. Together with data on agricultural holdings, which are covered in the next section, they provide the basis for many of the statistics considered later in this chapter, notably crop balances; for production forecasts; and for agricultural geographical information systems[1].

At national level, publications should report statistics by administrative area, where appropriate. Data disaggregated by modern and traditional farming methods or by biome can in some cases be distinguished in national statistical publications. Within the EU, most data are collected at national level but some are available by NUTS 2 area.

Data collection has traditionally been through administrative systems or surveys. Administrative systems are questionnaires completed by farmers or agricultural workers. The information collected in this way in partner countries is often both inaccurate and slow.

Agricultural censuses and surveys, considered in the section below on Agricultural holdings, can produce more accurate results but are more expensive and are not necessarily faster.

Remote sensing satellite imagery can also be used to estimate areas under cultivation. Subsistence farming is an important aspect for providing food security in many partner countries. It is therefore important to develop strategies for capturing or estimating this agricultural production. The Global Strategy favours statistical censuses and surveys to provide and utilise respectively a master sample frame; administrative data is seen as a supplement in the general case.

Specialised surveys (or samples within larger surveys) can provide information about genetic diversity, hence SDG indicators 2.5.1 and 2.5.2.

Crop statistics cover the area harvested, yield and production quantity. Yield, as production per area, should be consistent with the other two statistics (but may not be in practice). Crops can be grouped into cereals, oilseeds; dry pulses; root crops; fibre crops; vegetables; and permanent crops (fruit, nuts, berries, vines and olives).

Processed crops include production of oils, basic sugar products, cotton products and others. These are manufactured goods and so are often presented under production statistics – Eurostat presents processed crops under its manufactured goods statistics (PRODCOM).

Statistics are collected on stocks of live animals, including poultry. Livestock statistics cover numbers of producing / slaughtered animals; yield in terms of carcass weight; and production quantity in weight or egg count. Again, the yield data should be calculable from the other statistics. Agricultural inputs cover statistics on fertilizer and pesticide use for agriculture. Fertilizers can be measured by type of nutrient or product. Pesticide sales and use in agriculture is measured by product type: insecticides, herbicides, fungicides and others.

Regulation (EC) No 1165/2008 concerning livestock and meat statistics describes in detail the collection, validation and dissemination of data, analysis of methods and update of metadata information.

EU statistics on crop products are collected under Regulation (EC) No 543/2009 as amended by Commission delegated Regulation 2015/1557. Methodologies for data collection in the EU are given in the Annual Crop Statistics Handbook. Statistics are obtained by sample surveys, supplemented by administrative data and estimates based on expert observations. Sources vary from one EU Member State to another because of national conditions and statistical practices. National Statistical Institutes or Ministries of Agriculture are responsible for data collection in accordance with EU Regulations. The statistics relate to more than 100 individual crop products.

1 A global example is the FAO 'Gridded Livestock of the World', discussed in Box G.26.2. below.

G.26.2.2 AGRICULTURAL CENSUSES AND SURVEYS ON THE STRUCTURE OF AGRICULTURAL HOLDINGS

Statistics on agricultural holdings (households or companies), are collected using censuses and surveys. In partner countries, data on households producing crops and livestock for own use as well as for local markets are necessary to get exhaustive information about the agricultural sector.

The data describe the structure of agricultural holdings. The data are often used in conjunction with population census information to derive social indicators.

The following SDG indicators are directly informed by surveys of agricultural holdings:

- 2.3.1 Volume of production per labour unit by classes of farming/pastoral/forestry enterprise size
- 2.3.2 Average income of small-scale food producers, by sex and indigenous status
- 5.a.1 (a) Proportion of total agricultural population with ownership or secure rights over agricultural land, by sex
- 5.a.1 (b) share of women among owners or rights-bearers of agricultural land, by type of tenure

A census of agriculture collects data on the structure of agriculture, covering the whole or a significant part of the country. Typical structural data collected in a census of agriculture are size of holding; areas under cultivation, grazing and other use; livestock numbers; labour; irrigation; tools, equipment and machinery; and land tenure.

The 'Global Strategy to Improve Agricultural and Rural Statistics' notes that:

'The coverage of agricultural statistics should be as exhaustive and as comprehensive as possible, and any omission of units based on their size, importance, location, or other criteria should be avoided. Many countries apply such criteria to reduce the costs of collecting data. … This selective focus leaves smaller plots and remote parts of a country unrepresented in agricultural statistics, although these areas may account for a majority of the country's food insecurity and poverty. The omission of small-holder and household plots also deprives decision makers of information about local subsistence strategies or the amount of income households receive from selling produce from gardens and small plots. Because many small holdings are often the responsibility of women, the omission of this information overlooks a key source of gender-disaggregated data on well-being.'

The 'Global Strategy' explains the relationship between the agricultural census which creates / updates the 'master sample frame' and, based on this, periodic sample surveys:

'The master sample frame is to be constructed based on the requirements to include both households and farms as statistical units. It provides a link between the census framework and land use. An integrated survey framework will be established to provide data measured consistently across time and comparable across countries using an annual survey of selected core items and periodic data from a set of rotating panels covering economic and environmental issues.'

As noted by the 'Global Strategy', *'The basic unit for social statistics is the household; for environmental statistics it is the land parcel. The challenge will be to link these statistical units.'* Measurement and recording are made much easier by geo-referencing and maintaining a geographical information system of all the data collected. This method incorporates the traditional 'farm register' and allows alternative names and descriptions of land holdings to be maintained.

The FAO's 'World Programme for the Census of Agriculture 2020' (WCA 2020) presents guidelines for the ten yearly agricultural census round to be carried out between 2016 and 2025 with the objective of providing internationally comparable data while addressing emerging information needs:

'This publication features the discussion of four modalities for conducting a census of agriculture: the classical (one-off) approach, which is still widely used; the modular approach …; the integrated census/survey modality, involving rotating survey modules over the years between two censuses; and the combined census modality, which uses administrative data. The distinguishing features are in the design of these four modalities and not in whether complete or sample enumeration is used. Another important feature …. [is] the notion of "essential" items, and a clear distinction between "essential" items and "frame" items. It is recommended that all countries collect the essential items regardless of the census modality. The frame items are intended primarily for inclusion in the core module of a census using the modular approach, to provide data for the frames for the supplementary modules or follow-up surveys.'

