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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 the implementation of the outcomes of the World Summit on the Information Society (WSIS). The report highlights major activities carried out by stakeholders in 2017 to implement WSIS outcomes. It has been prepared by the secretariat of the United Nations Conference on Trade and Development (UNCTAD), following information provided by entities in the United Nations system, other international organizations and stakeholders.

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Introduction

1. This report has been prepared in response to Economic and Social Council resolution 2006/46. It includes information provided by 33 United Nations entities and other international organizations and stakeholders,¹ responding to a letter from the Secretary-General of UNCTAD inviting contributions on trends, achievements and obstacles in the implementation of WSIS outcomes. The report summarizes major developments and activities in 2017. Further information on the implementation of WSIS outcomes is available in document E/CN.16/2018/CRP.2.

I. Key trends

A. Sustainable development

2. The years since WSIS have seen remarkable developments in information and communications technology (ICTs) and services and in their impact on economic and social development. Many new opportunities and challenges have emerged that affect the implementation of WSIS outcomes. The 2030 Agenda for Sustainable Development recognized that the spread of ICTs and connectivity has great potential to accelerate sustainable development. That potential lies partly in their ability to improve responses to specific developmental challenges but also through their capacity to empower individuals to address their own priorities and, increasingly, through improvements in the overall structure and efficiency of national economies and public services.

3. However, the rapid changes that have occurred and continue to occur have complex results. These technologies disrupt, displace or alter many of the institutional structures, business models and patterns of social behaviour that have underpinned economic and social development. Inequalities in ICT access and use can also lead to inequalities in impact. International organizations have emphasized the importance, in leveraging developmental value and reducing inequality, of enabling policy and regulatory environments for investment and innovation, integrating ICTs into national and sectoral development strategies, and involving all stakeholders in the development of appropriate policies and implementation plans.

¹ Association for Progressive Communications (APC); Council of Europe; Economic and Social Commission for Asia and the Pacific (ESCAP); Economic and Social Commission for Western Asia (ESCWA); Economic Commission for Africa (ECA); Economic Commission for Europe (ECE); Economic Commission for Latin America and the Caribbean (ECLAC); End Child Prostitution, Child Pornography and Trafficking of Children for Sexual Purposes International; European Commission; Food and Agriculture Organization of the United Nations (FAO); International Chamber of Commerce; International Federation of Library Associations and Institutions (IFLA); International Telecommunication Union (ITU); International Trade Centre; Internet Corporation for Assigned Names and Numbers; Internet Governance Forum (IGF) Secretariat; Internet Society (ISOC); Organization for Economic Cooperation and Development (OECD); United Nations Children's Fund; UNCTAD; United Nations Department of Economic and Social Affairs (DESA); United Nations Economic, Scientific and Cultural Organization (UNESCO); United Nations Environment Programme (UNEP); United Nations Industrial Development Organization (UNIDO); United Nations Institute for Training and Research; United Nations Office on Drugs and Crime; Universal Postal Union; World Bank; World Food Programme; World Health Organization (WHO); World Intellectual Property Organization (WIPO); World Meteorological Organization (WMO); World Trade Organization (WTO). See <http://unctad.org/en/Pages/CSTD/WSIS-UNSG-Report.aspx> (accessed 28 February 2018).

B. Steady but uneven growth in connectivity and use of information and communications technologies

4. Access to ICTs continues to grow worldwide but remains uneven, with higher levels of connectivity and usage in developed countries, compared with developing countries.² Much needs to be done to meet the commitment of the 2030 Agenda, that no one should be left behind in connectivity and access.

5. Mobile cellular and broadband connectivity are now much more widely available than fixed connectivity, particularly in developing countries. Mobile cellular subscriptions make up more than 90 per cent of voice subscriptions, while the number of fixed telephone lines is in gradual decline. There is now more than one mobile broadband subscription for every two people worldwide, a trend facilitated by the increased pervasiveness of smartphones that can make use of networks offering greater bandwidth. According to ITU estimates, less than half the world's inhabitants now make use of the Internet, and a little more than half of households have Internet access at home.

