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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 resolutions 2006/46 and 2007/8, 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. The report highlights major developments and activities by stakeholders in 2021. It was 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/2022/1.



Introduction

1. This report has been prepared in response to Economic and Social Council resolution 2006/46. It includes information provided by 31 entities in the United Nations system, international organizations and other stakeholders 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. The report summarizes developments and activities in 2021.¹

I. Key trends

A. The pandemic: Lessons learned

2. The coronavirus disease (COVID-19) pandemic has had an impact on nearly every aspect of human society and economy. Reductions in domestic production and international trade resulting from pandemic-related restrictions have adversely affected government revenues and individual incomes. Jobs have been lost; education, curtailed; and health and other public services, subject to pressure on resources.

3. The role of digital technologies in mitigating the impacts of the pandemic has been substantial, enabling greater continuity than would otherwise have been possible. Many office jobs have moved online. Online transactions have allowed businesses and households to maintain supply and demand for goods and services. Students have learned remotely while schools and universities have been closed. Digital technologies have also played a major role in medical response, as the rapid analysis of clinical data has facilitated vaccine development and public health measures to contain infections. These examples of resilience have limitations, however. Online learning and teleworking have not been possible for all, nor have they substituted fully for traditional modes of education and work. Inequalities in access to digital resources have restricted the ability of individuals and businesses to benefit and they appear to have intensified inequalities in access to services, including gender-related inequalities. Progress towards the Sustainable Development Goals has slowed and, in some cases, been reversed.

4. Several lessons can be drawn. The pandemic has served to reinforce the importance of enabling affordable access to high-quality bandwidth and to digital resources and the services reliant thereon. Individuals and countries with high-quality affordable bandwidth

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 in Asian Tourism (ECPAT) International; Food and Agriculture Organization of the United Nations (FAO); Internet Corporation for Assigned Names and Numbers (ICANN); International Federation of Library Associations and Institutions (IFLA); Internet Society (ISOC); International Telecommunication Union (ITU); International Trade Centre (ITC); Office of the Secretary-General's Envoy on Technology; Organisation for Economic Co-operation and Development (OECD); UNCTAD; United Nations Children's Fund (UNICEF); United Nations Development Programme (UNDP); United Nations Department of Economic and Social Affairs (DESA); United Nations Educational, Scientific and Cultural Organization (UNESCO); United Nations Entity for Gender Equality and the Empowerment of Women (UN-Women); United Nations Environment Programme (UNEP); United Nations Industrial Development Organization (UNIDO); United Nations Office on Drugs and Crime (UNODC); United Nations Relief and Works Agency for Palestine Refugees in the Near East; World Bank; World Health Organization (WHO); World Intellectual Property Organization (WIPO); World Meteorological Organization (WMO); World Trade Organization (WTO). See <https://unctad.org/webflyer/2021-report-secretary-general-progress-made-implementation-and-follow-outcomes-world>.

Note: All websites referred to in footnotes were accessed in January 2022.

have been more likely to achieve resilience and less likely to experience adverse effects. The pandemic has served to demonstrate the value of data gathering, management and analysis in enabling societies to understand challenges, identify responses and make rapid adjustments. This is essential for both responding to immediate crises and planning recovery. The pandemic has also served to reinforce the importance of building strong relationships between science and public policy development, to enable innovation to contribute fully to resilience and sustainable development. Some risks associated with digital technologies have become clearer and addressing them, more urgent. The leveraging of personal data to support public health has demonstrated the importance of data protection and security. The infodemic identified by WHO² has reinforced the importance of disseminating information and countering misinformation and disinformation.

5. This will not be the last pandemic, and countries that have prepared strategic plans are better placed to ensure resilience and recovery. The current experience is demonstrating the importance of placing communications infrastructure, data management and online resources at the centre of crisis plans.

B. Climate change and the environment

6. Alongside the pandemic, the international community has been focused on the climate crisis, including through commitments made at the twenty-sixth session of the Conference of the Parties to the United Nations Framework Convention on Climate Change. The growing importance of digital technologies makes them central to efforts to fulfil those commitments and achieve climate stability and environmental sustainability.

7. The relationship between digitalization and the environment is complex and interactive. Advances in data-gathering and analytics enable Governments and businesses to improve efficiency and target resources, potentially reducing energy consumption. This contributes to the development of strategies to reduce carbon emissions and mitigate climate impacts.

8. Data corporations have moved towards the use of renewable energy sources for their operations and for data centres. However, the proliferation of devices, the growth of video and gaming markets, the deployment of new technologies based on artificial intelligence and the rapid growth of data traffic volumes also increase energy consumption. Frontier technologies such as autonomous vehicles and cryptocurrencies will accelerate this, and the long-term environmental impact of changes in behaviour, such as through teleworking, remains unclear. The proliferation and rapid turnover of common devices such as mobile telephones also contribute to problems of electronic waste.

9. These trends have helped to raise awareness of digital environmental sustainability, the goal of a new multi-agency initiative under the United Nations digital cooperation agenda.³ Sustainability strategies require Governments, international organizations and businesses to maximize the potential of datafication to enable energy efficiency and enhance the achievement of the Sustainable Development Goals. Governments and businesses need to incorporate environmental principles, energy efficiency and waste reduction into the design of digital infrastructure, hardware and services and into data management.

C. Development and changing technologies

10. The 15 years since WSIS have seen significant advances in information technology. The Internet has become the most important communications medium for many people, the basis for new forms of commerce and social interaction and a platform on which new business sectors have been built. It is, however, only part of a constellation of innovative technologies that rely on digitalization, including machine learning and artificial

² https://www.who.int/health-topics/infodemic#tab=tab_1.

³ <https://www.sparkblue.org/content/press-release-launch-new-global-initiative-advance-digital-environmental-sustainability>.

intelligence, algorithmic decision-making, robotics, virtual reality and quantum computing. Public attention has lately been drawn to the potential integration of virtual and physical reality, in what has been called a metaverse.

11. New developments in such technologies are constant. They have the potential to transform societies and economies more radically than the Internet alone and will interact profoundly with efforts towards achieving sustainable development. This potential is increasingly being explored by Governments, international organizations and businesses, and has been reinforced during the pandemic. Trends in frontier technologies, the relationship between human and digital development and the need for innovation with equity form the theme of the UNCTAD publication *Technology and Innovation Report 2021: Catching Technological Waves – Innovation with Equity*.

12. The World Bank, in *World Development Report 2021: Data for Better Lives*, identifies barriers to achieving technological potential, including the relationship between commercial and developmental goals in data management, incompatible data systems and the lack of public trust; and notes the need for a new social contract, that is, “an agreement among all participants in the process of creating, reusing and sharing data that fosters trust that they will not be harmed from exchanging data and that part of the value created by data will accrue equitably”.

13. Innovations in frontier technologies can change behaviour and alter social, economic and other norms before their implications have become fully apparent or been addressed by Governments. Concerns about potential risks have led to widespread discussions of the ethics of artificial intelligence. The concentration of digital innovation in a small number of countries has also raised concerns that countries will become dependent on a narrow range of suppliers for products and services increasingly essential to national prosperity. The United Nations and international organizations, including the Commission on Science and Technology for Development (CSTD), need to consider ways to ensure that frontier technologies respond to the interests of all countries and that capabilities in exploiting data for development are fairly distributed, for example through open-source information and communications technologies (ICTs), transparency and technology-sharing.

