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Review of the implementation of the 2030 Agenda for Sustainable Development in Asia and the Pacific and issues pertinent to the subsidiary structure of the Economic and Social Commission for Asia and the Pacific: information and communications technology, science, technology and innovation

Strengthening cooperation on emerging digital technologies through the Asia-Pacific Information Superhighway initiative and the Astana Ministerial Declaration on Digital Inclusion and Transformation in Asia and the Pacific

Note by the secretariat

Summary

Emerging technologies offer significant opportunities and challenges for accelerating digital inclusion and transformation in Asia and the Pacific.

In the Astana Ministerial Declaration on Digital Inclusion and Transformation in Asia and the Pacific, which sets out a regional vision on strengthened regional cooperation, the Executive Secretary was requested to commission an independent feasibility study on the role, structure and financing of a digital solutions centre for sustainable development to be established in Kazakhstan, to establish an ad hoc working group to review the outcome of the independent feasibility study and recommend a road map for strengthening the sharing of practical digital solutions for the Asia-Pacific region and to report on progress to the Economic and Social Commission for Asia and the Pacific at its eighty-first session.

In the present document, the secretariat highlights promising practices and cooperative actions for promoting innovative digital solutions for sustainable development in the Asia-Pacific region. In addition, it provides information on the progress made in implementing the above-mentioned requests contained in the Ministerial Declaration.

The Commission is invited to take note of the present document and provide further guidance to the secretariat on the implementation of the Ministerial Declaration.

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I. Introduction

1. Asia and the Pacific is a hub for digitally driven innovations with the potential to accelerate sustainable development. Emerging technologies, such as the use of artificial intelligence for advanced data analytics leveraging the Internet of things, offer transformative opportunities to bridge digital divides and foster an inclusive digital society. By strategically exploiting these technologies, the region is not only addressing long-standing challenges in digital inclusion but also driving digital transformation efforts that underpin sustainable development. As a result, the digital technology sector has played a pivotal role in opening up new product and service lines, driving economic efficiencies, higher productivity and economic growth in Asia-Pacific countries during the post-coronavirus disease (COVID-19) recovery period.

2. In section II of the present document, the secretariat presents innovative digital solutions for sustainable development, showcasing exemplary practices from Asia-Pacific countries for the Sustainable Development Goals. However, broader adoption of these solutions is limited by persistent challenges, such as inadequate infrastructure, digital skill gaps and the gender divide, particularly in rural areas. The secretariat underlines the critical need for investments in digital literacy and infrastructure to fully realize the potential of these technologies, together with international and regional collaboration efforts. In section III, the secretariat explores key international and regional collaboration initiatives. Such collaboration builds partnerships that help create synergies in capacity-building, knowledge-sharing and coordinated policymaking to overcome shared challenges, and the importance of regional partnerships built on a shared commitment at the highest policy decision-making level must be underlined. Section IV follows with an overview of the progress made under the Astana Ministerial Declaration on Digital Inclusion and Transformation in Asia and the Pacific, illustrating how such a joint initiative across the highest level of policy decision-making helps advance regional cooperation for digital solutions that promote inclusive digital transformation. In section V, the Economic and Social Commission for Asia and the Pacific (ESCAP) is invited to provide guidance on the issues highlighted.

II. Innovative digital solutions for sustainable development: policy insights from Asia-Pacific countries

3. Several Asia-Pacific countries have made significant progress in leveraging emerging digital solutions to advance sustainable development. Advanced data analytics, machine learning and generative artificial intelligence are driving transformational change by improving social, economic and environmental outcomes. These technologies have significantly enhanced healthcare through precise diagnostics, enabled telemedicine access to underserved areas and improved education with personalized content. The adoption of digital banking and insurance services has addressed gender and income inequalities, particularly benefiting women, small enterprises and rural communities. Below, selected exemplary practices are highlighted in a range of economic and social sectors that extend benefits to marginalized groups and promote sustainability across the Asia-Pacific region.

A. Innovation in agriculture

4. Digital transformation plays a crucial role in the agricultural sector by improving productivity, efficiency and market access. In Thailand, the National Agricultural Big Data Center enables data-driven decision-making,

helping increase crop yields and optimize resource management.[1] In India, the eNational Agriculture Market, a digital trading platform, connects over 1,000 regulated wholesale markets, promoting transparency and increasing farmers' sales and incomes.[2] These initiatives exemplify how digital technologies can transform traditional sectors to promote sustainable development.