6. The rate of growth in these indicators is, however, gradual, and insufficient to achieve the Sustainable Development Goal target of universal affordable Internet access in least developed countries by 2020. ITU estimates that there were 97 mobile broadband subscriptions per 100 people in developed countries in 2017, compared with 48 in developing countries and 22 in the least developed countries. Average broadband speeds are generally lower in developing countries, while the cost of using services and devices there is typically higher as a proportion of average income than in developed countries. This inhibits take-up of online services and reduces their potential impact on development.

7. There are also considerable differences in access and use within countries. The gender digital divide, which is especially acute in the least developed countries, does not appear to be diminishing. While the proportion of young people using the Internet is over 70 per cent worldwide, Internet adoption is much lower among the elderly. Those living in rural areas and persons with disabilities continue to be disadvantaged. Low literacy levels also adversely affect adoption rates.

C. Continued rapid changes in technology

8. New technologies and services are constantly emerging, adding to the range and diversity of applications and potential impacts of ICTs on all aspects of economy, society and development. A new wave of innovation, which has been termed the “fourth industrial revolution” or the “second machine age”, includes artificial intelligence, machine learning and advanced robotics, big data and algorithmic decision-making, virtual and augmented reality, blockchain technologies, autonomous vehicles, the Internet of Things and quantum computing. There is particular interest in the potential of digitalization to facilitate smart cities, in which ICTs are widely used to improve economic and social welfare, for example through better traffic and waste management.

9. Experience since WSIS has shown how difficult it is to anticipate the pace at which specific ICTs will be adopted, and therefore to develop appropriate policies to maximize potential benefits and mitigate potential risks. Considerations of equality and inclusiveness will be important in determining the impact of current and new technologies.

D. Digital economy

10. According to the UNCTAD *Information Economy Report 2017: Digitalization, Trade and Development*, the proportion of economic activity that takes place online is growing rapidly. Global production of ICT goods and services now accounts for an estimated 6.5 per cent of global gross domestic product, while exports of ICT services

² Data in this section are derived from ITU, *2017 Measuring the Information Society 2017*, Vol. 1 (Geneva).

grew by 40 per cent between 2010 and 2015. According to UNCTAD estimates, worldwide e-commerce sales in 2015 reached over \$25 trillion, most of which were transactions between businesses.³

11. This expanding digital economy is a complex and evolving ecosystem, with a core of digital sector businesses providing infrastructure, software and data management services to platform and other digital enterprises and to a wider group of digitalized businesses that use ICTs extensively to gain competitive advantage through enhanced productivity and customer reach.

12. The growth of the digital economy poses challenges for Governments and businesses, particularly in developing countries. Many least developed countries are poorly prepared to capture the opportunities arising from digitalization. Investment in readiness for e-commerce is essential if they are to meet the challenge of increased competition in global markets and exploit the dynamism of ICTs to foster prosperity. As well as enhancing infrastructure, they must respond to the changing skills requirements of a changing world economy. All countries need not just to reskill workforces but to prepare for a labour market in which the skills of individuals, communities and countries will require continual upgrading and adjustment in response to further changes in technology and markets.

E. Cybersecurity

13. Cybersecurity is an increasingly important theme in international policy concerned with the digital economy and other aspects of the Information Society. There has been a growing incidence of serious cybersecurity attacks, some of which have had significant impacts on individuals and public services. Critical vulnerabilities in software and hardware have been identified, requiring rapid interventions by infrastructure and service providers, supported by national cybersecurity response teams.

14. Concern has been expressed about security risks associated with the Internet of Things. Some 20 billion Internet-of-Things devices are estimated to be in use today, and this number is expected to double within five years.⁴ There are no agreed international security standards for new devices, and many which have already been deployed are insecure. This increases the vulnerability not only of device owners, but of societies in general, should these devices be implicated in distributed denial of service or other large-scale cyberattacks.

15. International attention is focused on efforts to improve cybersecurity awareness among users, the improvement of security in products and services, and the need for multi-stakeholder cooperation that can respond rapidly to present threats and anticipate future threats.

F. Measuring the Information Society

16. Measuring progress towards the Information Society is challenging because of rapid changes in the potential of technology, the quality of connectivity, the capabilities of devices, the range of services and their changing impacts on economies and societies. Measures of access and use need regular updating to reflect advances in technology, such as broadband networks, smartphones and online platforms.