The treatment of food security is updated in WCA 2020, introducing the new standard Food Insecurity Experience Scale (FIES), which can be applied in a census or survey. Subsistence, informal, nomadic and shifting cultivation are covered by WCA 2020.

Each statistical collection should be carried out as a component of the national statistics system, whether by the statistics institute, agriculture ministry or agency or other organisation.

The World Bank implements, with national partners, the Living Standards Measurement Study - Integrated Surveys on Agriculture (LSMS-ISA), a household survey project:

'Recognizing that existing agricultural data in the region suffers from inconsistent investment, institutional and sectoral isolation, and methodological weakness, the LSMS-ISA project collaborates with the national statistics offices of its eight partner countries in Sub-Saharan Africa to design and implement systems of multi-topic, nationally representative panel household surveys with a strong focus on agriculture. The primary objective of the project is to foster innovation and efficiency in statistical research on the links between agriculture and poverty reduction in the region.

In each partner country, the LSMS-ISA supports multiple rounds of a nationally representative panel survey with a multi-topic approach designed to improve the understanding of the links

between agriculture, socioeconomic status, and non-farm income activities. The frequency of data collection is determined on a country-by-country basis, depending on data demand and the availability of complementary funding.'

In the EU, the Farm Structure Survey, carried out as a sample survey every 2 or 3 years with a census every 10 years, provides data on land use, livestock farming and the agricultural labour force. It is based on Regulation 2018/1091. The basis is a standard EU definition of an agricultural holding. The survey is also the statistical basis for sample surveys on land use, livestock and agricultural income. The results form the basis of Eurostat's agriculture statistics and are used for the EU Farm Accountancy Data Network (FADN), an instrument for evaluating the income of agricultural holdings and the impact of the Common Agricultural Policy.

G.26.2.3 AGRICULTURAL PRICE STATISTICS

Agricultural price statistics provide information on agricultural products at farm gate, on agricultural inputs and at other points in the value chain. Changes in prices are the most common measurements but the comparison of price levels between different areas can also be important.

Various price measurements are used to measure farm income; measure local price changes; provide early warning of changes to food security; form part of national consumer and producer price indices used to measure inflation and (less frequently) the national price level; and provide global commodity prices as international economic indicators.

Agricultural surveys (see above) and administrative returns provide information about quantities sold and income received, so that the basic price received by the producer can be calculated. Data collection for the producer price index serves the same purpose and can be integrated.

Prices of basic goods observed on local markets may differ in both level and trend between various parts of a country, due to transport costs, local market structure, different income levels and availability. Food prices are collected in local shops and markets for the consumer price index. In some localities, prices of basic food commodities are more frequently collected as a food security early warning indicator. Price collection for these two purposes should be integrated.

Export unit prices can be calculated for agricultural products provided that quantity data are collected. Where available, these indicators depict the prices received by exporters – potentially useful for economic management in countries whose major exports are agricultural products.

Finally, international commodity prices track world markets. Price levels and volatility can influence the planting decisions of farmers in many partner countries. Commodity price indices provide a means of tracking price changes over time. Monthly and seasonal average prices vary between reporting agencies, due to detailed definitional differences.

Prices of inputs are most relevant when collected in agricultural surveys or in the data collection for the producer price index.

Of interest also is the International Comparison Programme, globally coordinated by the World Bank, which develops purchasing power parities based on comparable prices; see also section F.19.2.7. Agricultural products and inputs figure significantly in the product baskets. These data can be used for Economic Accounts for Agriculture (see section G.26.2.5).

European Union metadata and methodology for agricultural price statistics, can be found in the relevant Eurostat metadata and the Handbook for EU Agricultural Price Statistics.

G.26.2.4 FOOD BALANCE SHEETS

Food Balance Sheets (FBS) systematically measure food availability within a country thereby informing food policy, in particular food security. As a proxy for food consumption, derived indicators can be used to measure risk of hunger, malnutrition, import dependence and food self-sufficiency, as well as for other purposes. Food balance sheets provide this information by accounting for the sources and uses of all food commodities, incorporating changes in stocks, products used for processing, products used by the producers etc.

Common uses of food balance sheets are:

- Measuring and analysing overall food supply – to estimate a country's overall Dietary Energy Supply (DES) and macronutrient availability
- Food supply assessment through the calculation of derived indicators, covering hunger, malnutrition, import dependence and food self-sufficiency, notably Prevalence of Undernourishment (PoU)
- Benchmarking and market analysis: comparing food availability from one country to another, both on an aggregate level and on a product-specific level, including for market research.
- Comparing food availability across time including estimated total caloric availability, growth of consumption in new products, and general changes in dietary composition. Policy uses include tracking obesity rates..

The FAO 'Guidelines for the compilation of Food Balance Sheets' describe the food balance sheets and their primary uses as:

'… an aggregated and analytical data set that "presents a comprehensive picture of the pattern of a country's food supply during a specified reference period. This is achieved within an accounting framework, wherein all potential sources of both supply and utilization of a given food product are specified. The quantities allocated to all sources of total supply – the amount of the food item produced, the amount of the food item that is imported, and the amount of the item that is either added to or taken from stocks – must be equal to the quantities allocated to all sources of utilization, which can include exports, losses along the supply chain, livestock feed, seed use, tourist food, food processing,

industrial uses, other uses, and food available for consumption by a country's residents. This balance is compiled for every food item … consumed within a country, and all of the primary commodity equivalent balances are then combined into a single overall FBS. An estimate of per capita supply for each food item – both in terms of quantity and, through the application of food conversion factors, in terms of caloric value, protein, and fat content – can then be derived by dividing by the country's population. These per capita estimates of caloric value for individual food products are then summed to obtain the total daily per capita Dietary Energy Supply (DES) of a country.