B. Innovation in infrastructure

5. Digital technologies are driving innovation in the infrastructure and transportation sectors. In the maritime industry, the use of blockchain-based systems, such as the ChainPortal system in Busan, Republic of Korea, has optimized port logistics, reduced vessel waiting times and contributed to lower greenhouse gas emissions.[3] Similarly, digital twins have revolutionized infrastructure projects in Uzbekistan, where a private contractor, in partnership with the Asian Development Bank (ADB), promoted the application of this technology in highway construction. Digital twins enable visualization and simulation of scenarios, facilitate real-time data-sharing, improve resource efficiency and enhance sustainability by reducing environmental impacts and enabling predictive maintenance,[4] contributing to a reduction in greenhouse gas emissions.[5]

6. In the energy sector, sustainability is being advanced through smart grid technologies powered by the Internet of things. In the Philippines, a decentralized smart grid using cloud-based Internet of things optimizes village power distribution.[6] Blockchain technology, as seen in the Town Sukhumvit 77 project in Bangkok, facilitates efficient peer-to-peer energy trading.[7] The integration of rooftop solar panels, battery storage and network-enabled appliances is transforming power systems, particularly in small island developing States.

C. Innovation in financial services

7. Digital technologies are addressing disparities in the financial sector and improving access across the region. In Papua New Guinea, ADB and the Bank of Papua New Guinea co-launched a pilot project to implement a digital identification solution in rural areas to help improve financial inclusion for more than 2,500 individuals. The pilot project involved support for the development of an e-know your customer framework and the implementation

[1] For more information, see https://www.nabc.go.th/home.

[2] For more information, see https://enam.gov.in/NAMV2/home/about_nam.html#.

[3] Eleanor Hadland and Yesim Elhan-Kayalar, "Digitalization for decarbonization: evidence from Bangladesh, the Republic of Korea, and Sri Lanka", ADBI Working Paper Series, No. 1479 (Tokyo, Asian Development Bank Institute, 2024).

[4] Asian Development Bank, *Building Greener, Resilient, Transport Infrastructure: Innovating with Artificial Intelligence and Digital Twins in Road Design in Uzbekistan* (Manila, 2023).

[5] Eleanor Hadland and Yesim Elhan-Kayalar, "Digitalization for decarbonization: evidence from Bangladesh, the Republic of Korea, and Sri Lanka".

[6] International Energy Agency, *Unlocking Smart Grid Opportunities in Emerging Markets and Developing Economies* (Paris, 2023).

[7] Ksenia Petrichenko and Marco Schletz, "How can blockchain accelerate the SDG7 implementation?", ESCAP Blog, 5 June 2020.

of a regulatory sandbox for the Bank of Papua New Guinea.[8] Singapore has implemented various innovative programmes to ensure digital financial inclusion for vulnerable and at-risk groups. The Hawkers Go Digital programme provides cash incentives for street traders to adopt digital payments, and the Seniors Go Digital programme empowers seniors to use digital technology for e-payments to access government services.[9]

8. Another example of how digital innovation can enhance financial inclusion is illustrated by a project being implemented by the ESCAP secretariat and the National Research and Innovation Agency of Indonesia in Makassar and Bandung. The project has led to the development of a web-based slum area mapping tool that estimates potential recipients of government financial assistance through machine learning and remote sensing data.[10]

D. Innovation in government services

9. In Kazakhstan, the Digital Family Card, developed with United Nations Development Programme support, helps the Government identify and assist vulnerable families across sectors and more accurately and quickly identify people in need of various government support programmes. This Digital Family Card has benefited nearly 6 million families in its initial phase,[11] and the initiative won the 2024 GovTech Prize for Inclusive Digital Transformation at the World Government Summit in Dubai, United Arab Emirates.

10. Several Asia-Pacific Governments have launched national initiatives to drive digital transformation. The Smart Nation initiative in Singapore is focused on digital government services, the digital economy and the digital society to improve urban living. The Digital India programme ensures digital access and empowerment through initiatives like *Aadhaar* and digital payments. China has heavily invested in digital infrastructure, promoting smart cities, e-commerce and digital healthcare. The Digital Kazakhstan programme aims to transform various sectors through digitalization, while Mongolia launched its national digital vision, *Mindgolia*, in 2023.[12]

E. Innovation and the gender digital divide

11. Digital technologies are playing a pivotal role in bridging gender disparities in the digital economy by equipping women with the skills and tools needed to actively participate and compete in digital business ecosystems. The

[8] Asian Development Bank, “Unlocking the door to financial inclusion: the Papua New Guinea digital bank identification card pilot project” (Manila, 2023).

