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Report of the Partnership on Measuring Information and Communication Technology for Development

Note by the Secretary-General

In accordance with Economic and Social Council decision 2023/325 and past practices, the Secretary-General has the honour to transmit the report of the Partnership on Measuring Information and Communication Technology for Development, which is submitted to the Commission for information.

* E/CN.3/2024/1.





Report of the Partnership on Measuring Information and Communication Technology for Development

I. Introduction

1. The Partnership on Measuring Information and Communication Technology for Development was launched in 2004 to improve the availability of internationally comparable statistics on information and communications technology (ICT).¹ Since 2005, ICT statistics have been a regular item on the agenda of the Statistical Commission every two years. The previous report of the Partnership (E/CN.3/2022/21) was issued in 2022. In the present report, the Partnership provides an overview of the work it has undertaken since then and considers the role of ICT indicators in monitoring development goals and targets.

II. Information and communications technology indicators for monitoring development goals and targets

A. Global and regional perspectives

2. During the World Summit on the Information Society Forum held in March 2023, the Partnership held a thematic session on ICT indicators for monitoring international goals and targets.² Session participants discussed whether the Partnership's core list of ICT indicators was sufficient to answer current and future policymaking needs. At the session, the Envoy of the Secretary-General on Technology considered capacity development to be a priority for helping developing countries to measure progress, including in the context of the Sustainable Development Goals, as well as for building collaboration between the statistical community and the holders of new data sources, such as big data and artificial intelligence (AI). In its input for the online consultation on the global digital compact, the Partnership highlighted the need to consider statistical measures and the means to produce them.

3. In its input provided to the 2023 high-level political forum on sustainable development, the Partnership recalled that, of the 232 indicators in the Sustainable Development Goal monitoring framework, only 7 were ICT-related, despite the great potential of ICTs to accelerate human progress, as noted in the 2030 Agenda for Sustainable Development.³ There is a disconnect between policies for digital development and the availability and quality of official statistics needed to establish a baseline, monitor progress and evaluate impact.

4. In 2019, the Partnership proposed a thematic list of ICT indicators to complement those in the Sustainable Development Goal monitoring framework.⁴

¹ As at November 2023, the following entities were members of the Partnership: the International Telecommunication Union (ITU); the Organisation for Economic Co-operation and Development (OECD); the United Nations Conference on Trade and Development (UNCTAD); the United Nations Educational, Scientific and Cultural Organization (UNESCO) Institute for Statistics; the Economic Commission for Latin America and the Caribbean (ECLAC); the Economic and Social Commission for Western Asia (ESCWA); the Economic and Social Commission for Asia and the Pacific (ESCAP); the Economic Commission for Africa (ECA); the Department of Economic and Social Affairs of the United Nations Secretariat; Eurostat; the United Nations Institute for Training and Research (UNITAR); the World Bank; and the International Labour Organization (ILO).

² See www.itu.int/net4/wsis/forum/2023/Agenda/Session/216.

³ See https://hlpf.un.org/sites/default/files/vnrs/2023/HLPF%202023%20Inputs%20Partnership% 20Measuring%20ICT%20%20for%20Development.pdf.

⁴ See www.itu.int/en/ITU-D/Statistics/Documents/intlcoop/partnership/Thematic_ICT_indicators_ for_the_SDGs.pdf.

1. Asia and the Pacific

5. Some of the indicators in the thematic list of ICT indicators have been included in the Asia-Pacific SDG Gateway Data Explorer of the Economic and Social Commission for Asia and the Pacific (ESCAP).⁵ Core indicators on connectivity and ICT skills serve to provide information on progress made towards achieving Sustainable Development Goals 4 and 17 in the region, highlighting both the challenges in making fixed broadband affordable and digital divides within the region.⁶ The insights provided by just a few ICT indicators already point to the need for targeted policies focused on infrastructure development, especially in rural and underserved areas. The aims of enhancing broadband affordability and improving digital literacy also underpin digital cooperation initiatives in the region. For example, in May 2023, ESCAP member States adopted a resolution entitled "Promoting digital cooperation and inclusion through the Action Plan for Implementing the Asia-Pacific Information Superhighway Initiative, 2022–2026" (resolution 79/10). With its three pillars, on connectivity for all, digital technologies and applications and digital data, the Action Plan provides a multistakeholder platform for addressing the digital divide and promoting digital transformation through regional cooperation, for equitable and sustainable development.