D. Data management and cybersecurity

14. The increasing role of data in development has increased attention to data management and governance. The responsibilities of data corporations towards users of services such as search engines and social media platforms, particularly regarding privacy, are widely discussed.

15. Some businesses hold more data than Governments about individuals in their societies. These data have both commercial and developmental value. Information about public health derived from them, for example, can help Governments and health providers identify problems and target resources, enhancing individual welfare, pre-empting epidemics, cutting costs and adding social and economic value. At present, consensus on arrangements for sharing data between commercial and developmental uses has not yet been reached. Effective means of anonymizing data are also required, to protect users from intrusion or surveillance.

16. There have been more intense debates concerning the international governance of data and data location. Some Governments and corporations wish to minimize restrictions on cross-border data flows. Others are concerned that this may jeopardize national interests or security and prefer at least some types of data to be retained locally. Governance models and ways of alleviating concerns are explored in the UNCTAD publication *Digital Economy Report 2021: Cross-Border Data Flows and Development – For Whom the Data Flow*.

17. Cybersecurity is fundamental in data management. The increased role of data across societies increases the risks of and risks linked to data breaches, particularly where these jeopardize essential services. Criminal attacks on both digital networks and individuals

have increased during the pandemic and are becoming more sophisticated.⁴ There are also concerns about disinformation and interference with democratic processes. International cooperation to maintain norms and improve standards of cybersecurity is a priority.

E. Digital cooperation

18. Progress has continued in implementing *Report of the Secretary-General: Road Map for Digital Cooperation*.⁵ The report served to emphasize the complex nature of the emerging digital society and its impact on every aspect of human development, societal and personal.

19. The growing pervasiveness and rapid evolution of ICTs cut across traditional boundaries in public policy, requiring new types of governance, regulation and partnership between Governments, businesses and civil society. The global nature of digitalization, in particular the cross-border character of online services and digital transactions, also affects the boundaries between national and international governance. Rapid and unpredictable change requires greater agility among stakeholders, including the capacity to integrate new opportunities with established international norms and targets, such as those related to human rights and sustainable development.

20. These trends require innovation in governance as well as in technology. The emergence of multi-stakeholder approaches, endorsed by WSIS, has facilitated decision-making and enabled the more effective exploitation of opportunities emerging from the information society. The complex and holistic character of digital development requires participation to also be multisectoral and multidisciplinary, linking the virtual opportunities identified through technology with the constraints identified through the social sciences and economics.

21. Multilateral governance should also evolve to take advantage of new opportunities for and risks to sustainable development. The proliferation of multilateral forums concerned with aspects of the digital society risks duplication and disharmony, while partnership and collaboration are essential to achieving common international goals. Multiple or competing decision-making spaces make it more difficult for developing countries to play a full role in decision-making. The United Nations agenda for digital cooperation seeks to build cohesion and consensus and will form a crucial part of the review of WSIS outcomes in 2025.

II. Implementation and follow-up at the regional level

A. Africa

22. Connectivity in Africa remains lower than in other regions, yet ICT use is growing rapidly and has accelerated during the pandemic. ECA and the African Union are working with United Nations agencies and private sector partners to leverage ICT-related opportunities. ECA has launched an Africa-wide pandemic-related digital platform, in partnership with telecommunications businesses, to help Governments analyse requirements and direct resources in response to the pandemic.

23. UNESCO and the International Development Research Centre surveyed artificial intelligence priorities and capacity, stressing the need to strengthen ability in Africa to achieve gains from technology.⁶

⁴ <https://www.interpol.int/en/News-and-Events/News/2020/INTERPOL-report-shows-alarming-rate-of-cyberattacks-during-COVID-19>.

⁵ <https://www.un.org/en/content/digital-cooperation-roadmap/>; <https://digitalcooperation.org/>.

⁶ <https://en.unesco.org/news/unesco-launches-findings-artificial-intelligence-needs-assessment-survey-africa>.

24. The Digital Economy for Africa initiative of the World Bank has conducted 14 country-specific studies of contexts for infrastructure, platforms, financial services, skills and businesses, to inform World Bank lending.

25. The Policy and Regulation Initiative for Digital Africa is a joint project of the African Union, the European Union and ITU aimed at optimizing spectrums, harmonizing policy and regulation and enhancing stakeholder participation in Internet-related policymaking. The African Union is developing a data policy framework with support from Research ICT Africa.⁷

B. Asia and the Pacific

26. ESCAP has developed a draft action plan for implementation of the Asia-Pacific Information Superhighway, focused on regional cooperation towards connectivity for all, data and digital technology and applications.⁸ ESCAP has conducted case studies of meaningful connectivity in five countries and studies to evaluate improved cross-border connectivity in Central Asia and subregional Internet exchange points.

27. The World Economic Forum, in *Association of Southeast Asian Nations Digital Generation Report*, analysed the relationship between the pandemic and digitalization in six countries in South-East Asia.

C. Western Asia

28. ESCWA promotes development in online services and infrastructure in the Arab region. Challenges involve the availability and affordability of the Internet, particularly in the least developed countries and post-conflict countries; cybersecurity; gender and geographic digital divides; and policies related to innovation and investment. ESCWA worked with DESA, ITU, the League of Arab States, UNCTAD and UNESCO to organize the Digital Cooperation and Development Forum.⁹ With the League of Arab States, UNESCO prepared a digital agenda for consideration by the Arab Telecommunications and Information Technology Council of Ministers.¹⁰ In addition, UNESCO has helped build capacity for national digital development reviews in the region.

D. Europe

29. ECE coordinates the United Nations Centre for Trade Facilitation and Electronic Business, which develops trade facilitation recommendations and electronic standards for Governments and businesses. ECE published *Digital and Sustainable Trade Facilitation: UNECE Regional Report 2021* and *Supporting Innovative High-Growth Enterprises in Eastern Europe and South Caucasus: UNECE Policy Handbook*.

30. The Council of Europe prioritizes work on freedom of expression, privacy and data protection, cybersecurity, child protection and the media in the digital age and, with the Governments of Japan and the United States of America, organized a global symposium on human rights in the digital sphere.¹¹

31. The European Commission issued the 2030 Digital Compass, a programme for digital development in Government, business, skills and infrastructure following the pandemic; and proposed two legislative initiatives, a digital services act and a digital

⁷ <https://afroaware.com/data-policy-framework-in-africa-What-you-need-to-know>.

⁸ <https://www.unescap.org/our-work/ict-and-disaster-risk-reduction/asia-pacific-information-superhighway-platform>.

⁹ <https://www.unescwa.org/events/arab-forum-digital-cooperation-and-development>.

¹⁰ <https://archive.unescwa.org/publications/arab-digital-agenda-arab-information-communication-technology-sustainable-development>.