Because FBS track overall food availability and not actual consumption, the DES cannot be used as an estimate of how much nourishment the average resident is consuming, but rather as an indicator of whether sufficient food is available nationally, particularly for developing countries, where undernourishment is more likely to be a problem. … FBS are also useful for analysing the overall content of a country's diet, including determining the availability of a certain variety of food. … In the context of developing countries, analysing shortfalls in the availability of certain foods in the FBS could be one approach to better understand the nature of malnutrition in a given country.

… To the extent that the methodology for compiling FBS and deriving DES estimates is similar across countries, these estimates can be used to compare food availability from one country to another. This comparison is possible both on an aggregate level and on a product-specific level.'

The agricultural production, price and farm income and consumption statistics described above provide the source data used by the Food Balance Sheet, supplemented by trade data and potentially by data from specific surveys, such as on consumption by tourists and product loss at intermediate stages of the supply chain. The 'Guidelines' claim that FBS can be usefully compiled even with limited source data, provided that appropriate methodology is followed. At the same time, the Guidelines recommend *'that countries invest resources in improving the measurement of input data before attempting to compile country-level FBS.*

There is no substitute for input data measurement, and reliable FBS depend upon reliable input data.' Retention of metadata is also important to provide institutional memory from one FBS compilation exercise to the next.

The 'Guidelines' recommend that FBS coverage should cover *'products that represent at least 90 percent of total caloric consumption, as identified in household consumption surveys. … at least the most-consumed commodities in each commodity group are represented'*. Regional or subnational FBS accounts can be compiled to better target food security policies within countries that have wide regional disparities, requiring additional methodologies and data sources.

The 'Guidelines' note that production of a FBS *'can be time-consuming and require additional resources for agricultural statistics and analysis.' On the other hand, as noted in the 'Guidelines', FBS provides 'a framework for reconciling data, as total supply must equal total utilization. … for most countries and most products, the necessary input data will come from a variety of different sources and agencies within the government, and potentially even from semi-official actors providing information on a single commodity. While reconciling these data may be time-consuming, the process provides a unique opportunity to both harmonize data collection efforts across agencies…'*

The European Commission's DG AGRI and Joint Research Centre (JRC) produce an EU-wide Food Balance Sheet and simplified FBS, updated three times a year. Methodological information is available and can serve as a reference point.

The Food Balance Sheet is a physical accounting framework.

G.26.2.5 ECONOMIC ACCOUNTS FOR AGRICULTURE

Economic Accounts for Agriculture (EAA) utilise a corresponding money-based supply-use framework to provide a satellite account to the national accounts, covering in detail the agricultural products and services sold by agricultural units, held in stocks on farms, or used for further processing by agricultural producers, in conformity to the System of National Accounts (SNA). Please refer to chapter F.17 for a discussion of national accounts in general.

Economic Accounts for Agriculture support analysis of the value added and labour input in the agricultural sector and provide information on the economic situation of a country's agriculture and on interdependencies within the sector. They provide monetary values for farm income and along the value chain. Hence, they can potentially provide information on rural poverty and on agricultural market opportunities. They are used for policy analysis and sector forecasting. In the European Union and Enlargement Countries, the EAA provide the information basis for the Common Agricultural Policy.

The EAA framework is ambitious, requiring comprehensive input data that can be adapted to a consistent framework. The EAA are of greatest interest to countries with a significant agricultural sector and relatively well-developed agricultural statistics and national accounts.

The EAA cover agricultural products and services produced over the accounting period. The main indicators are labour input, output, intermediate consumption, gross and net value added, compensation of employees, other taxes and subsidies on production, net operating surplus or net mixed income, property income, net entrepreneurial income, etc. at current and at constant prices. The Economic Accounts for Agriculture consist of a sequence of inter-related accounts:

- the production account
- the generation-of-income account
- the balancing items 'value added' and 'operating surplus'

The EU Economic Accounts for Agriculture are based on the European System of Accounts 2010 and defined by Regulation (EC) No 138/2004 of the European Parliament and of the Council on the economic accounts for agriculture in the Community.

G.26.2.6 AGRI-ENVIRONMENTAL INDICATORS

Agri-environmental indicators illustrate the interactions between agriculture and the environment. Common objectives are to:

- track the impact of agriculture and farm policies on the environment
- assess the impact of agricultural and environmental policies on environmental management of farms
- monitor environmental impacts on agriculture

Food security concerns motivate much of this work in partner countries. In the EU, agricultural policy is a major driver. Climate change is of global interest. Land use; natural resource depletion; and soil and water contamination are the other common areas of policy focus.

FAO's study 'A Literature Review and Key Agri/Environmental Indicators' identifies the following key topics: water; land use and soil; climate change and air quality; and biodiversity and landscape.

The FAO/OECD/Eurostat agri-environmental dataset identifies the following domains and within these close to 30 indicators:

1. Air and climate change
2. Energy (use in agriculture and bio-energy production)
3. Fertilizers
4. Land (area, use-change, irrigation, conservation, cropping patterns and organic, protection)
5. Livestock
6. Pesticides
7. Soil (erosion, degradation and carbon)
8. Water
9. Emissions by sector
10. Emissions intensities

Indicators must be relevant to national and local conditions. This makes international comparisons difficult. The FAO study 'A Literature Review and Key Agri/Environmental Indicators' provides alternative indicators within each domain to ensure adequate coverage, relevance and, to the extent possible, comparability.

Agri-environmental indicators are derived from a wide variety of statistical sources, including from the agricultural statistics described in the previous sections. Therefore, when designing agricultural surveys and administrative data collection, the compilation requirements for agri-environmental indicators need to be considered.