2. Latin America and the Caribbean

6. The Economic Commission for Latin America and the Caribbean (ECLAC) is currently developing a digital development observatory. The initiative is aimed at producing indicators to monitor the progress made by countries in the region with regard to digitalization and generate evidence to support the formulation of policies to drive digital transformation. Although there are existing indicators for connectivity of individuals and households, there is a lack of quantitative information regarding the level of digitalization among businesses, in particular in advanced technologies and the use of digital technologies across various economic sectors. There is also a growing need to monitor a wider range of themes, including significant connectivity, digital skills, e-commerce and the adoption and development of AI. The observatory is scheduled to be launched in the first quarter of 2024 and is expected to contribute to the monitoring of the 2024 version of the regional Digital Agenda for Latin America and the Caribbean (eLAC2024), which has included indicators for connectivity, e-commerce, digital skills and cybersecurity.

7. In the 2024 Digital Agenda, both the potential of and risks associated with AI have been acknowledged. Within that framework, ECLAC is committed to producing research and data to inform policy decisions, with a focus on developing digital infrastructure and connectivity, supporting innovation in AI startups, enabling digitalization in both the public and private sectors, promoting a coherent regional regulatory framework and advocating in favour of the urgent improvement of digital skills. A dedicated working group on AI has been established to produce periodic regional indices on AI, which will serve as the basis for evidence-based policies.⁷

⁵ See https://data.unescap.org/.

⁶ As from 2022, the cost of fixed broadband service in the region was 3.2 per cent of the gross national income (GNI) per capita, exceeding the affordability target of 2 per cent of GNI per capita set by the Broadband Commission for Sustainable Development. For data-only mobile services, the region met the affordability target, with costs at 1.4 per cent of GNI per capita. Within the region, both East and North-East Asia have met the 2 per cent affordability target since 2018 for both fixed broadband and data-only mobile services, but South and South-West Asia and countries in the Pacific have much higher costs, especially for fixed broadband (up to 12.41 per cent of GNI per capita in the Pacific).

⁷ The first version was launched in August 2023; see https://indicelatam.cl/.

8. In order to address the digital divide in the countries of the region effectively, efforts are under way to develop a significant connectivity index within the framework of a specific working group for the 2024 Digital Agenda.

9. In addition, as part of the monitoring structure for the 2024 Digital Agenda, a measurement commission has been established to enhance the availability, quality and comparability of ICT statistics in Latin America and the Caribbean. Its activities include mapping the region's ICT statistics, producing a monitoring report for the Agenda and coordinating the construction of the regional indices.

3. Africa

10. Building on its experience from the African Information Society Initiative, policy analysis and research has been conducted on digitalization and emerging technologies. The Economic Commission for Africa (ECA) makes efforts to measure the economic, social, political and security impact of those technologies and innovation processes and continues to contribute to data gathering and dissemination, including an annual follow-up and review of the implementation of World Summit on the Information Society outcomes in Africa.

11. For instance, under the Scan-ICT initiative aimed at making quality data on ICT activities in Africa available, ECA is helping the Southern African Development Community (SADC) to develop its ICT Observatory. As a flagship project under the SADC Regional Infrastructure Development Master Plan for 2012–2027, it is intended to become a policy intelligence tool and to serve to centralize reliable, up-to-date collection and dissemination of ICT indicators, measurement, benchmarking and reports. The aim of the Observatory is to collect information from a total of 103 indicators annually (81 core and 22 extended), covering several areas. Eventually, the Observatory should support the SADC ICT centre of excellence for in-depth research and analysis based on the ICT indicators.

12. The SADC ICT Observatory developed the following six model surveys for demand-side indicators:

- (a) Model household survey for ICT indicators;
- (b) Model survey for ICT use in government;
- (c) Model survey for ICT use in business;
- (d) Model survey for ICT use in research and innovation;
- (e) Model survey for ICT use in education and skills;
- (f) Model survey for ICT use in the ICT sector and trade in ICT goods.