¹¹ <https://www.coe.int/en/web/freedom-expression/human-rights-in-digital-sphere>.

markets act, related to the conduct of large online platforms and a framework for the digital development.¹²

E. Latin America and the Caribbean

32. ECLAC serves as the technical secretariat for the digital agenda for Latin America and the Caribbean agreed by regional ministers in 2020, with the following focus areas: infrastructure; digital economy; digital government; inclusion and digital skills; emerging technologies; trust and digital security; regional digital market; and digital regional cooperation.¹³ ECLAC published reports on digital technologies for a new future, focusing on social welfare and inclusion, productive development and digital governance; and regional indicators of digital technology adoption.¹⁴ In addition, ECLAC assessed investment trends with reference to fifth-generation technology; supported subregional digital development plans and provided analytical tools concerning the digital transformation of microenterprises and small and medium-sized enterprises; and aims to establish a regional observatory for digital development to consider new metrics and guidelines for policy development.¹⁵

III. Implementation and follow-up at the international level

A. United Nations Group on the Information Society

33. The Group coordinates the inter-agency implementation of WSIS outcomes across the United Nations system and has launched a dialogue on the role of digitalization in the decade of action to implement the Sustainable Development Goals.¹⁶

B. General Assembly and Economic and Social Council

34. The General Assembly adopted a resolution on ICTs for sustainable development.¹⁷ The Economic and Social Council adopted the resolution “Socially just transition towards sustainable development: The role of digital technologies on social development and well-being of all”.¹⁸

C. Commission on Science and Technology for Development

35. At its twenty-fourth session, CSTD focused on science, technology and innovation (STI) for health and on harnessing blockchain for sustainable development; and proposed resolutions on the implementation of WSIS outcomes and STI for development.¹⁹ During the intersessional panel meeting, CSTD focused on industry 4.0 for inclusive development and STI for sustainable urban development in the post-pandemic world.²⁰

¹² <https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX%3A52021DC0118>;
https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age/europes-digital-decade-digital-targets-2030_en; <https://digital-strategy.ec.europa.eu/en/policies/digital-services-act-package>.

¹³ <https://www.cepal.org/en/publications/46440-digital-agenda-latin-america-and-caribbean-elac2022>.

¹⁴ <https://www.cepal.org/en/publications/46817-digital-technologies-new-future>;
<https://www.cepal.org/es/publicaciones/46766-datos-hechos-la-transformacion-digital-informe-principales-indicadores-adopcion>.

¹⁵ <https://www.cepal.org/es/publicaciones/47147-la-inversion-extranjera-directa-america-latina-caribe-2021>; <https://www.cepal.org/es/publicaciones/47183-transformacion-digital-mipymes-elementos-diseno-politicas>; <https://www.cepal.org/es/proyectos/observatorio-regional-desarrollo-digital>.

¹⁶ <https://unctad.org/topic/ecommerce-and-digital-economy/ungis-dialogue>.

¹⁷ A/RES/76/189.

¹⁸ E/RES/2021/10.

¹⁹ E/CN.16/2021/2; E/CN.16/2021/3; E/2021/31-E/CN.16/2021/4.

²⁰ <https://unctad.org/meeting/cstd-2021-2022-inter-sessional-panel>.

D. Facilitation and coordination of multi-stakeholder implementation

36. WSIS Forum 2021 was held with the theme of “ICTs for inclusive, resilient and sustainable societies and economies”. Over 50,000 participants from 185 countries took part in about 250 online sessions held over a four-month period. Sessions were focused on youth and the elderly, people with disabilities, gender mainstreaming, cybersecurity and emerging technologies for sustainable development. The final week included a ministerial-level round table, interactive high-level dialogues and a prize-giving ceremony.²¹ Over 1,000 initiatives that leverage ICTs for developmental outcomes were added to the WSIS stocktaking platform.²²

37. The Broadband Commission, in *The State of Broadband Report 2021*, addressed people-centred approaches for universal broadband connectivity. UNESCO and Nokia co-chair a Commission working group for developing recommendations on digital transformation and capacity development in artificial intelligence in developing countries; other working groups are considering smart devices and virtual health and care.²³ UN-Women and the Governments of Canada and Mexico are leading discussions on a common understanding and assessment framework for digital inclusion, coordinated by the Office of the Secretary-General’s Envoy on Technology. In addition, the Equals Global Partnership of United Nations entities and sectoral agencies seeks to close gender-related digital divides in access to and leadership within the ICT sector.

E. Civil society, business and multi-stakeholder partnerships

38. Many activities that support WSIS objectives are implemented by civil society, businesses and academic and technical communities, as well as through multi-stakeholder partnerships.

39. IFLA worked with libraries to support their contribution to digital access and engagement during the pandemic, reviewed the role of libraries in building digital skills and assessed cooperation with municipalities to support digital rights and inclusion.

40. ISOC, in *Action Plan 2021: Empowering People to Create a Bigger and Stronger Internet*, focused on strengthening the Internet, empowering effective use and regulatory issues; and, in an Internet impact assessment toolkit, suggested ways of assessing the impact of policies and trends on the technical foundations of the Internet.²⁴

41. APC, an international network of civil society organizations concerned with development, rights and gender, focused on financial exclusion, responding to digitally mediated threats to human rights and building awareness of the Internet during the environmental crisis.

42. The Digital Public Goods Alliance is a multi-stakeholder initiative that seeks to accelerate achievement of the Sustainable Development Goals in low-income and middle-income countries by facilitating the development and utilization of and investment in digital public goods.

43. The Global System for Mobile Communications (GSMA) Association represents mobile communications businesses and publishes extensive research on the deployment of mobile communications, their impacts and their values for development.

²¹ <https://www.itu.int/net4/wsis/forum/2021/Home/Outcomes>.

²² <https://www.itu.int/net4/wsis/forum/2021/Files/outcomes/draft/WSISStocktakingReport2021.pdf>.

²³ <https://broadbandcommission.org/working-groups/>.

²⁴ <https://www.internetsociety.org/issues/internet-way-of-networking/internet-impact-assessment-toolkit/>.

F. Action lines and selected implementation of activities of United Nations entities

1. Implementation of action lines

44. Implementation of WSIS outcomes is aligned with implementation of the 2030 Agenda for Sustainable Development through General Assembly resolutions 70/1 and 70/125. In 2005, 11 action lines were agreed for multi-stakeholder implementation of the outcomes. Action line facilitators review implementation annually using an agreed matrix of the action lines and the Goals.²⁵ An online meeting of facilitators was held during WSIS Forum 2021.

(a) *The role of public governance authorities and all stakeholders in the promotion of information and communications technologies for development (C1)*

45. The value of multilateral, multi-stakeholder and multidisciplinary engagement, as noted in *Report of the Secretary-General: Road Map for Digital Cooperation*. The President of the General Assembly held a high-level thematic debate on digital cooperation and connectivity under the theme “Whole-of-society responses to end the digital divide”.²⁶ The Commission for Social Development considered as a priority theme a socially just transition toward sustainable development and the role of digital technologies.²⁷

46. ITU activities are summarized in annual reports on contribution to WSIS outcomes.²⁸ ITU disseminated pandemic-response information through an online platform and included a pandemic response ICT case repository in the WSIS stocktaking platform.²⁹ Discussions during an online global event on emerging technology for connectivity and on capacity development considered sustainable cities and global partnerships and focused on requirements for helping the least developed countries, landlocked developing countries and small island developing States achieve the Goals on education, industry and infrastructure.³⁰ The AI[Artificial Intelligence] for Good Global Summit has become a year-round digital event, showcasing potential applications of new technology.