[9] Trevor Weltman and others, “Smart tourism ecosystem development readiness in Southeast Asia”, ADB Briefs, No. 296 (Manila, 2024).

[10] *Geospatial Practices for Sustainable Development in East and North-East Asia 2024: A Compendium* (United Nations publication, 2025).

[11] United Nations Development Programme, “Digitalisation for sustainable development and social well-being of society”, 13 February 2023.

[12] For further information on these national initiatives, see Singapore, Ministry of Communications and Information, “Smart Nation Singapore”, available at www.smartnation.gov.sg/; India, Ministry of Electronics and Information Technology, “Digital India”, available at www.digitalindia.gov.in/; Business Wire, “Digital China development report (2022) released, China’s digital economy ranks second in the world”, 30 April 2023; Kazakhstan, Electronic Government of Kazakhstan, “Digital Kazakhstan”, available at https://egov.kz/cms/en/digital-kazakhstan; and Mongolia, Ministry of Digital Development and Communications, “Mindgolia”, available at https://mindgolia.mn/en/.

Women ICT Frontier Initiative, a capacity-building programme for digital transformation implemented by the Asian and Pacific Training Centre for Information and Communication Technology for Development, has supported thousands of women-owned micro- and small enterprises across the region by enhancing their skills in e-commerce, digital marketing, financial management and data analytics, enabling them to thrive in the digital economy. In Indonesia, the Ministry of Communication and Digital Affairs is preparing to scale up the Initiative, aiming to reach 25,000 women by 2025. In Thailand, the Initiative has expanded beyond its initial focus on women entrepreneurs, and the Ministry of Social Development and Human Security now offers it to young people, persons with disabilities and older persons, showcasing its inclusive approach. Similarly, relevant ministries and women's associations, such as the Ministry of Social and Family Development of Maldives, the Bangladesh Computer Council, and Sri Padmavati Mahila Visvavidyalayam and the Ubuntu Consortium of Women Entrepreneurs Associations in India, are integrating the Women ICT Frontier Initiative in their capacity-building initiatives for women entrepreneurs.

F. Innovation and disaster risk reduction

12. Digital technologies are also playing a transformative role in disaster risk reduction and transformative climate adaptation for climate resilience. Artificial intelligence is transforming early warning systems for floods, earthquakes and landslides through big data analytics. Sensor-equipped ocean bed fibre-optic cables enhance tsunami early warnings, as in the case of a cost-effective pilot system between Vanuatu and New Caledonia.[13] Similarly, the Government of India, through the Indian National Centre on Ocean Information Services under the Ministry of Earth Sciences is spearheading the deployment of a sensor-equipped fibre-optic cable system to enhance ocean climate research and early warning for tsunamis and storm surges in the Nicobar Islands. Other similar initiatives are under way, with the Government of Indonesia spearheading the planned deployment of a smart cable through the Makassar Strait connecting East Kalimantan and Mamuju in West Sulawesi. Project Koete, a commercial cable project connecting Perth and Darwin (Australia), Jakarta, Singapore and Malaysia, is planned to include environmental sensors as well. Such advancements cost-effectively improve disaster prediction and expand early warning access, allowing those with reliable digital connectivity to take proactive risk reduction measures.

13. Countries in Asia and the Pacific are also harnessing digital technologies to push new frontiers in space science, technology and their applications for disaster risk reduction and sustainable development. Upon the request of members and associate members,[14] a recent publication by the secretariat presents 100 geospatial applications selected for their contributions to disaster risk reduction and sustainable development.[15] The examples show that geospatial applications can play a critical role in driving progress towards achieving the Sustainable Development Goals in ways that are efficient, effective and equitable. Rising government and private investments in space applications infrastructure are leading to an increased supply of publicly available, accessible, affordable and actionable geospatial data, which can be

[13] For further information, see www.smartcables.org/.

[14] ESCAP/MCSASD/2022/3.

[15] *Geospatial Practices for Sustainable Development in East and North-East Asia 2024: A Compendium*.

further tapped to aid in accelerating disaster risk reduction and sustainable development.