13. To encourage both the production of ICT indicators and reporting thereon to the Observatory, SADC developed a model memorandum of understanding between the relevant national statistics office, national regulatory authority and/or ministry of ICT, providing a formal framework for cooperation in data collection. To date, nine member States (Botswana, Eswatini, Lesotho, Madagascar, Malawi, Mozambique, Namibia, South Africa and Zambia) have put in place such a memorandum of understanding and nominated national focal points. The SADC ICT Observatory web portal and database system should facilitate data compilation and dissemination in the 2023/24 cycle. The initiative will be extended to other regional communities on the continent.

4. Europe

14. At the end of 2021, the members of the European Statistical System endorsed an action plan to better measure digitalization and its impact on society, businesses and economy. The plan was aimed at keeping ICT statistics up to date according to the latest technological developments, at contributing to the monitoring of European Union policies on digitalization and at enhancing the communication and publication of statistics linked to digitalization. At the core of the action plan are the data provided by members of the ICT statistics domain on the uptake of ICT technologies and ecommerce by enterprises and by households and individuals.

15. With the ongoing digital transformation of the European Union, data on the level of digitalization of businesses and their use of advanced technologies, such as cloud, artificial intelligence or engaging data analytics, are among the main priorities of European Union policies. Great attention is also given to the digital skills of citizens, their use of e-government services and electronic identification and the number of ICT specialists on the market to foster the digital transformation. Cybersecurity and privacy among European Union businesses and citizens are also topics in high demand at the European Union.

16. As digital transformation has an impact on the environment and on the green transition of the European Union, data relating to the environmentally friendly behaviours of enterprises and citizens when buying and using ICT equipment or services are also of interest for users.

17. Apart from the core ICT surveys, the European Statistical System is actively looking at the use of additional data sources, such as data on network coverage received from telecommunications regulators or experimental data on the labour market demand for ICT specialists received from online job sites, for the production of digitalization statistics. It is also investigating the use of credit card data, in order to produce e-commerce indicators.

B. Methodological developments

1. Household and infrastructure indicators on information and communications technology

18. Within the Partnership, the International Telecommunication Union (ITU) is responsible for collecting, harmonizing and disseminating the core ICT access and ICT household indicators and regularly reviews the indicator definitions to ensure that they remain relevant to the fast-changing pace of ICT evolution. The Expert Group on Telecommunication/ICT Indicators, which has more than 1,100 members, and the Expert Group on ICT Household Indicators, which has more than 800 members, work through online discussion forums and report on the outcome of their work to the World Telecommunication/ICT Indicators Symposium. The most recent outcomes of the work of the two expert groups were presented at the eighteenth Symposium, held in Geneva, in July 2023.

19. Both expert groups met in September 2023. At the meeting of the Expert Group on Telecommunication/ICT Indicators, participants discussed a pilot data collection on mobile money, data collection on ICT price baskets, the measurement of fixed-broadband penetration and over-the-top applications (the latter jointly with its counterpart on household indicators). In addition, at the meeting of the Expert Group on ICT Household Indicators, participants discussed e-waste indicators in household surveys and the measurement of ICT skills. The next expert group meetings are planned for September 2024.

20. Since the fifty-first session of the Statistical Commission, which was held in 2020, ITU has published its updated and revised versions of the Handbook for the Collection of Administrative Data on Telecommunication/ICT and the Manual for Measuring ICT Access and Use by Households and Individuals. ITU uses both publications to assist Governments in developing countries in their efforts to collect

and disseminate ICT data. The *Handbook* and the *Manual* are also both available as online training courses from the ITU Academy. At its 8th meeting, held in September 2020, the Expert Group on ICT Household Indicators created a subgroup to address the measurement of e-waste within the context of household surveys. Subgroup members discussed ways in which issues relevant to e-waste should be measured within the framework of household surveys and made proposals to the expert group in that regard. At the expert group's meeting held in 2021, ITU presented information on the East African Communications Organization project on regional e-waste data harmonization. The project included the harmonization of, training on and implementation of the surveys and led to a publication in 2023 in which results from the surveys were showcased.⁸ At the meeting held in 2023, expert group members adopted the framework developed by the subgroup as a guideline for the harmonized collection of e-waste data.⁹

2. Digital economy indicators

21. Within the Partnership, the United Nations Conference on Trade and Development (UNCTAD) is responsible for collecting and disseminating the core indicators on ICT use by businesses, on the ICT sector and on international trade in ICT goods, ICT services and digitally delivered services. Since the fifty-third session of the Statistical Commission, which was held in 2022, the UNCTAD Working Group on Measuring e-Commerce and the Digital Economy met in November 2022 and in November and December 2023 to discuss how to improve digital economy statistics and to exchange knowledge with producers of official statistics in developing countries about methodological progress in this area and new approaches to data collection. The next meeting of the Working Group is planned for December 2024.

