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**Economic and environmental questions:
Science and technology for development**

**Progress made in the implementation of and follow-up to the
outcomes of the World Summit on the Information Society at
the regional and international levels**

Report of the Secretary-General

Summary

This report has been prepared in response to Economic and Social Council resolution 2006/46, which requested the Secretary-General of the United Nations to inform the Commission on Science and Technology for Development about implementation of outcomes of the World Summit on the Information Society. It highlights major activities undertaken by stakeholders during 2019. It has been prepared by the secretariat of the United Nations Conference on Trade and Development, based on information provided by entities in the United Nations system, international organizations and other stakeholders.

* E/2020/1.



Introduction

1. The present report was prepared in response to Economic and Social Council resolution 2006/46. It includes information provided by 31 United Nations entities and other international organizations and stakeholders¹ in response to a letter from the Secretary-General of the United Nations Conference on Trade and Development (UNCTAD) requesting contributions on trends, achievements and obstacles in the implementation of World Summit on the Information Society (WSIS) outcomes, as well as additional information compiled by UNCTAD. The report summarizes developments and activities during 2019.

I. Key trends

A. Increased access, but a slowing growth rate

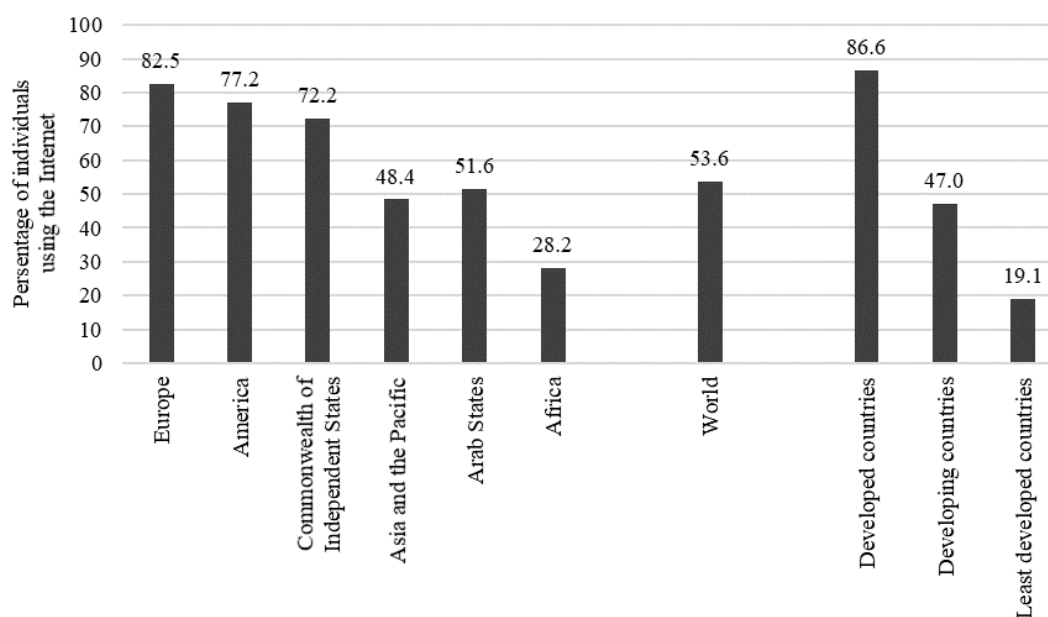
2. Access to information and communications technologies (ICTs) continued to grow during the year. Mobile cellular signals now reach more than 95 per cent of the global population, and it is estimated that 4.1 billion people, more than 50 per cent, use the Internet. Although this represents rapid growth since WSIS, there remain large discrepancies between regions and countries, while the rate of growth in access appears to be slowing as more developed and some developing countries reach saturation in telephone and Internet markets.²

3. The figure below illustrates inequalities relating to the Internet. The proportion of individuals using the Internet in developed countries is more than four times that in the least developed countries. Affordability, particularly in the least developed countries, is a powerful barrier to access for many people, reducing opportunities to take advantage of new technology and potentially exacerbating other inequalities. Fixed and mobile broadband prices exceed 5 per cent of average gross national income per capita in various developing and the least developed countries, while in many developed countries prices are lower than 2 per cent. On average, women are 17 per cent less likely than men to use the Internet. The gap ranges from 3 per cent in developed countries, to 43 per cent in the least developed countries.³ Furthermore, the use of international bandwidth grew by 33.4 per cent on average annually between 2015 and 2019; however, 89 per cent of global use is concentrated in Asia and the Pacific (43 per cent), Europe (25 per cent) and America (21 per cent).