47. The World Bank, in *World Development Report 2021: Data for Better Lives*, noted the need for a new social contract; background documents addressed related challenges.³¹

48. The World Economic Forum published *State of the Connected World: 2020 Edition*.

(b) *Information and communication infrastructure (C2)*

49. ITU published *Economic Impact of COVID-19 on Digital Infrastructure and The Economic Impact of Broadband and Digitization Through the COVID-19 Pandemic: Econometric Modelling*; revised a study on pandemic in the Internet age; and held an economic experts round table, which considered the telecommunications industry in the post-pandemic world.³² UNCTAD, in *Technology and Innovation Report 2021*, emphasized the need for economic diversification alongside readiness and capacity to adopt frontier technologies.

²⁵ https://www.itu.int/net4/wsis/forum/2018/Files/documents/outcomes/WSISForum2018_WSIS-SDGSMatrix.pdf.

²⁶ <https://www.un.org/pga/75/wp-content/uploads/sites/100/2021/07/PGA-Letter-Summary-of-HLD-on-Digital-Cooperation-Connectivity.pdf>.

²⁷ <https://www.un.org/development/desa/dspd/united-nations-commission-for-social-development-csod-social-policy-and-development-division/csod59.html>.

²⁸ <https://www.itu.int/en/itu-wsis/Pages/Contribution.aspx>.

²⁹ <https://reg4covid.itu.int/>;

<https://www.itu.int/net4/wsis/stocktaking/Surveys/Surveys/Submit/15863048637525604>.

³⁰ <https://www.itu.int/en/ITU-D/Conferences/ET/2021/Pages/default.aspx>.

³¹ <https://wdr2021.worldbank.org/the-report/#background-research>.

³² <https://www.itu.int/en/myitu/Publications/2021/05/11/08/52/Pandemic-in-the-Internet-age;>
[https://www.itu.int/en/myitu/Publications/2021/05/11/08/10/The-telecommunication-industry-in-the-post-COVID-19-world.](https://www.itu.int/en/myitu/Publications/2021/05/11/08/10/The-telecommunication-industry-in-the-post-COVID-19-world)

50. OECD revised the recommendation on broadband connectivity.³³

51. GSMA noted that 94 per cent of the world's population is now covered by a mobile broadband network, but 43 per cent does not use mobile Internet; and, in *The State of Mobile Internet Connectivity 2021*, summarized the impact of the pandemic on mobile access and usage, with detailed analysis in five regional reports covering developing countries.³⁴

52. Several new projects on international connectivity have targeted underserved communities, including with regard to high-capacity undersea cables and low-earth-orbit satellites. The deployment of community networks for underserved communities is promoted by stakeholders, including APC and ISOC.

(c) *Access to information and knowledge (C3)*

53. The Multi-stakeholder Forum on STI for the Goals stated that digital access, defined as “having access to enough devices and speed and bandwidth to connect globally”, should be considered a fundamental human right and noted related priorities such as “bringing everyone online, ensuring that digital connectivity is enriching and meaningful and ensuring that everyone online is safe and secure”.³⁵ ITU and the United Nations Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States published *Connectivity in the Least Developed Countries: Status Report 2021*, including practical and policy recommendations. The Broadband Commission issued a manifesto on the global goal of universal connectivity, focused on connectivity, investment, regulation and capacity-building.³⁶ UNICEF published *What We Know About the Gender Digital Divide for Girls: A Literature Review*. WIPO, in *Technology Trends 2021: Assistive Technology*, used patent-related and other data to provide a knowledge base on innovation in assistive technology to support people with disabilities.

54. OECD adopted a recommendation on children in the digital environment, identifying tools to help children realize the opportunities and address the risks of digitalization.³⁷

55. The Alliance for Affordable Internet published a report on the costs of exclusion, concerning the economic consequences of the digital gender gap, and gathered data on device and mobile broadband pricing.³⁸

56. GSMA published *The Mobile Gender Gap Report 2021*, together with an explanatory document on methodology.³⁹

(d) *Capacity-building (C4)*

57. The pandemic has served to demonstrate the impact of the lack of digital skills and literacy on the take-up and effective use of new technology. Many capacity development initiatives, such as the ITU Centres of Excellence, moved from face-to-face to online delivery for most activities.

58. ITU published *Digital Skills Assessment Guidebook* and the ITU Academy is working with Cisco Systems on the Digital Transformation Centres initiative, to build the digital capacity of citizens, particularly in underserved communities. ITU and UNDP established a joint facility for digital capacity development to support *Road Map for Digital*

³³ <https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0322>.

³⁴ <https://www.gsma.com/r/somic/>.

³⁵ E/HLPF/2021/6.

³⁶ <https://www.broadbandcommission.org/manifesto/>.

³⁷ <https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0389>.

³⁸ <https://a4ai.org/research/costs-of-exclusion-report/>; <https://a4ai.org/research/device-pricing-2021/>;
https://a4ai.org/extra/baskets/A4AI/2020/mobile_broadband_pricing_gni.

³⁹ <https://www.gsma.com/r/gender-gap/>.

Cooperation, directing users to relevant ITU and UNDP programmes, identifying areas of unmet need and fostering efforts to address them.⁴⁰

59. The Council of Europe supports international capacity-building against cybercrime and helps member States develop tools for electronic government (e-government) and citizen participation.

60. The World Bank published the *Digital Skills: The Why, The What and the How* guidebook.

(e) *Building confidence and security in the use of information and communications technologies (C5)*

61. The pandemic has served to reinforce the importance of trust in online activity. The General Assembly adopted a resolution on countering the use of ICTs for criminal purposes.⁴¹ Discussions on issues related to ICTs and international security continued at the Open-Ended Working Group and Group of Governmental Experts of the Office for Disarmament Affairs. ITU updated the guide to developing a national cybersecurity strategy; published a new edition of the global cybersecurity index; and made available a database of cybersecurity resources related to the pandemic.⁴² UNICEF developed a manifesto on the case for better governance of children's data and revised the child rights impact self-assessment tool for mobile operators.⁴³ UNODC has increased legislative and capacity-building support for member States, addressing risks arising from darknets, the criminal exploitation of cybercurrencies, child sexual exploitation and human trafficking.

62. The Council of Europe published guidance on data protection during the pandemic; continued to address cybercrime under the Budapest Convention on Cybercrime; prepared a strategy on the rights of the child; and adopted a declaration on children's privacy.⁴⁴

63. ECPAT International continued to advance child protection online.

(f) *The enabling environment (C6)*

64. ITU hosts information portals and resources on regulatory issues; the twenty-first Global Symposium for Regulators included regional events and culminated in a global forum on "Regulation for digital transformation: Accelerating inclusive connectivity, access and use", including a leadership debate oriented towards the quadrennial World Telecommunication Development Conference, to be held in 2022 under the theme "Connecting the unconnected to achieve sustainable development".⁴⁵ In addition, ITU published *Emerging Technology Trends Concerned with Artificial Intelligence and Data for Development*. The UNDP Digital Strategy seeks to harness digital potential for development and UNDP Accelerator Labs support the design and deployment of innovative approaches to developmental challenges, including those arising during the pandemic. UNIDO and the Government of the United Arab Emirates organized the Global Manufacturing and Industrialization Summit on repurposing digitalization for prosperity.

65. The World Bank supports the development of regulatory agencies and policies on universal access, competition, interoperability and other regulatory challenges.

⁴⁰ <https://www.itu.int/en/mediacentre/Pages/cm29-2021-ITU-UNDP-Joint-Facility-Digital-Capacity-Development.aspx>.

⁴¹ A/RES/75/282.