22. In March 2023, UNCTAD published a report in which it takes stock of the availability of statistics on the value of e-commerce sales by businesses across countries.¹⁰ As indicated in the report, there is a limited availability of such statistics, as well as significant variation in the sources and methods used in different countries. Building on the report, and under the aegis of the Working Group, a task group on measuring e-commerce value was established, with the aim of developing methodological guidance for producing robust and comparable statistics in this area in 2024 and 2025.

23. In July 2023, the International Monetary Fund (IMF), the Organisation for Economic Co-operation and Development (OECD), UNCTAD and the World Trade Organization (WTO) jointly published a second edition of the *Handbook on Measuring Digital Trade*. While leaving the fundamental measurement framework unchanged, the second edition: (a) provides clarifications on the concepts and definitions related to digital trade, and to the guidelines on how to operationalize them; (b) offers extensive compilation guidance based on recent efforts in both developed and developing economies, covering a variety of relevant survey and non-survey sources; and (c) puts forward a proposed reporting template. The *Handbook* provides a consistent measurement framework to guide compilers in their efforts to measure digital trade. While further research and empirical testing will be needed to improve and refine the compilation approaches, the well-established conceptual framework constitutes the basis for the compilation of statistics on digital trade that are internationally comparable and consistent with the broader economic accounts. The *Handbook* also provides the foundation for an active programme of

⁸ ITU and UNITAR Sustainable Cycles (SCYCLE) Programme, Towards the Harmonization of Data Collection – A Baseline Study for E-waste in Africa (Geneva and Bonn, 2023).

⁹ See www.itu.int/itu-d/meetings/statistics/wp-content/uploads/sites/8/2023/09/Report-of-the-EGH-subgroup-on-measuring-e-waste.pdf.

¹⁰ UNCTAD, Measuring the Value of E-commerce (United Nations publication, 2023).

technical assistance and statistical capacity-building, by which the four partner organizations, IMF, OECD, UNCTAD and WTO, can support statistical compilers as they seek to measure and monitor digital trade and respond to the challenges involved in measuring such trade.

24. Lastly, in the third quarter of 2023, UNCTAD launched its biennial data collection exercise, asking national statistical offices of developing countries for the latest available statistics on the core indicators on ICT use by businesses and on the ICT sector. The compilation exercise was done for the first time through an online questionnaire, and the modest response points to a continued low availability of data on these core indicators in developing countries.

3. E-government indicators

25. Regarding ICT in government (e-government) indicators, the Division for Public Institutions and Digital Government of the Department of Economic and Social Affairs of the Secretariat conducts its survey of digital government every two years. Based on the methodology used for the questionnaire, the Division proposed that the following indicators be added to the core list in 2021 and collected as part of its United Nations E-Government Survey 2022 report:

(a) Presence of a national e-government strategy or equivalent;

(b) Presence of digital identity or similar authentication required to enable access to online services;

(c) Presence of a public procurement portal.

26. In addition, the Division constructs the e-participation index, using features from the online service index of the United Nations E-Government Survey, as well as the local online service index, to assess the online services provided by local governments, specifically by cities.

4. E-waste indicators

27. The global methodology for measuring e-waste indicators is based on the life cycle of electronic electrical equipment, from e-waste generation to e-waste management. The methodology was developed by the Partnership on Measuring Information and Communications Technology for Development¹¹ and is used for monitoring the Sustainable Development Goal subindicators on e-waste. There have since been methodological advancements to integrate household surveys into the overall e-waste statistics methodology. Those advancements have been tested and developed in Lebanon by the United Nations Institute for Training and Research (UNITAR) and the United Nations Development Programme (UNDP),¹² in several countries in the European Union by UNITAR and the Waste Electrical and Electronic Equipment (WEEE) Forum¹³ and in East Africa by UNITAR and ITU.¹⁴

28. The Global E-waste Statistics Partnership,¹⁵ first established in 2017, is managed by the ITU and UNITAR Sustainable Cycles Programme. Its objective is to help countries to produce e-waste statistics and to build a global e-waste database to track

¹¹ V. Forti, C. P. Baldé and R. Kuehr, *E-waste Statistics: Guidelines on Classifications, Reporting and Indicators*, 2nd edition (Bonn, United Nations University, 2018).