FAOStat contains a wide collection of agri-environmental statistics. An example of a specialist agri-environmental statistical dataset is the FAO / EU 'Agriculture Stress Index System 2' (ASIS2). This provides *'a quick-look indicator for the early identification of agricultural areas probably affected by dry spells, or drought in extreme cases'*, as part of the FAO's 'GIEWS - Global Information and Early Warning System'. This *'monitors the condition of major food crops across the globe to assess production prospects. To support the analysis and supplement ground-based information, GIEWS utilizes remote sensing data that can provide a valuable insight on water availability and vegetation health during the cropping seasons.'*

Indicators that measure agri-environmental states or conditions sometimes do not measurably change over a one-year period. When data collection and compilation costs are significant, intermittent international cross-sectional data for the same year are the norm. In this respect, the 'Global Strategy to Improve Agricultural and Rural Statistics' notes that:

A fundamental way to evaluate agriculture's effect on the environment is to monitor changes in land cover and use. Land cover does not change rapidly and data are not, therefore, required on an annual basis. However, mapping products or digitized data from remote sensing should provide complete coverage for the entire land mass of a country …

Another example of intermittent data compilation is the FAO Global Livestock Environmental Assessment Model, whose objective is:

'…to quantify production and use of natural resources in the livestock sector and to identify environmental impacts of livestock in order to contribute to the assessment of adaptation and mitigation scenarios to move towards a more sustainable livestock sector.'

The EU agri-environmental indicators (AEIs) are used for monitoring the integration of environmental concerns into the Common Agricultural Policy (CAP) at EU, national and regional levels. A set of 28 indicators was developed by the European Commission and Member States; Eurostat disseminates the available indicator fact sheets and identifies the data provider for each indicator. Broadly, they provide the following functions:

- provide information on the farmed environment
- track the impact of agriculture on the environment
- assess the impact of agricultural and environmental policies on environmental management of farms
- inform agricultural and environmental policy decisions
- illustrate agri-environmental relationships to the broader public

The System of Environmental-Economic Accounting (SEEA) is a statistical standard for environmental-economic accounting, incorporating agriculture, forestry and fisheries. This builds on the EAA framework described in the previous section and provides a similar consistent framework. The UNECE dedicated website notes that it *'is a source of information for SDG monitoring, especially for SDGs 6, 7, 8, 12, 13, 14 and 15.'* The United Nations SEEA website defines the standard as follows:

'The System of Environmental-Economic Accounting (SEEA) is a framework that integrates economic and environmental data to provide a more comprehensive and multipurpose view of the interrelationships between the economy and the environment and

the stocks and changes in stocks of environmental assets, as they bring benefits to humanity. It contains the internationally agreed standard concepts, definitions, classifications, accounting rules and tables for producing internationally comparable statistics and accounts. The SEEA framework follows a similar accounting structure as the System of National Accounts (SNA). The framework uses concepts, definitions and classifications consistent with the SNA in order to facilitate the integration of environmental and economic statistics.'

Agriculture contributes to pollutant emissions in the air and in water, to the use (and potential depletion) of water resources, and to the biodiversity of the areas where it is practiced. Therefore, it is a prominent sector among environmental and climate change statistics, as attested by the discussion is sections G.24.2, G.24.4. G.24.5 and G.24.7 of the Guide.

G.26.2.7 FORESTRY STATISTICS

Data on forest cover and on changes in land use/cover in forest areas provide evidence for monitoring and sustainable forest management policies, especially concerning climate change and also for local population income and food security.

The core indicators recommended for compilation by the 'Global Strategy to Improve Agricultural and Rural Statistics' are:

- Area in woodlands and forests; quantities removed; and their prices for land associated with agricultural holdings.
- Area in woodlands and forests; quantities removed; and their prices for products from non-agricultural holdings and respective utilizations.

Work on forestry production statistics at international level is coordinated by FAO, Eurostat, UNECE and the International Tropical Timber Organization (ITTO) through the Intersecretariat Working Group on Forest Sector Statistics. The separate institutions compile statistics on the production and trade of wood from national sources through their annual Joint Forest Sector Questionnaire (JFSQ), covering wood removal, production and trade.

The FAO 'Guidelines on data collection for national statistics on forest products' describes the uses of forest statistics; the forest production chain the JFSQ is used to measure and the associated statistical standards; the design of the statistical sample frames and surveys; the means of data validation and reconciliation; and the design of indicators and statistical presentations.

The data is reported by FAO through the Global Forest Resources Assessment (FRA). *This 'provides essential information for understanding the extent of forest resources, their condition, management and uses. Forests are more than trees and fundamental for food security and improved livelihoods. They contribute to resilience of communities by regulating water flows, providing food, wood energy, shelter, fodder and fibre, generate income and employment as well as harbour biodiversity. Furthermore, forests support sustainable agriculture and human well-being by stabilizing soils and climate.'*

Coverage consists of:

1. Extent area
2. Forest characteristics
3. Growing stock, biomass and carbon
4. Production and multiple use
5. Biodiversity and protected areas
6. Ownership of forests
7. Management rights of public forests
8. Employment in forestry

Data is every five years; the most recent cycle published refers to 2020.

The Global Forest Resources Assessment makes use of satellite remote sensing surveys in order to *'build country capacities to use remote sensing for forest monitoring as well as to generate independent, robust and consistent estimates of forest area and its changes over time at global, regional and biome levels'.*

FAO's general statistical database, FAOStat, also contains information on forestry production and trade, forestry trade flows and forest land CO_2 emissions.

In the EU, annual data is also compiled to produce 'Integrated environmental and economic accounts for forests' (IEEAF). These satellite accounts of the European System of Accounts, similar to the EU Economic Accounts for Agriculture.

G.26.2.8 FISHERIES STATISTICS

Statistics on fishery resources inform policy making for sustainable fisheries management, commercial decisions, and trade policy. Since fish is a major source of food and household income, living conditions and nutrition policies are also relevant for fishing communities. Statistics are used to track the impact of fisheries on natural resources and environments.

Data are collected on fisheries production, transformation, trade, and consumption, classified by capture of fish in the open sea, captures in coastal zones managed by each country, captures from rivers and other freshwater sources, as well as aquaculture. Countries are responsible for providing statistics on all fisheries and aquaculture within their national jurisdiction, including their exclusive economic zone as well as conducted by vessels that sail under their flags. Food balance sheets for fisheries and fishery products reconcile sources and uses.