⁴² https://www.itu.int/pub/D-STR-CYB_GUIDE.01-2018; <https://www.itu.int/en/ITU-D/Cybersecurity/Pages/global-cybersecurity-index.aspx>; <https://www.itu.int/en/action/cybersecurity/Pages/CYB4COVID.aspx>.

⁴³ <https://www.unicef.org/globalinsight/reports/better-governance-childrens-data-manifesto>; <https://www.unicef.org/reports/mo-cria-child-rights-impact-self-assessment-tool-mobile-operators>.

⁴⁴ <https://rm.coe.int/t-pd-bur-2021-6rev2-statement/1680a25713>; <https://www.coe.int/en/web/cybercrime/the-budapest-convention>; <https://www.coe.int/en/web/children/-/draft-council-of-europe-strategy-for-the-rights-of-the-child-to-be-examined-at-the-cdenf-plenary-meeting>; https://search.coe.int/cm/pages/result_details.aspx?ObjectId=0900001680a2436a.

⁴⁵ <https://www.itu.int/en/ITU-D/Conferences/GSR/2021/Pages/default.aspx>.

66. ICANN has assessed the impact of the pandemic on the domain name system.

(g) *Information and communications technology applications (C7)*

E-government

67. Data from diverse sources have proved vital in monitoring the pandemic and identifying effective responses. DESA prepared a compendium of digital government initiatives in response to the pandemic and undertook regional consultations for the 2022 United Nations e-government survey, to support efforts to address inequalities in online access to local and national government services.⁴⁶ The United Nations Global Pulse works with diverse partners to accelerate sustainable development and the responsible use of big data and artificial intelligence.

E-business

68. The pandemic has impelled businesses to increase the use of digital services to maintain activity. As a result, shares of ICT-related goods in merchandise trade and ICT-related services in service exports have increased.

69. Member States at the fifteenth session of the United Nations Conference on Trade and Development, with regard to the digital economy, stated that UNCTAD should strengthen the work on assisting developing countries to systematically assess their state-of-play and readiness to engage and integrate into the digital economy [and] support the strengthening of the collection and processing of available data in order to produce statistics and policy analysis in relation to the opportunities and challenges of digital economy; and provide analysis for the design of policies to seize the opportunities and address the challenges for capturing value in the digital economy and promote the development of infrastructure for digitalization.⁴⁷ UNCTAD, in *Digital Economy Report 2021*, focused on cross-border data flows and development, analysing approaches to data governance and recommending ways to balance economic efficiency, data protection and national security. In addition, UNCTAD published a global review of the impact of the pandemic, supported by studies undertaken by the Regional Commissions; and established a repository of pandemic-related trade information.⁴⁸ The eTrade for all partnership, coordinated by UNCTAD, promotes e-commerce policies and resources, including national strategies, infrastructure, legal and regulatory frameworks, trade logistics, payment systems, skills and financing. The associated eTrade for women and ITC She Trades initiatives help women entrepreneurs engage in the digital economy.⁴⁹

70. ECE facilitates the digitalization of international transport arrangements, supporting the paperless cross-border transit of goods, and has adopted a road map for intelligent transport systems.⁵⁰ ECLAC published a report on post-pandemic economic recovery, focused on opportunities for e-commerce and digital trade.⁵¹ The Universal Postal Union published *innovating Digital Financial Services for Posts*. WTO, in *Trade in Knowledge: Intellectual Property, Trade and Development in a Transformed Global Economy*, explored cross-border data flows.

71. The International Monetary Fund published papers on digital money and on the use of digital money for cross-border payments.⁵²

⁴⁶ <https://unpan.un.org/node/1182>.

⁴⁷ TD/541/Add.2.

⁴⁸ <https://unctad.org/webflyer/covid-19-and-e-commerce-global-review>;
<https://etradeforall.org/publications/covid-19-and-e-commerce-global-review/>;
<https://etradeforall.org/covid-19>.

⁴⁹ <https://unctad.org/topic/ecommerce-and-digital-economy/etrade-for-women>;
<https://sustainabledevelopment.un.org/partnership/?p=33503>.

⁵⁰ ECE/TRANS/2021/15.

⁵¹ <https://www.cepal.org/en/publications/46858-post-pandemic-covid-19-economic-recovery-enabling-latin-america-and-caribbean>.

⁵² <https://www.imf.org/en/Publications/Policy-Papers/Issues/2021/07/28/The-Rise-of-Public-and-Private-Digital-Money-462919>; <https://www.imf.org/>

72. GSMA, in *State of the Industry Report on Mobile Money 2021*, detailed the rapid growth in mobile money during the pandemic; published a mobile money policy and regulatory handbook; and introduced a mobile money prevalence index.⁵³

E-learning

73. UNESCO launched the Global Education Coalition at the start of the pandemic, including a Global Skills Academy aimed at improving employment prospects, particularly in science, technology, engineering and mathematics, alongside teacher training and girls' education. UNESCO, UNICEF and the World Bank launched Mission: Recovering Education to help provide tailored support to students after the pandemic.⁵⁴ UNICEF, through the Reimagine Education programme, aims to increase access to digital learning opportunities for children worldwide. Giga Connect is a global initiative of UNICEF and ITU to connect every school to the Internet.

E-health

74. WHO has led the United Nations system response to the pandemic, including efforts to spread knowledge and dispel misinformation, and maintains a directory of e-health policies. *Global Strategy on Digital Health 2020–2025* promotes the appropriate use of digital technologies through national strategies, stronger governance and people-centred initiatives; digital health round tables to support the strategy were held with the private sector and academia. WHO launched the Digital Clearinghouse platform for assessing digital health solutions; established a technical advisory group and roster of experts on digital health; and published guidance in *Ethics and Governance of Artificial Intelligence for Health* and guidelines on the responsible integration of digital technologies in health systems and on the digital documentation of COVID-19 certificates.⁵⁵ WHO and ITU launched an initiative to promote applications for mobile health.⁵⁶ In addition, the Broadband Commission published *Importance of ICT and Global Cooperation for Future Epidemic Management*. WHO and UNICEF launched the Digital Health Centre of Excellence to support pandemic response and recovery, including delivery of technical assistance to Governments on approaches to addressing the pandemic and post-pandemic health needs.⁵⁷ WHO and the Government of the United Kingdom of Great Britain and Northern Ireland developed a social media toolkit to assist health-care practitioners in addressing misinformation.⁵⁸

75. GSMA published *Health Systems, Digital Health and COVID-19: Insights from Bangladesh, Myanmar, Pakistan, Benin, Nigeria and Rwanda*.

E-employment

76. The pandemic has led to the rapid growth of teleworking, particularly in developed countries. Worldwide, however, many people have faced redundancy or been supported by furloughs and other programmes.

/media/Files/Publications/PP/2021/English/PPEA2021054.ashx;

<https://www.imf.org/en/Publications/Policy-Papers/Issues/2021/07/09/Central-bank-digital-currencies-for-cross-border-payments-461850>.

⁵³ <https://www.gsma.com/r/sotir/>; <https://www.gsma.com/mobilefordevelopment/resources/mobile-money-policy-and-regulatory-handbook-2/>;

<https://www.gsma.com/mobilefordevelopment/resources/the-mobile-money-prevalence-index-mmpi/>.

⁵⁴ <https://www.unicef.org/reports/mission-recovering-education-2021>.