¹² C. P. Baldé, R. Panchal and V. Forti, "National e-waste monitor: Lebanon 2022", report prepared for UNITAR and UNDP, 2022.

¹³ C. P. Baldé and others, "Update of WEEE collection rates, targets, flows and hoarding – 2021 in the EU-27, United Kingdom, Norway, Switzerland and Iceland", study conducted by the UNITAR SCYCLE Programme, 2022.

¹⁴ ITU and UNITAR SCYCLE Programme, *Towards the Harmonization of Data Collection*.

¹⁵ See https://globalewaste.org/about-us/.

developments over time. The Global E-waste Statistics Partnership helps to address the global e-waste challenge by raising awareness, encouraging more Governments to track e-waste and carrying out workshops to build national and regional capacities for their respective e-waste inventories.¹⁶ It has trained participants from more than 80 countries and facilitated the adoption of a harmonized measurement framework. It also aims to map recycling opportunities from e-waste, pollutants and e-waste-related health effects, in addition to contributing to Sustainable Development Goal targets 11.6 and 12.5 by monitoring relevant waste streams and tracking target 3.2 of the ITU Connect 2020 Agenda for Global Telecommunication/ICT Development.

29. The fourth edition of the *Global E-waste Monitor*, which is currently being prepared, will contain an overview of the global challenge posed by e-waste and an analysis by country and region of e-waste generation. Since 2017, the Global E-waste Statistics Partnership has expanded national and regional capacity on e-waste statistics by offering tools and practical guidelines to help countries to understand how to gather data sources in order to compile internationally comparable e-waste statistics, using the methodology outlined in the second edition of *E-waste Statistics: Guidelines on Classification, Reporting and Indicators*,¹⁷ which were developed under aegis of the Partnership on Measuring Information and Communication Technology for Development.¹⁸ That methodology is also now used for Sustainable Development Goal indicators 12.5.1 and 12.4.2.

30. As more people globally embrace the digital economy, higher incomes, urbanization and industrialization in developing nations contribute to increased usage of electrical and electronic equipment, resulting in a surge of e-waste. In 2019, a record 53.6 million metric tons of e-waste was generated globally, and amount has continued to grow. Data on e-waste are therefore crucial for informed decision-making and for improving collection rates. Accurate information provides insights into the scale and impact of e-waste, enabling effective policymaking. Understanding generation trends helps in allocating resources efficiently and prioritizing interventions. In addition, e-waste data aid in establishing realistic recycling targets, thus guiding infrastructure development and program implementation.

5. Labour indicators

31. The International Labour Organization (ILO) will be starting the process of reviewing the most recent version of the International Standard Classification of Occupations, with special attention to be given to emerging new occupations, in particular to all occupations referring to digital skills and digital employment. At the twenty-first International Conference of Labour Statisticians, ILO presented a proposal to update the tool in real time in the future, in view of the rapid changes in occupations, in particular in the ICT industries. ILO also addressed the topic of digital platform employment and of creating a working group to define new statistical standards for this type of employment.

32. In Europe, the methodology for calculating the digital skills indicator has been further developed and adapted to the Digital Competence Framework for Citizens ("DigComp"), with a view to better capturing the competences needed for the digital transformation.

¹⁶ See www.itu.int/en/ITU-D/Environment/Pages/Toolbox/Global-Ewaste-Monitors.aspx.

¹⁷ V. Forti, C. P. Baldé and R. Kuehr, *E-waste Statistics*.

¹⁸ The guidelines underwent a public consultation and have been endorsed by ITU, ESCAP, ESCWA, OECD, UNCTAD, ECA, Eurostat and the secretariat of the Basel, Rotterdam and Stockholm conventions, administered by United Nations Environment Programme.