14. The secretariat's long-standing Regional Space Applications Programme for Sustainable Development is an example of a regional cooperative effort that addresses existing barriers to adopting new digital innovations. Guided by the priorities set by countries in the Asia-Pacific Plan of Action on Space Applications for Sustainable Development (2018–2030), notably those on disaster risk reduction, it facilitates the exchange of knowledge, skills and good practices and the implementation of field projects to meet countries' needs for geospatial information, expertise and capacity development.

G. Challenges in the adoption of digital solutions

15. Despite these advances, the Asia-Pacific region also faces substantial barriers to adopting digital solutions. In rural and remote areas, inadequate infrastructure, including limited access to high-speed Internet and reliable electricity, hampers digital inclusion. Although 98 per cent of the region's population is covered by mobile or fixed networks, broadband penetration remains uneven, with South and South-West Asia and the Pacific lagging behind significantly.[16] A gender digital divide persists, where fewer women than men have access to the Internet and own mobile phones, particularly in South and South-West Asia. Additional gaps are evident across age, disability and geographic location, with rural residents, persons with disabilities and marginalized groups facing limited digital access and skills. Only 40 per cent of the Asia-Pacific population has basic digital skills, while an estimated 86 million workers across several Asia-Pacific countries require new skills to keep up with technological advancements.[17]

16. Addressing these barriers requires investments at scale in infrastructure, affordability and digital literacy programmes.[18] Such efforts are essential to ensuring that the digital transformation realizes its potential and serves as a catalyst for achieving the Sustainable Development Goals in the Asia-Pacific region.[19]

III. International and regional collaboration on innovative digital technologies for sustainable development

17. International and regional collaboration initiatives build partnerships that help create synergies in capacity-building, knowledge-sharing and coordinated policymaking for sustainable development.

18. In line with the Secretary-General's report entitled "Our Common Agenda",[20] and as outlined in decision 77/568 of the General Assembly, world leaders at the Summit of the Future adopted the Pact for the Future to address sustainable development, peace and security, global governance and digital

[16] *Asia-Pacific Digital Transformation Report 2022: Shaping Our Digital Future* (United Nations publication, 2022).

[17] AlphaBeta and Access Partnership, "Building digital skills for the changing workforce in Asia Pacific and Japan (APJ)", March 2022.

[18] Global System for Mobile Communications Association, *The Mobile Economy Asia Pacific 2023* (London, 2023), p. 47.

[19] Ibid.

[20] A/75/982.

cooperation.[21] Through the Pact, they reaffirmed the 2030 Agenda for Sustainable Development, prioritizing Sustainable Development Goal financing, climate action and sustainable practices. Key commitments set out in the Pact for the Future include the ethical use of emerging technologies, leveraging science, technology and innovation for development, and emphasizing youth participation, gender equality and human rights, and it includes mechanisms for national-level implementation and follow-up. Annexed to the Pact for the Future are the Global Digital Compact, to ensure that digital spaces are safer and more inclusive, and the Declaration on Future Generations, to promote long-term governance.[22]

19. The World Summit on the Information Society, which was held in two phases, the first in 2003 and the second in 2005, laid the foundation for advancing global cooperation on information and communications technologies. Subsequent 10- and 20-year reviews of the World Summit on the Information Society have further reinforced its objectives and outcomes. The World Summit on the Information Society Forum, held annually, continues to facilitate cooperation among global stakeholders, serving as a platform for exchanging information, best practices and lessons learned in implementing the World Summit on the Information Society action lines. When integrated with sustainability initiatives, this global framework has stood the test of time and proved useful in harnessing technological innovations for addressing climate-related and environmental challenges, enhancing collective progress towards sustainable development.

20. In its resolution 80/1, ESCAP encouraged all its members and associate members to strengthen regional and multi-stakeholder cooperation. It called for closer collaboration in promoting research and development in digital technologies and fostering human development and a culture of innovation and entrepreneurship. These efforts aim to expedite the implementation of the 2030 Agenda.

21. The Action Plan for Implementing the Asia-Pacific Information Superhighway Initiative, 2022–2026, serves as a blueprint for bridging the digital divide and accelerating digital transformation, with each action aligned with relevant Sustainable Development Goals and World Summit on the Information Society action lines.[23]

22. The eighth session of the Asia-Pacific Information Superhighway Steering Committee was held in Jeju, Republic of Korea, on 25 and 26 September 2024. At the session, the Steering Committee acknowledged the significant progress in implementation, which included the activities undertaken between November 2023 and September 2024 by the three working groups of the Asia-Pacific Information Superhighway initiative. The Steering Committee reaffirmed its commitment to advancing regional cooperation and supporting the implementation of the Astana Ministerial Declaration on Digital Inclusion and Transformation in Asia and the Pacific. Towards that end, it agreed to advance digital public services, explore the establishment of a matchmaking platform for businesses and solution providers and enhance artificial intelligence capacity-building programmes. The Steering Committee

[21] General Assembly resolution 79/1.