⁵⁵ <https://who-dch.powerappsportals.com/en/>; <https://www.who.int/news/item/18-02-2021-from-paper-to-digital-pathway-who-launches-first-smart-guidelines>;

https://www.who.int/publications/i/item/WHO-2019-nCoV-Digital_certificates-vaccination-2021.1.

⁵⁶ <https://www.who.int/activities/Addressing-mobile-health>.

⁵⁷ <https://digitalpublicgoods.net/blog/unicef-and-who-launch-covid-digital-health-centre-of-excellence-to-support-global-goods-for-covid-19-response-and-recovery/>.

⁵⁸ <https://www.who.int/publications/m/item/a-social-media-toolkit-for-healthcare-practitioners---desktop>.

77. The Multi-stakeholder Forum on STI for the Goals noted that “digital labour platforms need to be covered by labour regulations to provide decent work”.⁵⁹ The International Labour Organization (ILO) published *World Employment and Social Outlook 2021: The Role of Digital Labour Platforms in Transforming the World of Work and Promoting Fair and Ethical Recruitment in a Digital World: Lessons and Policy Options*; and explored the employment potential of the digital economy for people with disabilities, in partnership with Fundación Once, and for young refugees.⁶⁰ The online labour index, launched at the Oxford Internet Institute, tracks online labour markets.

E-environment

78. At its seventh session, the Meeting of the Parties to the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention) adopted recommendations on the use of electronic information tools to inform environmental consultation and decision-making.⁶¹ UNEP, UNDP and partner organizations launched the Coalition for Digital Environmental Sustainability as part of the follow-up to *Road Map for Digital Cooperation*.⁶² UNEP shares environmental data through the World Environment Situation Room and has developed a framework for progress towards a global environmental data strategy aligned with United Nations objectives. The WMO information system uses geospatial and other ICT to share data on and analyses of weather and climate, which support the climate service information system. The World Meteorological Congress adopted a policy on enhancing international exchanges of Earth system data.⁶³ The E-Waste Coalition brings together six United Nations agencies to advocate, share knowledge and support the implementation of strategies to deal with electronic waste.⁶⁴

79. The AI [artificial intelligence] for Good Foundation launched the Intelligent Cities Assessment to help municipalities understand how artificial intelligence might affect their citizens. The World Wide Web Foundation and Alliance for Affordable Internet published *Sustainable, Universal Access to the Internet: Environmental Implications and Policy Choices*, including policy recommendations for environmental goals in broadband policy.

E-agriculture

80. The pandemic has increased pressure on food supply chains, jeopardizing progress towards related Sustainable Development Goals.

81. ECLAC published a report on digitalization and technological change in the agro-industry in Latin America and the Caribbean.⁶⁵ The FAO COVID-19 Response and Recovery Programme has seven priority areas, including data for decision-making; and FAO has supported an international platform for digital food and agriculture involving initiatives on affordable connectivity, digital skills for agricultural work and agri-food system support services.⁶⁶ FAO facilitates the e-Agriculture Community of Practice, which shares knowledge of agriculture and rural development and supports the development of e-agriculture strategies in developing countries; the Digital Village Initiative addresses rural hunger, poverty and inequality in Asia and the Pacific.⁶⁷ FAO and ITU are collaborating on

⁵⁹ E/HLPF/2021/16.

⁶⁰ https://www.ilo.org/global/topics/disability-and-work/WCMS_769852/lang--en/index.htm;

https://www.ilo.org/global/topics/youth-employment/publications/WCMS_816539/lang--en/index.htm.

⁶¹ <https://unece.org/environmental-policy/events/MoP7-MoPP4-JHLS>.

⁶² <https://www.unep.org/events/webinar/launch-coalition-digital-environmental-sustainability-codes>.

⁶³ <https://public.wmo.int/en/events/constituent-bodies/cg-ext2021>.

⁶⁴ <https://www.itu.int/en/ITU-D/Environment/Pages/Priority-Areas/E-waste-Coalition.aspx>.

⁶⁵ <https://www.cepal.org/es/publicaciones/46965-digitalizacion-cambio-tecnologico-mipymes-agricolas-agroindustriales-america>.

⁶⁶ <https://www.fao.org/partnerships/resource-partners/covid-19/en/>;
<https://www.fao.org/about/meetings/council/c1164/documents/en/>;
<https://www.fao.org/news/story/en/item/1338985/icode/>.

⁶⁷ <https://www.fao.org/asiapacific/perspectives/digital-villages/en/>.

a study of digital agriculture in sub-Saharan Africa. FAO and Zhejiang University published *Rural E-Commerce Development Experience from China*.

82. The World Bank studied the digital transformations of the agrifood system.⁶⁸

E-science

83. The Economic and Social Council adopted a resolution on proposals on ways to better leverage open-source technologies for sustainable development.⁶⁹ FAO, ILO, UNEP, WHO and WIPO collaborate with publishers in the Research for Life programme, which offers access for developing countries to scientific journals, books and databases. The UNESCO General Conference adopted a recommendation on open science aimed at widening access to scientific knowledge, as the urgency of and need for fostering equitable access had been proved during the pandemic.⁷⁰ The UN-Women Generation Equality Forum identified technology and innovation as a priority.⁷¹ and the Action Coalition on Technology and Innovation for Gender Equality aims to improve women's involvement in science, technology, engineering and mathematics and contribute to pandemic resilience.

(h) *Cultural diversity and identity, linguistic diversity and local content (C8)*

84. The year 2021 was the International Year of Creative Economy for Sustainable Development; digital technology is part of an enabling environment for promotion of the creative economy.⁷² UNESCO published reports on the impact of the pandemic on the cultural sector, detailing digital innovation in cultural heritage, creative industries, museums and cities. The Group of 20 ministers of culture, in the Rome Declaration, encouraged investments in technical and vocational training in culture-related employment.

85. Issues related to digital identity are widely discussed. The World Bank increased support through the Identification for Development programme, which now assists 49 countries. The World Bank, GSMA and Caribou Digital explored digital identity for women and girls through the Commonwealth Digital Identity initiative. GSMA published *Access to Mobile Services and Proof of Identity 2021*. ICANN has continued to promote the universal acceptance of multilingual domain names.

(i) *Media (C9)*

86. UNESCO, in *World Trends in Freedom of Expression and Media Development: Global Report 2021/2022*, urged support for independent journalism. Participants at the World Press Freedom Day global conference adopted the Windhoek+30 Declaration on information as a public good, including a free, independent and pluralistic media.⁷³ UNESCO supports the introduction of freedom of information laws, now enacted in more than 130 countries, and has developed survey methodology to monitor implementation; worked towards updated policy guidelines for development and promotion of government public domain information; conducted several studies of national media environments based on its media development indicators; and published a discussion paper on the safety of journalists.⁷⁴ UNESCO and the Office of the United Nations High Commissioner for Human Rights (OHCHR) launched a global drive for media freedom and the safety of journalists.⁷⁵

⁶⁸ <https://openknowledge.worldbank.org/handle/10986/35216>.

⁶⁹ E/RES/2021/30.

⁷⁰ <https://unesdoc.unesco.org/ark:/48223/pf0000379949.locale=en>.

⁷¹ <https://forum.generationequality.org/action-coalitions>.

⁷² A/RES/74/198.

⁷³ <https://unesdoc.unesco.org/ark:/48223/pf0000378158>.