The 'Global Strategy to Improve Agricultural and Rural Statistics' recommends focusing on statistics which give information on food supply:

- Quantity of fish landed and discarded, number of days fished, amounts processed for food and non-food uses, prices, and imports and exports.
- For aquaculture: area cultured, production, prices, and net trade of imports and exports

FAO is directly concerned with sector statistical methodology, having published the 'Strategy for Improving Information on Status and Trends of Capture Fisheries' in 2003. The Coordinating Working Party (CWP) on Atlantic Fishery Statistics *'provides a mechanism to coordinate the statistical programmes conducted by regional fishery bodies and other intergovernmental organizations with a remit for fishery statistics.'* FAO, Eurostat, OECD and regional and global fisheries, conservation and ocean study organisations participate.

The motivation for and content of the CWP Handbook of Fishery Statistics Standards are as follows:

'Considering capture fisheries and aquaculture from a global or a regional perspective requires national fisheries statistical programmes to be coherent and consistent and demands a common set of regional or interregional statistical standards which apply internationally recognized definitions, classifications and codes.

The CWP Handbook covers the concepts, definitions, classifications and data exchange protocols – and not least the codes as applied to capture fisheries and aquaculture statistics globally. … The Handbook indicates the principles applied by the international agencies and no attempt has been made to include details of national systems, many of which, having been developed for specific national purposes, may differ from those employed internationally.'

Regional Fishery Bodies coordinate data collection by national reporting offices and management of fishery resources and fisheries. Data collected by Regional Fishery Bodies generally contain detailed information on operational and biological aspects of capture fisheries. Thus, the Indian Ocean Tuna Commission (IOTC), *'an intergovernmental organisation responsible for the management of tuna and tuna-like species in the Indian Ocean'*, compiles and publishes statistics; provides capacity building; and sets and monitors compliance with fishing standards.

Fish contribute to food security in partner countries, both as a source of income and as a basic food. A sourcebook on 'Design and Implementation of Fishery Modules in Integrated Household Surveys in Developing Countries' has been produced by the World Bank as part of the Living Standards Measurement Study–Integrated Surveys on Agriculture (LSMS-ISA) project, in conjunction with the WorldFish Center, an NGO. The document provides technical guidance on the design of statistical modules and questionnaires aimed at collecting fishery data at household level. It also outlines the background of main policies relevant to the fishery sector. Information on the data needed to analyse issues of policy relevance, and methodology on the construction of survey questions to collect necessary data are also provided.

FAO has a global remit to publish statistics on fisheries and aquaculture. The main recommended data source is the 'Yearbook of fishery and aquaculture statistics.' It contains data on:

- capture production, fleet and employment
- aquaculture production
- commodities
- food balance sheets

FAO's FishStatJ app is an application available to anybody who wishes to access FAO's fisheries and aquaculture statistics. WorldFish Center also supports a global fish species database.

Fisheries statistics are compiled by Eurostat from official national sources for the EU Member States and members of the European Economic Area (EEA) using international concepts and definitions. Production statistics from aquaculture, catches and landings cover fishery products taken for all purposes by all types and classes of fishing units and by area. Eurostat fisheries statistics are designed to meet the data requirements of the Common Fisheries Policy (CFP). The focus is on the statistics required for control and support of management and sustainable exploitation of fisheries resources.

Collected EU recommended methodologies can be found in Eurostat's handbooks on 'Aquaculture' and 'Catches and Landings'. A view of the objectives of sector statistics is provided by 'Evaluation of the European Fishery Statistics', which assesses the implementation and impact of the five European fisheries statistical regulations and the use and impact of the resultant statistics.

Interestingly, the EU food balance sheets do not include fisheries products. Instead, the European Market Observatory for Fisheries and Aquaculture Products (EUMOFA), a DG MARE project, publishes statistics, based on those of Eurostat, which include a supply-side balance sheet for the EU, as well as other sector data.

G.26.2.9 AGRICULTURE SDG INDICATORS

FAO acts as top-level custodian for 21 of the SDG indicators related to the following Sustainable Development Goals:

SDG 2 Zero hunger
SDG 5 Gender equality
SDG 6 Clean water and sanitation
SDG 12 Responsible consumption and production
SDG 14 Life below water
SDG 15 Life on land

The following table shows where the material related to each SDG indicator is covered in this chapter.

Box G.26.1: SDG indicators considered by this chapter	
SDG / Indicators	***Where considered***
SDG 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture	
2.1.1 Prevalence of undernourishment	G.26.2.2 Agricultural censuses and surveys and others
2.1.2 Prevalence of moderate or severe food insecurity in the population, based on the Food Insecurity Experience Scale (FIES)	G.26.2.2 Agricultural census and surveys G.26.2.3 Agricultural Price Statistics
2.3.1 Volume of production per labour unit by classes of farming/ pastoral/forestry enterprise size	G.26.2.2 Agricultural holdings
2.3.2 Average income of small-scale food producers, by sex and indigenous status	G.26.2.2 Agricultural holdings
2.5.1.a Conservation of plant genetic resources for food and agriculture	G.26.2.1 Agricultural production statistics - crop and animal production
2.5.1.b Conservation of animal genetic resources for food and agriculture	G.26.2.1 Agricultural production statistics - crop and animal production
2.5.2 Proportion of local breeds classified as being at risk of extinction	G.26.2.1 Agricultural production statistics - crop and animal production
2.a.1 Increase investment, including through enhanced international cooperation, in rural infrastructure, agricultural research and extension services, technology development and plant and livestock gene banks in order to enhance agricultural productive capacity in developing countries, in particular least developed countries	G.26.2.2 Agricultural censuses and surveys
2.c.1 Adopt measures to ensure the proper functioning of food commodity markets and their derivatives and facilitate timely access to market information, including on food reserves, in order to help limit extreme food price volatility	G.26.2.3 Agricultural Price Statistics
SDG 5: Achieve gender equality and empower all women and girls	
5.a.1 Women's ownership of agricultural land	G.26.2.2 Agricultural census and surveys
5.a.2 Women's equal rights to land ownership	
SDG 6: Ensure availability and sustainable management of water and sanitation for all	
6.4.1 Water use efficiency	G.26.2.6 Agri-environmental statistics
6.4.2 Water stress	G.26.2.6 Agri-environmental statistics
SDG 12: Ensure sustainable consumption and production patterns	
12.3.1 Global food losses	G.26.2.2 Agricultural censuses and surveys
SDG 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development	
14.4.1 Fish stocks sustainability	G.26.2.8 Fisheries statistics
14.6.1 Illegal, unreported unregulated fishing	
14.7.1 Value added of sustainable fisheries	G.26.2.8 Fisheries statistics
14.b.1 Access rights for small-scale fisheries	
SDG 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss	
15.1.1 Forest area	G.26.2.7 Forestry statistics
15.2.1 Sustainable forest management	G.26.2.7 Forestry statistics
15.4.2 Mountain Green Cover	
Data on progress on these indicators can be found at the FAO publication 'Factsheets on the 21 SDG indicators under FAO custodianship. A highlight of the main indicators with the greatest gaps in country reporting,' 2020.	