17. The need for more comprehensive, detailed and disaggregated data on ICTs and their impacts will intensify as currently available ICTs become more pervasive and newer digital technologies become available. Big data analysis, which leverages digital information, cloud storage and the analytical power of computing, offers new ways of understanding ICT impacts, but is dependent on data quality and raises complex issues of privacy, data protection and cybersecurity. The value of better data is also limited by the

³ http://unctad.org/en/PublicationsLibrary/ier2017_en.pdf.

⁴ <https://www.statista.com/statistics/471264/iot-number-of-connected-devices-worldwide/>.

capacity of Governments to act upon it, which requires both human capacity and financial resources.

II. Implementation and follow-up at the regional level

A. Africa

18. Information and communications technologies are less pervasive in Africa, which is less connected to the Internet than other regions. ECA coordinates regional activities to address these challenges of ICT access and use. It has identified broadband policies and strategies, pricing, universal access, harmonization of policy and regulation, and broadband for regional integration as policy priorities. It published a report entitled “*Towards Improved Access to Broadband in Africa*”,⁵ and a review of the legal and regulatory framework for ICTs in selected countries.⁶

19. The African Network Information Centre and the African Network Operators Group organized the Africa Internet Summit in May and June.⁷ The African Union Commission and Economic Commission for Africa organized the African Internet Governance Forum (IGF), which was held in Egypt in November.⁸

B. Asia and the Pacific

20. ESCAP coordinates regional reviews of WSIS implementation in Asia and the Pacific, conducts analytical studies and provides support to policy development by Governments in the region. It identified six priority challenges which need to be addressed in order to maximize the value of ICTs, including new developments such as artificial intelligence. These include narrowing the growing digital divide between countries in the region, identifying financing mechanisms for infrastructure roll-out, improving the efficiency of Internet traffic management, prioritizing drivers of broadband connectivity, increasing the use of ICTs in public administration and facilitating women’s economic empowerment.⁹

21. Member States of ESCAP have agreed upon a regional cooperation framework for the Asia–Pacific information superhighway, a regional broadband initiative to improve the connectivity of landlocked developing countries through links to submarine cables and the deployment of Internet exchange points. The first steering committee meeting focused on priority challenges for sub regional planning.¹⁰

C. Western Asia

22. ESCWA promotes efforts towards regional integration in the Arab region, and addresses regional differences in ICT access and use. It issued a report entitled “*Next Generation Digital Infrastructure: Challenges and Opportunities for Development in the Arab Region*” to facilitate the discussion of regional priorities.¹¹

⁵ https://www.uneca.org/sites/default/files/PublicationFiles/towards_improved_access_to_broadband_inafrica.pdf.

⁶ https://www.uneca.org/sites/default/files/PublicationFiles/review_of_the_legal_and_regulatory_framework.pdf.

⁷ <https://internetsummitafrica.org/>.

⁸ <http://afigf.org/>.

⁹ <http://www.unescap.org/our-work/ict-disaster-risk-reduction>.

¹⁰ <http://www.unescap.org/our-work/ict-disaster-risk-reduction/asia-pacific-information-superhighway/about>.

¹¹ <https://www.unescwa.org/sites/www.unescwa.org/files/events/files/next-generation-digital-infrastructure-arab-region-technical-en.pdf>.

23. In May, the Organization launched the Arab High-level Forum on WSIS and the 2030 Agenda for Sustainable Development, a regional platform for experience sharing and partnership development, whose first meeting adopted the Beirut Consensus on Transformation and Digital Economy in the Arab Region.¹² An expert group meeting on innovation and technology on meeting the objectives of the 2030 Agenda was held in December.¹³ A forthcoming study will discuss the achievement of Sustainable Development Goal targets by leveraging the power of ICTs and will be issued with a companion study on employment, industry and economic growth.

24. Working with the League of Arab States, ESCWA finalized and adopted the revised Arab Regional Road Map for Internet Governance, which will guide future development of the Arab IGF. It published a study entitled “*Smart Digital Transformation in Government*” and held an expert group meeting on the use of emerging technologies to improve transparency and accountability.