¹ Association for Progressive Communications (APC); Council of Europe; Economic Commission for Latin America and the Caribbean (ECLAC); Economic and Social Commission for Asia and the Pacific (ESCAP); Economic and Social Commission for Western Asia (ESCWA); Economic Commission for Europe (ECE); Food and Agriculture Organization of the United Nations (FAO); International Chamber of Commerce (ICC); International Federation of Library Associations and Institutions (IFLA); International Trade Centre (ITC); Internet Corporation for Assigned Names and Numbers (ICANN); Internet Governance Forum (IGF) secretariat; Internet Society (ISOC); International Telecommunication Union (ITU); Organization for Economic Cooperation and Development (OECD); United Nations Children's Fund (UNICEF); United Nations Conference on Trade and Development (UNCTAD); United Nations Development Programme (UNDP); United Nations Department of Economic and Social Affairs; United Nations Entity for Gender Equality and the Empowerment of Women (UN-Women); United Nations Environment Programme (UNEP); United Nations Human Settlements Programme (UN-Habitat); United Nations Industrial Development Organization (UNIDO); United Nations Office on Drugs and Crime (UNODC); Universal Postal Union; World Bank; World Food Programme (WFP); World Health Organization (WHO); World Intellectual Property Organization (WIPO); World Meteorological Organization (WMO); and World Trade Organization (WTO). See <http://unctad.org/en/Pages/CSTD/WSIS-UNSG-Report.aspx>.

² <https://www.itu.int/en/ITU-D/Statistics/Documents/facts/FactsFigures2019.pdf>.

³ Ibid.

Inequalities in Internet access

Source: ITU (available at <https://www.itu.int/en/ITU-D/Statistics/Documents/facts/FactsFigures2019.pdf>).

4. The quality of infrastructure varies widely. International Internet bandwidth in developed countries is, on average, twice that in developing countries and nine times that in the least developed countries, with lower access speeds and higher costs for users in the latter. While fourth-generation mobile networks are now predominant in many countries, these networks have not yet reached most users in Africa or the least developed countries.⁴ These inequalities undermine capacity to meet the international community's goal of universal coverage of ICTs and the ability of Governments to leverage developmental gains.

B. The digital economy

5. The digital economy is changing. At the time of WSIS, it principally referred to the ICT sector itself and the relatively few businesses that were then highly dependent on it. Currently, ICTs are crucial to many sectors in most economies and are rapidly become more pervasive. Electronic commerce (e-commerce) is increasingly widespread in international and domestic markets, with global sales reaching an estimated \$29 trillion dollars and, currently, one quarter of the world's population sometimes shopping online.⁵ While engagement in the digital economy does not guarantee success, companies and countries that lag behind in ICT infrastructure, skills and services are becoming less competitive in international markets and more vulnerable in domestic markets.

6. Significant changes have been taking place in the structure of the sector. Hardware and software industries remain dynamic, with continuous improvements in capabilities leading to rapid turnover in products and services. The most dynamic growth, however, has been in data management, where corporations with roots in social media, search engines, e-commerce and cloud-based services have displaced earlier business models. Global platform and data corporations, predominantly based in the United States of America and China, currently dominate world markets in these areas.⁶

7. Powerful economic factors, which create advantages in scope and scale, underpin market concentration in network and platform sectors, whose leading companies are

⁴ Ibid.

⁵ <https://unctad.org/en/pages/PressRelease.aspx?OriginalVersionID=505>.

⁶ https://unctad.org/en/PublicationsLibrary/der2019_en.pdf.

extending into frontier technologies, including artificial intelligence and quantum computing. This has led to renewed discussion about international regulatory governance, especially concerning the exploitation of data resources and the role of competition.

8. An important discussion in this context concerns ways in which smaller and developing countries can maximize advantage in the face of competition from global players and the advent of artificial intelligence business models. Business process outsourcing, which has been a source of service sector revenue and jobs in some developing countries, is vulnerable to artificial intelligence displacement. The UNCTAD *Digital Economy Report 2019: Value Creation and Capture – Implications for Developing Countries* stressed the importance of moving beyond access and considered how countries can create and capture value in the digital economy. Developing-country digital businesses may need to focus on niche products and services that relate strongly to local markets.⁷ Governments, donors and ICT sector businesses all need to consider strategies to support national economic, social and employment needs in an age of growing economic interdependence.