G.26.3. Sources of data and metadata

Statistics on agriculture, forestry and fishing are mostly compiled at national level. National statistical publications, from national statistics institutes, agriculture and other ministries or other public agencies, should, in principle, follow international guidelines at the same time as responding to the reporting needs of the country and of sub-national regions. Where appropriate, distinct biomes should be reflected in the data.

International organisations publish agriculture, forestry and fishery transport statistics for their member countries. The Food and Agriculture Organization of the United Nations (FAO) has a global mandate. Regional and member organisations such as Eurostat, the United Nations Economic Commission for Europe (UNECE) and the Organization for Economic Co-operation and Development (OECD) publish statistics covering their member countries and often have an influence on statistical standards.

The most important data source for worldwide statistics on agriculture, forestry and fisheries is FAO, which publishes statistics on agriculture, forestry and fishery in both general and specialist databases. FAOStat, its generalist on-line database, contains time-series from over 210 countries and territories, covering statistics on production, inputs, agriculture emissions, land use, emissions, trade, food balance, food security, investment, agri-environmental indicators, prices, forestry, R&D indicators and emergency response.

FAO's CountrySTAT is a web-based information technology system for food and agriculture statistics at national and sub-national levels. It provides access to statistics on production, prices, trade and consumption. CountrySTAT aims to harmonise information on food and agriculture among its member countries. The data are owned and maintained by the countries themselves. CountrySTAT gathers and harmonises scattered institutional data, so that the information becomes consistent within the country and compatible with data at the international level. FAO forms partnerships with statistical offices and the ministries of agriculture, fisheries and forestry to introduce the system and build the national capacity to use it. In each country, the national government makes a substantial contribution to ensure its deployment and continued training and maintenance.

In addition to these main datasets FAO supports many specialist statistical databases. Some of these are discussed in the relevant parts of section G.26.2 above; others are shown in the 'To find out more - data sources' box at the end of the chapter.

UNECE disseminates forestry statistics and some data on agriculture for about 50 countries. Several indicators are available for forestry statistics: forest resources, forest health and vitality, productive functions, biological diversity, protective functions and socio-economic functions.

The OECD collects and publishes data on agriculture, and trade, sustainable agriculture, pesticides and fisheries through its OECD-FAO Agricultural Outlook.

Eurobase, Eurostat's free dissemination database provides rich and high-quality information agriculture, forestry and fisheries in the European Union, European Economic Area and enlargement countries, as well as a range of methodological notes and guidelines.

G.26.4. Analysing data quality and identifying problems

The quality of data for agriculture, forestry and fisheries depends on data coverage and disaggregation, the timeliness of the published figures and their compliance with the agreed methodology. For comparisons and analyses, international standards and classifications should be respected. All statistical publications should be accompanied by 'sources and methods' documentation.

An understanding of the appropriate data concepts, of the methodologies that were used in compiling the statistics and any differences between them can be important to interpreting the statistics correctly.

Statistics from international organisations are generally intended to be comparable between countries. Since many countries adapt the international statistical standards to meet their specific needs, it is very common, especially in less developed countries, for the international agencies to adjust national data to ensure comparability. Therefore, the statistics published by national and international sources may differ, even if they originate from the same statistical exercise. While this situation occurs in many areas of official statistics, it is more marked in these sectors. For example, a 'year' may refer to a 'calendar year' or a 'season or harvest year'. Both concepts are useful in different contexts. Where international data sources have adopted different standards, statistics published by these agencies may differ. The Agricultural Market Information System (AMIS) explicitly compares commodity price data produced by FAO-AMIS, the US Department of Agriculture and the International Grains Council. For the reasons outlined, statistics may even differ between datasets from the same international agency.

Noting again that there are good methodological reasons why statistics from partner country national sources may differ from the data in international publications, similar data from both publications indicate that the international institution accepts the national methodology. On the other hand, historically there have been cases in other statistical fields where national statistical institutes have contested the interpretation of their data by international agencies. More commonly, communications problems between national and international agencies may mean that recent national data is not reflected in international publications.

Where national data are missing, global agencies resort to estimation or imputation to ensure complete datasets. The

resulting figures are flagged. Various means exist to produce estimated or imputed data. The ideal situation occurs when past data for the country and current data for comparable countries are both available. Estimation methods can then make use of pooled time-series and cross-sectional data. This is the case for much of Eurostat's data estimation. These techniques are not always possible. Imputations, either in national or international data sources, based on a repeatedly imposed annual percentage or value change should be viewed with suspicion.

Timeliness is especially important for agricultural production statistics: the data are better consumed fresh. For example, data about a record harvest have little information value if they become available only a year after the harvest.

Coverage is a critical factor for the completeness of agricultural and fishery statistics in partner countries which entails the incorporation of subsistence producers through surveys. Statistics based on purely administrative sources are likely to exclude much subsistence production.