⁷⁴ <https://en.unesco.org/programme/ipdc/initiatives/mdis>;
<https://unesdoc.unesco.org/ark:/48223/pf0000379589.locale=en>.

⁷⁵ <https://en.unesco.org/news/unesco-and-ohchr-launch-global-drive-media-freedom-and-safety-journalists>.

87. The Council of Europe continued to support the safety of journalists; develop analyses of the changing media environment; and consider recommendations on issues including content moderation and hate speech.

88. An International Fund for Public Interest Media was established by Luminate Group in response to the changing financial models of media organizations.

(j) *Ethical dimensions of the information society (C10)*

89. The Human Rights Council adopted a resolution on the promotion, protection and enjoyment of human rights on the Internet, including issues related to access, shutdowns and encryption.⁷⁶ The Council issued reports on the impact of new technologies on the promotion and protection of human rights in the context of assemblies; disinformation and freedom of opinion and expression, in the report of the Special Rapporteur on the promotion and protection of the right to freedom of opinion and expression; and the right to privacy in the digital age, focused on the widespread use of artificial intelligence.⁷⁷ The Committee on the Rights of the Child issued a general comment on children's rights in relation to the digital environment, considering both opportunities and risks.⁷⁸ OHCHR launched a resource hub on human rights and digital technology, providing access to relevant United Nations reports and decisions.

90. UNICEF and the Government of Finland developed guidance on policies respecting children's rights for the Global Forum on Artificial Intelligence for Children.⁷⁹ UN-Women published the *Online and ICT-facilitated Violence Against Women and Girls During COVID-19* policy brief and worked with partner agencies to develop guidelines on the use of safe technology in essential services.

91. The Council of Europe adopted a decision on human rights in the digital age and issued guidelines on facial recognition.⁸⁰

92. Access Now organized the tenth multi-stakeholder Rights Conference.⁸¹

93. There has been growing concern about the role of online platforms with regard to hate speech, misinformation and disinformation, particularly regarding the pandemic. An Inter-Agency Dialogue on Disinformation and Data Transparency was established through the Office of the Secretary-General's Envoy on Technology.⁸² The UNESCO General Conference adopted a recommendation on the ethics of artificial intelligence, intended to establish normative guidelines to ensure that artificial intelligence technologies benefit humanity as a whole, developed through multi-stakeholder consultation and contributions from the Inter-Agency Working Group on Artificial Intelligence.⁸³ UNESCO marked the International Day of Peace with a conference on countering online disinformation and hate speech; published an issues brief on transparency and accountability in the digital age; and launched a global dialogue on transparency and accountability.⁸⁴

94. With regard to artificial intelligence, DESA and the Office of the Secretary-General's Envoy on Technology published *Resource Guide on Artificial Intelligence Strategies*, including consideration of artificial intelligence ethics and technical standards. The Council of Europe prepared a feasibility study on a legal framework for the design,

⁷⁶ A/HRC/47/L.22.

⁷⁷ A/HRC/44/24; A/HRC/47/25; A/HRC/48/31.

⁷⁸ CRC/C/GC/25.

⁷⁹ <https://www.unicef.org/globalinsight/reports/policy-guidance-ai-children>.

⁸⁰ https://search.coe.int/cm/Pages/result_details.aspx?ObjectID=0900001680a28ddf;
<https://rm.coe.int/guidelines-on-facial-recognition/1680a134f3>.

⁸¹ <https://rightscon.summit.tc/catalog/course/rightscon-online-2021>.

⁸² <https://www.un.org/techenvoy/content/digital-human-rights>.

⁸³ <https://en.unesco.org/artificial-intelligence/ethics>.

⁸⁴ <https://en.unesco.org/events/countering-online-disinformation-hate-speech-to-foster-peace>;
<https://unesdoc.unesco.org/ark:/48223/pf0000377231>.

development and application of artificial intelligence.⁸⁵ The World Economic Forum published *The Artificial Intelligence Governance Journey: Development and Opportunities* and *Designing Artificial Intelligence Technologies for Older Adults*. The Mozilla Foundation published a white paper on creating trustworthy artificial intelligence, addressing issues concerned with the role of major technology companies.⁸⁶

(k) *International and regional cooperation (C11)*

95. The COVID-19 crisis has been the primary focus of regional and international cooperation. The High-Level Political Forum considered sustainable and resilient recovery from the pandemic.⁸⁷ *Our Common Agenda*, the report of the Secretary-General, proposed a Global Digital Compact to connect all people to the Internet, including all schools; avoid Internet fragmentation; protect data; apply human rights online; introduce accountability criteria; promote regulation of artificial intelligence; and manage digital commons as a global public good. The Office of the Secretary-General's Envoy on Technology plays a coordinating role within the United Nations system and has focused on implementation of *Road Map for Digital Cooperation*, developing workplans and actions concerned with universal connectivity, digital capacity-building, digital inclusion and other priorities; and working with other agencies on initiatives concerning road safety, online child protection and space-based connectivity. The Governments of Germany and the United Arab Emirates prepared an options paper on the future of global digital cooperation.⁸⁸ At the sixth ITU World Telecommunication/ICT Policy Forum, policymakers discussed technology in relation to the Sustainable Development Goals, the pandemic and policy challenges, with preparatory meetings held for the World Telecommunication Development Conference. At WTO, discussions continued on international arrangements for e-commerce.

96. Digital ministers from the Group of 20 countries issued a declaration on leveraging digitalization for a resilient, strong, sustainable and inclusive recovery, which identified actions to accelerate digital transformations, including with regard to consumer protection, digital identity and artificial intelligence. Ministers of the Group of Seven countries issued a declaration on working towards a "trusted, values-driven digital ecosystem", including interventions promoting secure, resilient infrastructure, cooperation on the free flow of data, Internet safety and cooperation on standards and competition.⁸⁹

97. Global Policy Artificial Intelligence is an online platform for facilitating cooperation between intergovernmental organizations concerned with artificial intelligence.

2. Implementation of themes

(a) *Financing mechanisms*

98. The Inter-agency Task Force on Financing for Development, in *Financing for Sustainable Development Report 2021*, assessed the impact of the pandemic on communications markets and noted concerns about potential implications for investment in innovation arising from reduced public finances and the loss of sector revenues. The Broadband Commission, in *The State of Broadband: People-Centred Approaches for Universal Broadband*, detailed lessons learned from the pandemic and the need for accelerated growth in broadband deployment, backed by investment-friendly regulation; and published *Twenty-First Century Financing Models for Bridging Broadband Connectivity Gaps*.

99. The World Bank coordinates the Digital Development Partnership, which seeks to strengthen the digital economy; priority work areas involve data and indicators, enabling environments for the digital economy, cybersecurity, inclusive Internet access, digital

⁸⁵ <https://www.coe.int/en/web/artificial-intelligence/-/the-feasibility-study-on-ai-legal-standards-adopted-by-cahai>.

⁸⁶ <https://foundation.mozilla.org/en/insights/trustworthy-ai-whitepaper/>.

⁸⁷ E/HLS/2021/1.

⁸⁸ <https://www.global-cooperation.digital/GCD/Redaktion/EN/Downloads/options-for-the-future-of-global-digital-cooperation.pdf>.