C. Rights and ethics for digital technologies

9. The Geneva Declaration of Principles, agreed at WSIS, affirmed the centrality of rights in the information society. The General Assembly has since confirmed that the rights people enjoy offline should also be protected online. Particular attention has been paid to civil and political rights, but there has also been increased attention in recent years to economic, social and cultural rights, such as those concerned with employment, education and cultural diversity.

10. Much recent discussion has focused on privacy and data protection. Information about individuals is now gathered by default through automated systems for identity and public services and through digital footprints on social media, search engines and devices. Global Internet Protocol traffic has grown enormously, from about 100 gigabytes (GB) per second in 2002 to more than 45,000 GB per second in 2017, and is expected to reach 150,000 GB per second by 2022.⁸ The majority of these data are held by private corporations that leverage their commercial value, combining diverse data sets to maximize their analytical capacity. Public concern has grown about the intrusiveness and potential impact of data gathering, the risk of surveillance and the increasing use of algorithms drawing on such data sets to automate decisions that affect individuals' lives.

11. While such systems can be highly beneficial, for example in the early detection of disease, there is growing concern about the privacy and ownership of personal data, the risk that biases in existing data sets may lead to discrimination by automated systems and the implications of controversial applications that might result such as predictive policing. This has led to regulatory interventions such as the European Union's General Data Protection Regulation and to a proliferation of proposed ethical frameworks for the deployment and use of digital and frontier technologies.

D. Digital cooperation

12. The High-level Panel on Digital Cooperation was established by the Secretary-General of the United Nations in 2018 to consider means of collaboration to address the social, ethical, legal and economic impact of digital technologies in order to maximize their benefits and minimize their harm. It drew together expertise from different world regions and stakeholder contexts in the evolving age of digital interdependence. United Nations agencies in general are concerned with these issues as they seek to implement the United Nations strategy to exploit new technologies in delivering the Sustainable Development Goals.⁹

⁷ Ibid.

⁸ Ibid.

⁹ <https://www.un.org/en/newtechnologies/images/pdf/SGs-Strategy-on-New-Technologies.pdf>.

13. The High-level Panel's report, published this year, recognized that digitalization is leading to profound changes in the economy, society and culture and emphasized the need for cooperation and inclusion, drawing on multilateral and multi-stakeholder experience, in building the information society.¹⁰ The High-level Panel suggested the development of global commitments on digital cooperation and on issues concerned with trust and security, along with three alternate models for developing practical cooperation that will be considered further by the international community in 2020.

14. Research undertaken for the High-level Panel identified more than 1,000 international forum that are currently discussing different aspects of the information society. It is impossible for even the best resourced Governments and businesses to participate effectively in so many discussion spaces. The need for greater coordination is particularly acute for smaller and developing countries and for non-governmental stakeholders, such as developing country businesses – which have a particular interest in processes that set the terms and standards under which they operate – and civil society organizations concerned with the impact of digitalization on societies.

II. Implementation and follow-up at the regional level

A. Africa

15. African ICT ministers adopted a draft Digital Transformation Strategy for Africa that will be submitted to the African Union for endorsement in 2020.¹¹ A joint report by UNCTAD, ECA, the African Union Commission and the African Development Bank recommended next steps for the African Continental Free Trade Area, including e-commerce and digital integration.¹²

16. The Broadband Commission for Sustainable Development launched a working group on connecting Africa through broadband in partnership with the World Bank.¹³ ECA is also working to promote broadband development on the continent.¹⁴

17. The World Bank completed 11 diagnostic studies, under the Digital Economy for Africa Initiative, based around digital infrastructure, platforms, financial services, skills and entrepreneurship.¹⁵ A series of lending programmes was introduced following the studies and Bank assessment of African employment needs.

18. The African Internet Governance Forum was held in Chad,¹⁶ preceded by a session of the African School on Internet Governance.¹⁷

B. Asia and the Pacific

19. ESCAP conducted a regional review of WSIS implementation during the year. This noted a widening of some digital divides, particularly in fixed broadband, though there were also significant improvements in mobile broadband in middle-income countries. The review emphasized the importance of cross-border policy dialogue and operational cooperation to maximize the impact of available infrastructure.