National publications from different ministries, agencies and sub-national administrations may cover the same statistics with different values, especially for administrative agriculture statistics. Competing data sources are a sign of an imperfectly coordinated national statistical system. There is no prior means of identifying which, if any, of the sources is accurate.

Especially where the national statistical system is not fully functioning, alternative data sources may exist. These consist of surveys carried out, usually with foreign assistance, that do not form part of the national statistical system. Some of these studies are of high quality in difficult conditions. These may be the only statistics available but are often unique exercises that do not form part of a time series. The user should check that these statistics adhere to international methodological standards that are adapted to local conditions. Only a part of the country may be covered and geographical disaggregation may or may not follow national administrative divisions. Comparability with national data may be difficult.

G.26.5. Improving sector statistics

The objective of any intervention on statistics is to improve their availability and quality, which consists of relevance; accuracy and reliability; timeliness and punctuality; coherence and comparability; and accessibility and clarity. In this way, quality statistics meet the information needs of their users. Interventions should address any critical points in the data chain, from conception of the statistics, system setup via data collection and processing, through to the publication of statistics.

Statistics on agriculture, forestry and fisheries have a wider range of users than most sector statistics, whose needs cover social, environmental, income and business issues. Users are both national and international. NGOs concerned with poverty and the environment and international commodity traders use the same statistics. Sector intervention should support national government policies that take account of these disparate needs, perhaps through a national strategy for development of statistics or similar exercise.

Links to key initiatives and strategy papers can be found in the 'To find out more ...' box at the end of this chapter.

Box G.26.2: Some specialist FAO datasets

GLIPHA

The Global Livestock Production and Health Atlas (GLiPHA), is a user-friendly, highly interactive electronic atlas using the Key Indicator Display System (KIDS) developed by FAO. The atlas provides a scalable overview of spatial and temporal variation of quantitative information related to animal production and health through the combination of maps, tables and charts.

Forestry Country Information

The Forestry Country Information contains statistics on forest and forestry issues on a country-by-country basis including forest cover, plantations, volume and biomass as well as fires.

AQUASTAT

AQUASTAT is FAO's global information system of water and agriculture developed by the Land and Water Development Division of FAO. AQUASTAT provides users with comprehensive statistics on the state of agricultural water management across the world, with emphasis on partner countries and countries in transition.

Gridded Livestock of the World

This FAO dataset provides geographical information and resources relating to global livestock systems covering: ***'all aspects of the supply and use of livestock commodities, including the distribution and abundance of livestock, the different production systems in which they are raised, estimates of consumption and production now and in the future, the people engaged in livestock production and the benefits and impacts of keeping livestock.'*** It aims to provide ***'Detailed, contemporary data sets on the global distribution of the most important species of farmed animals [which] have a wide range of applications in understanding the social, economic, environmental, epidemiological and public health impacts of the livestock sector.'***

Domestic Animal Diversity Information System

The database supports analysis of the diversity of livestock breeds on national, regional and global levels including the status of breeds regarding their risk of extinction. According to the website, it enables the user ***'to make informed decisions on the management of animal genetic resources.'***

The 'Global Strategy to Improve Agricultural and Rural Statistics' provides a framework for project conception and design that responds to the range of user needs while complying with international methodologies and ensuring sustainability. The Global Strategy website provides a vast store of relevant information, including notably the 'Guidelines on Strategic Plans for Agricultural and Rural Statistics (SPARS)'.

A regional approach may be useful if countries have similar needs or a common capacity building mechanism exists. The 'Pacific Strategic Plan for Agricultural and Fisheries Statistics' is an example of a regional approach.

A useful tool is to organise design working groups or workshops with key users and data providers. These meetings can be used to define an action plan and prepare recommendations on methodologies. The user group should not only comprise international organisations and national authorities but also NGOs involved in these fields as well as independent researchers and analysts.

Data on agriculture, forestry and fishing are often collected both by the National Statistical Offices (NSOs) and by ministries of agriculture, rural development, environment etc., and associated administrations. Estimates of, e.g., crop production and area may be published both by the NSO and the responsible line ministry, often with different results. An efficient use of resources requires that data collections are not duplicated. It is therefore vital to establish close cooperation between the institutions concerned. There is no general recommendation on which agency should compile specific statistics; this depends on the structure of the national statistical system. A formal service-level agreement or memorandum of understanding, especially for statistical activities not covered by legislation, is often necessary to align the interests of the two services. The existence of competing data sources is an opportunity to improve the data by consolidating the various exercises and make better use of resources. Resolution may depend on effective coordination of the national statistical system.

International statistical methodologies specify acceptable data collection methods and validation procedures. Introduction of new data collection, processing and validation techniques may be required to meet the quality requirements. Remote sensing by satellite; implementing a GIS framework; employing telephone- or computer-based interview and data capture; and web-based data processing and dissemination are all regularly used in partner countries.

A key quality issue is that basic credibility and consistency checks on the data are implemented. These checks are especially important to agriculture, forestry and fisheries statistics, which normally draw on several different sources. In particular, methods and coverage should be compatible between the organisations that collect these different data.

In partner countries, the handling of agriculture, forestry and fishing in the informal sector is also of huge importance for the completeness and information value of the statistics.

Introduction of food balance sheets, discussed in section G.26.2 above, may be used to improve data coherence. These enable, for example, the validation of production data for a specific crop against data from markets, cooperatives and wholesale buyers, in order to assess differences in data between the two sides of the crop market.

The Global Donor Platform for Rural Development (GDPRD) sourcebook of indicators for monitoring and evaluation: 'Tracking results in agriculture and rural development in less-than-ideal conditions' provides the means for setting up an indicator based monitoring and evaluation system.

The OECD handbook 'Measuring the non-observed economy' presents different approaches for measuring and estimating the scope and value produced by the 'informal economy', i.e., also covering subsistence activities. Approaches are presented both within the frame of national accounts and for statistics on normally non-observed structures, production and employment.