D. Europe

25. ECE contributes to e-commerce development through the United Nations Centre for Trade Facilitation and Electronic Business, development of electronic data interchanges, intelligent transport systems and information sharing on environmental issues. It developed new recommendations in 2017, following adoption of the Agreement on Trade Facilitation of WTO, and supported the adoption of single-window and electronic business development in the Eurasian Economic Union.

26. The Council of Europe adopted recommendations on issues including electronic voting and big data for culture, literacy and democracy, as well as guidelines on personal data in the big data environment. Threats associated with cybersecurity and the sexual exploitation of children remained priorities for the Council. A youth campaign sought to reduce hate speech and develop youth participation and citizenship.¹⁴ Judgements of the European Court of Human Rights addressed challenges of the Internet concerned with freedom of expression and respect for privacy and family life.

E. Latin America and the Caribbean

27. ECLAC implements WSIS outcomes through the Digital Agenda for Latin America and the Caribbean, the current version of which was approved in 2015. A revised 2020 digital agenda was prepared for discussion at the sixth Ministerial Conference on the Information Society in Latin America and the Caribbean, to be held in 2018. Its priorities include infrastructure; the digital economy; digital government; culture, inclusion and skills; governance and emergency technologies.¹⁵ Work continued towards the development of a digital single market in Latin America.¹⁶

28. ECLAC supports regional observatories on the Information Society (Observatory for the Information Society in Latin America and the Caribbean)¹⁷ and broadband (Regional Broadband Observatory)¹⁸ to improve understanding of access, use and impact of ICTs. The Organization held regional forums on ICTs and education, inclusion in the digital economy and alignment of WSIS implementation with the Sustainable Development Goals and is intensifying work on big data for measuring the digital economy.

¹² <https://www.unescwa.org/events/arab-forum-information-society-sustainable-development>.

¹³ <https://www.unescwa.org/sites/www.unescwa.org/files/events/files/sdg-innovation-technology-arab-region-agenda-en.pdf>.

¹⁴ <https://www.nohatespeechmovement.org/>.

¹⁵ <https://www.cepal.org/en/pressreleases/paises-america-latina-caribe-iniciaron-proceso-discusion-la-nueva-agenda-digital>.

¹⁶ <http://scioteca.caf.com/bitstream/handle/123456789/980/DigitalMarketStrategy-7dic.pdf>.

¹⁷ <https://www.cepal.org/cgi-bin/getprod.asp?xml=/socinfo/noticias/paginas/8/44988/P44988.xml&xsl=/socinfo/tpl-i/p18fst.xml&base=/socinfo/tpl-i/top-bottom.xml>.

¹⁸ <https://www.cepal.org/es/observatorio-regional-de-banda-ancha>.

III. Implementation and follow-up at the international level

A. United Nations Group on the Information Society

29. The United Nations Group on the Information Society was established by the Chief Executives Board for Coordination in 2006 as an inter-agency mechanism to coordinate implementation of WSIS outcomes throughout the United Nations system.¹⁹ It meets annually during the WSIS Forum.

B. General Assembly and Economic and Social Council

30. In July, the Economic and Social Council adopted resolution 2017/21 on assessment of the progress made in the implementation of and follow-up to the outcomes of WSIS.²⁰

31. In December, the General Assembly adopted resolution 72/200 on ICTs for sustainable development.²¹

C. Commission on Science and Technology for Development

32. The twentieth session of the Commission, held in May, included high-level round tables on eradicating poverty by promoting sustainable development, expanding opportunities and progress made in implementing WSIS outcomes. It discussed priority themes concerned with innovation to support the implementation of the Sustainable Development Goals and the role of science, technology and innovation in ensuring food security.²² Throughout the year, a working group of the Commission considered the issue of enhanced cooperation.²³ The working group is addressed in section F.2 below.