¹⁰ <https://www.un.org/en/pdfs/HLP%20on%20Digital%20Cooperation%20Report%20Executive%20Summary%20-%20ENG.pdf>.

¹¹ <https://www.tralac.org/documents/resources/african-union/3013-the-draft-digital-transformation-strategy-for-africa-2020-2030/file.html>.

¹² <https://www.tralac.org/documents/resources/africa/2898-assessing-regional-integration-in-africa-ix-unece-auc-afdb-unctad-july-2019/file.html>.

¹³ <https://broadbandcommission.org/workinggroups/Pages/WG2-2018.aspx>.

¹⁴ https://www.uneca.org/sites/default/files/PublicationFiles/eca_policy_brief_improved_access_to_broadband_rev1_0.pdf.

¹⁵ For example, <https://openknowledge.worldbank.org/handle/10986/31841>.

¹⁶ <https://www.afigf.africa/>.

¹⁷ <https://afrisig.org/afrisig-2019/>.

20. ESCAP continued to lead the Asia–Pacific Information Superhighway initiative,¹⁸ a regional broadband initiative to improve the connectivity of landlocked developing countries to promote universal broadband and facilitate disaster preparedness. Interconnection, Internet exchange points and capacity-building are current areas of focus.

21. ESCAP also published various regional studies, covering social media and the digital divide,¹⁹ the use of broadband connectivity in education²⁰ and the operation of cross-border fibre networks,²¹ and shared expertise on satellite communication among Pacific island countries.²²

C. Western Asia

22. ESCWA has identified the need for greater regional and cross-sectoral coordination as a priority for its work to implement WSIS outcomes and the Sustainable Development Goals. Desired improvements include the development of action plans for broadband, cybersecurity, artificial intelligence and the role of ICTs in Sustainable Development Goal delivery, together with more effective measurement of digital inequalities among citizens and in the penetration of e-commerce. It has formulated recommendations to address these challenges.

23. ESCWA organized the second Arab High-level Forum on WSIS and the 2030 Agenda for Sustainable Development, focused on the digital economy, Internet governance, digital empowerment and inclusiveness.²³ It published the *Arab Horizon 2030* report, setting out the potential of digital technologies for development,²⁴ a regional report on digital trade facilitation²⁵ and reviewed national digital development reports from 10 countries.

D. Europe

24. ECE coordinates the United Nations Centre for Trade Facilitation and Electronic Business, which develops trade facilitation recommendations and electronic standards for commercial and government business processes.²⁶ During 2019, it implemented initiatives concerned with blockchain, the Internet of things, e-agriculture and e-business standards, and semantic data models.

25. The Council of Europe assists member States in developing e-governance and supports the introduction of e-participation platforms. It also focused on cybercrime, human rights and the emergence of artificial intelligence.

26. The European Commission published a report on the anticipated benefits of the European digital single market for businesses and citizens.²⁷

¹⁸ <https://www.unescap.org/our-work/ict-disaster-risk-reduction/asia-pacific-information-superhighway/about>.

¹⁹ <https://www.unescap.org/resources/who-connected-social-media-and-digital-divide>.

²⁰ <https://www.unescap.org/resources/inclusive-use-broadband-connectivity-quality-education-insights-asia-and-pacific>.

²¹ <https://www.unescap.org/resources/operation-cross-border-terrestrial-fibre-optic-networks-asia-and-pacific>.

²² <https://www.unescap.org/sites/default/files/Satellite%20Communications%20in%20Pacific%20Island%20Countries.pdf>.

²³ <https://www.unescwa.org/events/arab-forum-wsis-sdgs-2019>.

²⁴ <https://www.unescwa.org/publications/arab-horizon-2030-digital-technologies-development>.

²⁵ <https://www.unescwa.org/publications/digital-sustainable-trade-facilitation-implementation-arab-region>.

²⁶ <https://www.unece.org/cefact/>.

²⁷ https://bruegel.org/wp-content/uploads/2019/02/IPOL_STU2019631044_EN.pdf.

27. The 2019 European Dialogue on Internet Governance explored governance mechanisms for the Internet of things and artificial intelligence, and the role of regulation and public policy in the evolving digital society.²⁸

E. Latin America and the Caribbean

28. ECLAC acts as the secretariat for eLAC 2020, the region's digital agenda to implement WSIS outcomes. This includes a range of activities concerned with digital access and infrastructure, culture, inclusion and skills, Internet governance, digital transformation and economy, the regional digital market, cyberlegislation, digital government and telework.²⁹ Preparation of the next two-year agenda, eLAC 2022, is under way.³⁰

29. ECLAC published a report on the regulation of cross-border e-commerce as part of its efforts to promote a regional digital market. It organized the Artificial Intelligence Latin America Summit, with the Massachusetts Institute of Technology to address the need for greater investment in artificial intelligence within the region. It also supported regional activities concerned with big data and the development of digital policies.