[22] Ibid.

[23] ESCAP, "Asia-Pacific Information Superhighway Initiative Progress Report, November 2023–September 2024", 2024. Available at: https://www.unescap.org/sites/default/d8files/event-documents/APIS%20Progress%20report%2020240909.pdf.

underscored the importance of ensuring safe and ethical artificial intelligence systems for sustainable development and emphasized the need for continued support in advancing digital transformation, particularly for countries in special situations.

IV. Progress made in implementing the Astana Ministerial Declaration on Digital Inclusion and Transformation in Asia and the Pacific

23. In its resolution 80/1, ESCAP requested the secretariat to facilitate regional cooperation among members and associate members with a view to fostering digital innovation for sustainable development and promoting inclusive digital economies and societies. In the resolution, ESCAP noted with appreciation the initiative of the Government of Kazakhstan on establishing a digital solutions centre for sustainable development to provide practical digital solutions in Central Asia and beyond. The proposed digital solutions centre is envisioned to promote the sharing of digital solutions to advance a sustainable, inclusive and resilient digital economy and society, in recognition of the transformative potential of digital solutions in accelerating the implementation of the Sustainable Development Goals.

24. Pursuant to ESCAP resolution 79/10, the Asia-Pacific Ministerial Conference on Digital Inclusion and Transformation was held in Astana from 3 to 5 September 2024, bringing together more than 1,000 participants, 62 of them at the ministerial level from 30 members and associate members of ESCAP. The participants adopted the Astana Ministerial Declaration on Digital Inclusion and Transformation in Asia and the Pacific, which sets out a regional vision on strengthened regional cooperation to bridge the digital divide, ensure the provision of digital skills training, strengthen digital connectivity, enhance digital trust, share effective policies, practices and lessons learned, and promote inclusive digital economies and societies. This will accelerate momentum in the Action Plan for Implementing the Asia-Pacific Information Superhighway Initiative, 2022–2026.

25. In the Astana Ministerial Declaration on Digital Inclusion and Transformation in Asia and the Pacific, the secretariat was requested to commission an independent feasibility study on the proposed digital solutions centre to be established in Kazakhstan, establish an ad hoc working group to review the study's outcomes and recommend a road map for strengthening the sharing of practical digital solutions for the Asia-Pacific region, while recognizing the need to avoid duplication of efforts vis-à-vis other regional institutions of the Commission and specialized organizations, and to report on its progress to the Commission at its eighty-first session.

26. As of January 2025, the secretariat had developed a draft terms of reference for recruiting qualified consultants to conduct the feasibility study, which was submitted to the Advisory Committee of Permanent Representatives and Other Representatives Designated by Members of the Commission for its consideration. An ad hoc session of the Advisory Committee was held on 6 December 2024 to collect comments and suggestions on the draft terms of reference from members of the Advisory Committee.

27. The terms of reference were subsequently finalized by the secretariat based on the comments received, and a consultant was recruited to conduct the independent feasibility study. The consultant was scheduled to visit Kazakhstan and Bangkok to conduct interviews and collect data in January and February 2025.

28. The secretariat also issued on 31 January 2025 a note verbale inviting members and associate members of the Commission to nominate representatives to the ad hoc working group.

29. Once the independent feasibility study is completed, the secretariat will coordinate the dissemination of the study's findings. The secretariat then plans to convene the first meeting of the ad hoc working group in the second quarter of 2025. The progress, recommendations and expected road map emerging from the work of the ad hoc working group will be submitted to the Commission at its eighty-second session for its further consideration and guidance.

V. Issues for consideration by the Commission

30. The Commission may wish to take note of the present document and provide guidance to the secretariat on the further implementation of the Astana Ministerial Declaration on Digital Inclusion and Transformation. Members and associate members of the Commission may also wish to share national policy perspectives and experiences on digital innovations and solutions for achieving the Sustainable Development Goals, including through the Action Plan for Implementing the Asia-Pacific Information Superhighway Initiative, 2022–2026.