⁸⁹ <https://www.gov.uk/government/publications/g7-digital-and-technology-ministerial-declaration>.

government and mainstreaming digital services, applications and platforms. The Partnership increased lending leverage by some 50 per cent in 2021, to \$9 billion, and launched a new cybersecurity multi-donor trust fund. The World Bank supports digital development through financing mechanisms such as the International Finance Corporation and the Multilateral Investment Guarantee Agency; initiatives in 2021 focused on pandemic responses; support for the Digital Economy for Africa initiative; and regional programmes in Latin America and the Caribbean and in South Asia.

(b) *Internet governance*

100. The Tunis Agenda for the Information Society recognized the need for enhanced cooperation on international public policy issues pertaining to the Internet. The General Assembly noted the work of the CSTD Working Group on Enhanced Cooperation and the need for continued dialogue.⁹⁰

101. The sixteenth meeting of the Internet Governance Forum (IGF) was held as a hybrid event in December 2021, including a physical meeting in Katowice, Poland. The overarching theme, “Internet united”, was associated with two focus areas (economic and social inclusion and human rights; universal access and meaningful connectivity) and four emerging and cross-cutting issues (emerging regulation and market issues; environmental sustainability and climate change; inclusive Internet governance and digital cooperation; issues of trust, security and stability). The Working Group on IGF Strengthening and Strategy under the IGF Multi-stakeholder Advisory Group considered ways of enhancing the role and performance of IGF in line with proposals in *Road Map for Digital Cooperation*.⁹¹ Best practice forums on cybersecurity and on gender and digital rights, as well as 22 dynamic coalitions on a variety of issues, undertook intersessional work in 2020–2021, and policy networks, facilitated by multi-stakeholder working groups, were established on the environment and meaningful access.⁹² National and regional IGFs play a growing part in IGF activity; 93 national, 19 regional and 23 youth IGF initiatives work with the global IGF secretariat through virtual meetings and an agreed workplan.⁹³

(c) *Measuring information and communications technology for development*

102. The Partnership on Measuring ICT for Development brings together 14 United Nations and international agencies concerned with data collection and analysis, assesses trends and proposes indicators to improve measurement with regard to the information society; it noted concerns with regard to the mismatch between existing statistical capabilities and the need to address the impact of data on development.⁹⁴ ITU maintains the World Telecommunication/ICT Indicators database, which includes data from over 200 economies under more than 180 indicators.⁹⁵ The UNESCO Internet universality indicators provide a framework for assessing national Internet environments under rights, openness, accessibility; multi-stakeholder participation; and cross-cutting issues. National studies have been completed or are under way in 33 countries. The United Nations Capital Development Fund has developed an inclusive digital economy scorecard to support countries in monitoring national digital development. Under IGF, a dynamic coalition was formed to share experiences. The International Monetary Fund developed a new index to measure digital financial inclusion.⁹⁶ OECD published *A Road Map Towards a Common Framework for Measuring the Digital Economy*. The GSMA mobile connectivity index measures mobile infrastructure, affordability, consumer readiness, content and services in over 150 countries.

⁹⁰ A/RES/75/202.

⁹¹ <https://www.intgovforum.org/en/content/mag-working-groups>.

⁹² <https://www.intgovforum.org/en/content/thematic-intersessional-work>.

⁹³ <https://www.intgovforum.org/en/content/igf-regional-and-national-initiatives>.

⁹⁴ <https://www.itu.int/en/ITU-D/Statistics/Pages/intlcoop/partnership/default.aspx>;

<https://sustainabledevelopment.un.org/index.php?page=view&type=30022&nr=2721&menu=3170>.

⁹⁵ <https://www.itu.int/en/ITU-D/Statistics/Pages/publications/wtid.aspx>.

⁹⁶ <https://www.imf.org/en/Publications/WP/Issues/2021/03/19/Digital-Financial-Inclusion-in-Emerging-and-Developing-Economies-A-New-Index-50271>.

IV. Findings and suggestions

103. There have been significant transformations in the 15 years since WSIS. A majority of people worldwide now have at least some degree of access to the Internet, and many rely on online services, such as search engines and social media platforms, for information, entertainment and other aspects of daily life. Much of the activity of Governments and businesses is now driven by digitalization and online services. Significant progress has been made towards, and beyond, the information society envisaged at WSIS, yet such progress has remained highly unequal. Concerns about digital divides reflected in WSIS outcome documents remain important, with particular attention being paid to the risk that unequal access to digital technology will exacerbate divides in access to other developmental goods, perpetuating social and economic disparities.

104. The technology and services that make up the information society differ greatly from those envisaged in 2005. Dramatic progress in mobile networks, cloud computing and data management, which have underpinned expanded access and usage of the Internet, have also fuelled the growth of social media, e-commerce and other platforms that have made the Internet a global marketplace. Increases in network and device capacity have enabled successive waves of innovation in digital technology that have significant potential for development, but that also pose risks to established rights and norms. The WSIS commitment to building “a people-centred, inclusive and development-oriented information society”, one that works for all humanity and leaves no one behind, should serve to emphasize these opportunities and risks, as stakeholders reflect on the implications and possibilities of digital transformation.

105. The pandemic has served as a reminder of the fragility of human life and existing threats to prosperity and sustainable development. Digital technologies have done much to help humanity through the pandemic, particularly by enabling continuity in commerce and employment, but the pandemic has also served to demonstrate the relationships between digital, social and economic inclusion and exclusion. Digital and socioeconomic inequalities are closely linked. Those who lack financial resources or experience discrimination are less likely to be digitally connected than others and those who lack digital connectivity are less able to access the resources that can lift them out of poverty and away from disadvantages. For this and many other reasons, digital policies cannot and should not be separated from the broader goals of economic prosperity and social welfare central to sustainable development.

106. The climate crisis and other environmental challenges faced by humanity are also linked with digital development. The world needs to make use of digital technologies to help reduce carbon emissions, limit the scale of climate change and mitigate already-occurring impacts. Technologists and businesses also need to respond by minimizing the negative environmental impacts of digital infrastructure, devices and services, to “green the Internet” and new technologies in future.

107. The pandemic and the climate crisis have illustrated the importance of cooperation in addressing challenges. At WSIS, Governments and other stakeholders achieved consensus on goals for the information society and mechanisms to facilitate what was then thought possible. Much progress has been made since, but there is also increasing concern that increasing international competition in digitalization and increased geopolitical tensions may inhibit the development of consensus and pose risks to international security.

108. The significant developments in technology that have taken place since WSIS and that are accelerating increase the need for cooperation between nations and stakeholders to ensure that the information society is people-centred, inclusive and development-oriented. CSTD and other entities have played important roles in identifying the challenges and opportunities involved. It is vital to build common goals in areas such as cybersecurity and artificial intelligence, to ensure that future developments serve humanity and do not threaten harm. *Report of the Secretary-General: Road Map for Digital Cooperation* is designed to foster cooperation between regions, countries, stakeholders and citizens in the common interests of humanity.

109. In 2025, the international community will review progress made in achieving the goals of WSIS in the light of experiences since the Summit and the overall commitment under the United Nations to achieving sustainable development. Many expectations at WSIS related to technology and services have been exceeded. The review will need to focus on the information society achieved and the frontier technologies that can be anticipated. Other aspects of the agenda emerging from WSIS have not substantially changed, particularly the need for digital equality and digital cooperation. There is much to be done in these areas before the review in 2025.