30. ECLAC maintains regional observatories on information society and broadband to improve understanding of access, use and impact of ICTs.³¹

III. Implementation and follow-up at the international level

A. United Nations Group on the Information Society

31. The United Nations Group on the Information Society is an inter-agency mechanism to coordinate implementation of WSIS outcomes throughout the United Nations system which meets annually during the WSIS Forum.³² It submitted a report on partnership relating to the Sustainable Development Goals to the year's United Nations high-level political forum on sustainable development.³³

B. General Assembly and Economic and Social Council

32. The Economic and Social Council adopted resolution 2019/24 assessing progress in implementation and follow-up to WSIS outcomes.³⁴

33. The General Assembly adopted resolution 74/197 on information and communications technologies for sustainable development.

²⁸ https://www.eurodig.org/fileadmin/user_upload/eurodig_The-Hague/Messages_from_The_Hague_EuroDIG_2019.pdf.

²⁹ <https://conferenciaelac.cepal.org/6/es/documentos/agenda-digital-america-latina-caribe-elac2020.html>.

³⁰ <http://comunidades.cepal.org/elac/sites/default/files/2019-07/PROPOSAL%20DIGITAL%20AGENDA%20FOR%20LATIN%20AMERICA%20AND%20THE%20CARIBBEAN%20eLAC2022.docx>.

³¹ <https://www.cepal.org/cgi-bin/getprod.asp?xml=/socinfo/noticias/paginas/8/44988/P44988.xml&xsl=/socinfo/tpl-i/p18fst.xsl&base=/socinfo/tpl-i/top-bottom.xsl>; <https://www.cepal.org/es/observatorio-regional-de-banda-ancha>.

³² <http://www.ungis.org/>.

³³ <https://www.ungis.org/Portals/0/documents/HLPF2019/UNGIS-HLPF2019Input.pdf>.

³⁴ https://www.un.org/ga/search/view_doc.asp?symbol=E/RES/2019/24.

C. Commission on Science and Technology for Development

34. The twenty-second session of the Commission on Science and Technology for Development included a high-level round table on the impact of rapid technological change on achievement of the Sustainable Development Goals.³⁵

D. Facilitation and coordination of multi-stakeholder implementation

35. The tenth annual WSIS Forum took place in Geneva in April, with a focus on the role of ICTs in achieving the Sustainable Development Goals, especially in priority areas including health, education, employment, gender empowerment and the environment.³⁶

36. Over 3,000 participants from some 150 countries took part in more than 300 workshops and other sessions. The Forum's ministerial round table focused on ministerial collaboration in pursuit of Sustainable Development Goal objectives, while high-level dialogues considered scaling digital transformation to support the Sustainable Development Goals, ICT inclusion, the ethics of artificial intelligence, e-waste and indigenous languages. Special discussion tracks addressed ICTs and sport, youth and innovation. Prizes were awarded to recognize excellence among projects in each action line.³⁷

37. The WSIS stocktaking platform, maintained by ITU, provides information on more than 12,000 ICT and development activities undertaken by diverse stakeholders across different WSIS action lines.³⁸ ITU published a global report on stocktaking and a compendium of stocktaking success stories.³⁹

38. The Broadband Commission for Sustainable Development, jointly convened by ITU and UNESCO, draws public and private sector partners together to advocate broadband deployment. It published reports on broadband connectivity and coordinated working groups on several issues of interest to its intergovernmental, business and civil society stakeholders.

E. Civil society, business and multi-stakeholder partnerships

39. Many activities that support WSIS objectives are implemented by business, civil society, the academic and technical communities, and multi-stakeholder partnerships.

40. The ICC coordinates WSIS-related activities through its Business Action to Support the Information Society initiative and contributes to international discussions including the IGF and WSIS Forum.⁴⁰

41. The Global System for Mobile Communications Association (GSMA) represents mobile communications businesses. Its Mobile World Congress events, held during 2019 in Barcelona (Spain), Shanghai (China) and Los Angeles (United States of America), are the

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