D. Facilitation and coordination of multi-stakeholder implementation

33. The annual WSIS Forum, which took place in Geneva in June under the theme “Information and knowledge societies for the Sustainable Development Goals”, attracted more than 2,500 participants.²⁴ Its programme, developed through an open consultation process, included more than 200 workshops, information and collaborative sessions, as well as coordination meetings of the WSIS action lines. A high-level session addressed 14 themes concerned with different aspects of WSIS implementation, with a particular focus on multi-stakeholder participation.²⁵ Project prizes were awarded to recognize excellence in implementing projects and initiatives in each action line.²⁶

34. The Broadband Commission for Sustainable Development, convened by ITU and UNESCO, draws together partners from the public and private sectors to advocate policies concerned with broadband deployment. During the year, multi-stakeholder working groups focused on digital scorecards, digital health, the digital gender divide, education, and space technologies.²⁷ The Commission issued an open letter to the United Nations High-level Political Forum on Sustainable Development advocating greater use of broadband in efforts to achieve the Sustainable Development Goals.²⁸

¹⁹ <http://www.ungis.org/Home.aspx>.

²⁰ http://www.un.org/ga/search/view_doc.asp?symbol=E/RES/2017/21.

²¹ <https://undocs.org/en/A/RES/72/200>.

²² <http://unctad.org/en/pages/MeetingDetails.aspx?meetingid=1272>.

²³ <http://unctad.org/en/Pages/CSTD/WGEC-2016-to-2018.aspx>.

²⁴ <https://www.itu.int/net4/wsis/forum/2017/>; <https://www.itu.int/net4/wsis/forum/2017/#outcomes>.

²⁵ https://www.itu.int/en/itu-wsis/Documents/wf17/WSISForum2017_HighLevelTrackOutcomesStatements.pdf.

²⁶ <https://www.itu.int/net4/wsis/prizes/2017/>.

²⁷ <http://www.broadbandcommission.org/workinggroups/Pages/spacetechnology.aspx>.

²⁸ <http://broadbandcommission.org/events/Documents/BBCOM-HLPFOpenLetter2017-E.pdf>.

35. A special session on digital inclusion was organized at the 2017 meeting of the World Economic Forum in conjunction with ITU and the Broadband Commission for Sustainable Development. Artificial intelligence and the fourth industrial revolution featured prominently in the Forum agenda and its initiative on shaping the future of digital economy and society.²⁹

E. Civil society, business and multi-stakeholder partnerships

36. Activities that support WSIS objectives are implemented by many stakeholders, including business, civil society organizations and the academic and technical communities, and through multi-stakeholder partnerships. ITU maintains the WSIS Stocktaking Platform, which provides information on more than 8,000 ICT and development activities carried out by diverse stakeholders, reaching 300,000 registered stakeholders.³⁰ In 2017, ITU issued “*WSIS Stocktaking: Success Stories 2017*”,³¹ and the Platform now includes an ICTs for a sustainable world (ICT4SDG) application based on a matrix of WSIS action lines and Sustainable Development Goals developed by action line facilitators.

37. The International Chamber of Commerce Commission on the Digital Economy published a policy statement, *ICT, Policy and Sustainable Economic Development*.³² An initiative launched by the Commission, Business Action to Support the Information Society, works with businesses to support WSIS outcomes, including the WSIS Forum and IGF.³³

38. The Global System for Mobile Communications Association represents mobile communications businesses. More than 100,000 people attended the Mobile World Congress in February.³⁴ The Association’s annual review, *The Mobile Economy*, provides data on mobile connectivity and use, and was supplemented in 2017 by seven regional reports.³⁵ Other publications focused on regulatory approaches for the digital age and on e-health.

39. Civil society organizations play a prominent part in the WSIS Forum, IGF and other information society meetings. APC focuses on issues concerned with development, rights and governance, including gender-related aspects of the Internet.³⁶ IFLA is particularly concerned with access to information including public access facilities, information literacy and local content.

40. ISOC provides a forum for the technical and professional Internet community and others concerned with the development and maintenance of an open Internet. It produced the *2017 Internet Society Global Internet Report: Paths to our Digital Future*, which drew on extensive research to identify drivers for change that will affect the Internet and made recommendations concerning its future role within society.³⁷ ISOC also published reports on the following topics: infrastructure development and capacity-building in support of WSIS, the Internet and education, community networks, and Internet content blocking and shutdowns.³⁸ It provided technical training to more than 1,850 experts in developing countries.

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