6. Big data for information and communications technology indicators

33. ITU is looking into innovative ways to use big data as a new data source and to overcome important data gaps. Discussions were held at various ITU World Telecommunication/ICT Indicators Symposiums held between 2013 and 2023, as well as in the course of the work of the Expert Group on ICT Household Indicators and the Expert Group on Telecommunication Indicators. In addition, ITU plays an active role in the Committee of Experts on Big Data and Data Science for Official Statistics, through its task teams on skills and capacity-building, big data and Sustainable Development Goals, and currently leads the Committee's task team on mobile phone data.

34. A methodological guide on the use of mobile phone data for measuring the information society using Sustainable Development Goal ICT indicators¹⁹ has been published online by the Statistics Division of the Department of Economic and Social Affairs in 2022 as one of six handbooks prepared by the task team on mobile phone data. In 2023, ITU began developing a package of notebooks to more easily process and calculate ICT indicators from mobile phone data.

35. In addition, through its ITU Academy, ITU launched an awareness course on mobile phone data. The course is aimed at raising awareness of what mobile phone data are and showcasing how such data can be used by a national statistical organization. Information is shared on how to obtain mobile phone data and on the opportunities and challenges such data present for incorporating their use at the country's national statistics office. The course was developed by the task team on mobile phone data and is intended for anyone interested in mobile phone data, especially those working in the field of public statistics. In a guide published by ESCAP in 2022, entitled Using Big Data for Official Statistics: Key Considerations When Using Mobile Phone Data, it is noted that big data sources can be used for monitoring and reporting on Sustainable Development Goal indicators and that Internet of things devices and mobile phone data are being actively explored for measuring the information society, satellite accounts and statistics on public transportation and smart cities.

36. ITU is also exploring machine learning models to estimate connectivity at the subnational level, using publicly available geospatial big data, including satellite imagery and data on demographics and ICT infrastructure. ICT household data are used as the "ground truth data" to train the machine learning models.

C. Capacity-building

37. In 2022, UNCTAD introduced an online course on the production of statistics on the digital economy, based on the 2020 revised edition of its *Manual for the Production of Statistics on the Digital Economy*. The course is designed to be administered on a regional basis, with the first implementation having welcomed 38 participants (25 women) from 14 Pacific island States. Feedback was highly positive, indicating that online courses are a good way to transmit baseline knowledge for statisticians starting to explore a new area of statistics. The course will be delivered in other regions over the coming years. The co-authors of the *Handbook on Measuring Digital Trade* have also collaborated to deliver workshops based on the *Handbook*, as well as guidance on measuring the value of e-commerce, into future training courses.

¹⁹ See https://unstats.un.org/wiki/display/MPDMIS.

38. In 2023, UNITAR and ITU developed an online training course on e-waste statistics, to support capacity-building efforts through the ITU Academy. Capacity-building on e-waste statistics has been done in the context of three regional e-waste monitor projects carried out in the Commonwealth of Independent States by UNITAR, the United Nations Environment Programme and ITU; in 13 countries in Latin America by UNITAR and the United Nations Industrial Development Organization; and in the Arab States by UNITAR and ITU. ITU also conducted the following regional training activities: training on ICT indicators during the ITU Digital Transformation Forum, held in Kyrgyzstan, from 28 to 30 August 2023; an online workshop on ICT indicators organized by ITU and the Communications Regulators' Association of Southern Africa, held in November 2022; and a workshop on telecommunications/ICT statistical indicators for Portuguese-speaking African countries, held in November 2023.

39. Eurostat is publishing two comprehensive manuals, which will include all relevant information for the production of ICT statistics, both for businesses and for households and individuals. The manuals will be updated annually and published on the Eurostat website.

III. Conclusions

40. The limited availability of ICT statistics in developing countries is compounded by the rapid evolution and increased complexity of the information society and its impact on development. Producers of official statistics face a continued need for capacity-building and more resources to conduct surveys and explore non-surveybased sources of data. In the context of international development goals and targets, ICT indicators are a missing dimension. It should be recognized that official ICT statistics are key inputs to digital policies for achieving international development goals and targets. Countries should prioritize the improvement of such statistics to measure progress. The international and donor communities are encouraged to increase their support for capacity-building on ICT statistics in developing countries.

IV. Action to be taken by the Statistical Commission

41. The Commission is invited to take note of the present report.