Box G.26.3: Using new technology to improve data quality: LSMS-ISA

The Living Standards Measurement Study – Integrated Surveys on Agriculture (LSMS-ISA) seeks to improve agricultural data in Sub-Saharan Africa. At the heart of this project is engagement with both line ministries and national statistical offices to design and implement panel household surveys emphasizing agriculture.

Besides supporting the production of high-quality household level data, the project emphasizes the validation of measures and indicators and promotes research in data collection methods. Some of the areas being considered include improved methods for quantification of agricultural production, particularly for difficult-to-measure crops such as tubers and vegetables; measurement of agriculture and non-farm self-employment income; and for understanding how farmers are adapting to and mitigating the effects of climate change.

The new surveys employ state-of-the art techniques and methods, including GIS technologies and the use of Computer Assisted Personal Interviews (CAPI) to provide more accurate estimates and reduce the time lag between data collection and dissemination.

To find out more…

Core strategies

- World Bank. 2010. Global Strategy to Improve Agricultural and Rural Statistics .© Washington, DC.
- Global Strategy to Improve Agricultural and Rural Statistics resources
- Food and Agriculture Organization (FAO): World Programme for the Census of Agriculture 2020
- World Bank: Living Standards Measurement Study – Integrated Surveys on Agriculture (LSMS-ISA)
- Factsheets on the 21 SDG indicators under FAO custodianship. A highlight of the main indicators with the greatest gaps in country reporting

Further strategies and methodologies

- FAO: Guidelines for the compilation of Food Balance Sheets
- EU Economic Accounts for Agriculture: Regulation (EC) No
- 138/2004 on the economic accounts for agriculture; Regulation (EC) No 212/2008 amending Annex I to Regulation (EC) No 138/2004
- FAO: A Literature Review and Key Agri/Environmental Indicators, 2017
- FAO: Global Information and Early Warning System on Food and Agriculture (GIEWS)
- UN: System of Environmental-Economic Accounting
- UNECE: System of Environmental-Economic Accounting
- FAO: Guidelines on data collection for national statistics on forest products
- EU: The European framework for integrated environmental and economic accounting for forests
- Coordinating Working Party on Atlantic Fishery Statistics (CWP): Handbook of Fishery Statistical Standards
- FAO: Strategy for Improving Information on Status and Trends of Capture Fisheries
- WorldFish Center / World Bank LSMS-ISA: Design and Implementation of Fishery Modules in Integrated Household Surveys in Developing Countries
- Eurostat: Aquaculture Handbook, 2018 edition
- Eurostat: Catches and Landings Handbook, 2019 edition
- Evaluation of the European Fishery Statistics, 2019
- Pacific Strategic Plan for Agricultural and Fisheries Statistics
- Tracking results in agriculture and rural development in less than ideal conditions
- OECD Measuring the Non-Observed Economy - A Handbook
- WorldFish Center

Data sources

- Eurostat free statistics database Eurobase
- Eurostat: Statistics on agriculture
- JRC: EU estimated agricultural balance sheets
- DG AGRI: EU Food Balance sheet; Balance sheets by sector
- Eurostat: Agri-environmental indicators context
- EU agri-environmental indicator set
- Eurostat: Fisheries Statistics
- European Market Observatory for Fisheries and Aquaculture Products
- FAO: FAO statistics
- FAO: FAOStat
- FAO: CountrySTAT
- FAO: Global Livestock Production and Health Atlas (GLiPHA)
- FAO: Gridded Livestock of the World
- FAO: Domestic Animal Diversity Information System
- FAO: Forestry Country Information
- FAO: AQUASTAT
- FAO: Global Livestock Environmental Assessment Model (GLEAM)
- FAO: Global Forest Resources Assessment
- FAO: Yearbook of Fishery and Aquaculture Statistics
- FAO: FishStatJ app
- FAO / EU: Agricultural Stress Index
- Agricultural market information system
- Indian Ocean Tuna Commission data and statistics
- UNECE Statistics
- OECD - FAO Agricultural Outlook
- International Tropical Timber Organization (ITTO)

European Union - further documents

- Regulation No 1165/2008 – animal statistics
- Regulation No 543/2009 – crop statistics (consolidated text)
- Regulation No 2018/1091 – Farm Structure Survey (consolidated text)
- Eurostat Annual Crop Statistics – Handbook 2023 Edition
- Farm Structure Survey – Statistics Explained article
- Eurostat: Agricultural Price Statistics metadata
- Eurostat: Handbook for Agricultural Product and Input Price Statistics
- European Union - Farm Accountancy Data Network (FADN)
- European System of Accounts, 2010 (ESA2010)

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Print: ISBN 978-92-68-07816-7
PDF: KS-GQ-23-013-EN-N

Guide to statistics in European Commission development cooperation

The "Guide to statistics in European Commission development cooperation" provides extensive information on statistics in development cooperation, presenting key international initiatives supporting partner countries in building sustainable statistical systems that produce quality statistics.

The Guide explains the 'statistical machinery', covering the organisation, functioning and products of national statistical systems, as well as key international quality frameworks and principles. It presents tools for assessing statistical systems, strategic plans for developing statistical institutions, management of national projects/programmes in the field of statistics, training, as well as different aspects of statistical capacity building.

It presents a summary of EU support to statistics, including issues such as requests for support to statistical capacity building, indicators to feed result-based management tools, monitoring development partnerships or assessing the performance of policies and interventions.

The Guide can be used to identify and develop actions to support statistics and statistical indicators to define and follow-up cooperation programmes, including sector policies. It provides insight into the statistics in a wide range of specific sectors, from agriculture to social statistics, from sustainable development indicators to business statistics.

The 2023 edition of the Guide compiled in one single publication the four volumes of the previous edition for easier reference and updated the chapters related to economic statistics.

Finally, it should be noted that this is the sixth edition of the Guide, the previous ones being released in 2011, 2012, 2013, 2017 and 2021.

For more information
https://ec.europa.eu/eurostat/

Publications Office
of the European Union

Print: ISBN 978-92-68-07816-7
PDF: KS-GQ-23-013-EN-N