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**Theme topic, “Leveraging digital innovation for sustainable development in Asia and the Pacific”:
subregional perspectives****Subregional perspectives on leveraging digital innovation for sustainable development****Note by the secretariat***Summary*

Digital innovation presents both opportunities and challenges for countries in Asia and the Pacific. While innovative technologies in critical areas such as food security and climate action can help accelerate implementation of the Sustainable Development Goals, the ability of countries to benefit from these technologies can be hampered by the digital divide, both within and between countries and subregions, resulting in an exacerbation of existing inequalities. The five subregions of the Economic and Social Commission for Asia and the Pacific each have their own unique set of strengths and challenges, with some countries seen as leaders of technological innovation in many fields while others struggle to provide access to affordable and reliable Internet connectivity. In this context, cooperation at the regional and subregional levels can help countries to address these challenges and strengthen their ability to maximize the benefits of digital innovation to achieve the Sustainable Development Goals.

In the present document, the secretariat provides a brief overview of the progress made towards the achievement of the Sustainable Development Goals and the challenges that remain and highlights how regional and subregional cooperation to leverage digital innovation can help achieve sustainable development.

The Commission is invited to take note of the present document and provide guidance for the future work of the secretariat in this regard.

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I. Introduction

1. Fostering the deployment of digital innovations can be a powerful driver to accelerate progress towards the achievement of the Sustainable Development Goals in Asia and the Pacific. Several countries in the region are leaders of digital technology and many others have pioneered digital innovations and applications across development sectors to reach and connect people at scale.

2. In leveraging digital innovation for sustainable development, countries can face complex and persistent barriers and challenges, often associated with underlying poverty and underdevelopment. Bridging and eliminating the digital divide within and across countries to enable everyone to benefit from digital innovation is a priority in line with the commitment to leave no one behind. Furthermore, given the increasing intensity and frequency of the effects of climate change, it is also imperative for digital innovation to be environmentally sustainable. Asia and the Pacific is a region prone to multiple climate-induced and other natural disasters. The use of digital tools and innovation has become increasingly important in addressing the challenges posed by such disasters, significantly enhancing preparedness, early warning systems, response coordination and recovery efforts. As climate-induced and other natural disasters are not bound by national borders, subregional cooperation is particularly relevant.

3. In the present document, the secretariat provides an overview of the challenges and opportunities that exist and examples of how digital innovation is being leveraged for sustainable development in each of the five subregions. It also provides recommendations for regional and subregional cooperation in that regard.

II. Subregional perspectives

A. Pacific

1. Overview of progress made towards achieving the Sustainable Development Goals

4. The Pacific small island developing States have still not fully recovered from the economic impacts of the coronavirus disease (COVID-19) pandemic. While there are strong signs of improvement in some countries and economic sectors, recovery is uneven. The subregion continues to struggle with global supply-side shocks, higher food and fuel prices and mounting debt burdens. The rise in the cost of living in these small economies, as well as the heavy reliance on imports in many of them, is not only affecting people's lives but also having an impact on the implementation of the Sustainable Development Goals.

5. While some significant accomplishments have been made at the national level, the Pacific as a whole has regressed on 6 of the 17 Goals, and it is unlikely that the subregion will achieve even 20 per cent of its targets by 2030 if it remains on the current trajectory. Escalating global conflicts, the climate emergency and widening social and economic inequalities are all contributing factors holding the Pacific back. The lack of progress has had different impacts on both economic and social progress in the subregion and constrained actions to address climate change and strengthen resilience to disasters. Digitalization initiatives and other efforts are critical to addressing these compounding challenges.

6. Progress has been made towards achieving Goals 1 (No poverty), 2 (Zero hunger), 3 (Good health and well-being), 4 (Quality education), 5 (Gender equality), 7 (Affordable and clean energy), 8 (Decent work and economic growth), 15 (Life on land) and 17 (Partnerships for the Goals), and a number of targets for Goal 1 are on track. In contrast, progress towards other Goals has stagnated, specifically Goals 6 (Clean water and sanitation), 11 (Sustainable cities and communities), 12 (Responsible consumption and production), 13 (Climate action) and 16 (Peace, justice and strong institutions). Furthermore, limitations in the availability of data and the ability to assess aggregate performance towards the Goals will continue to mask the progress being made in the subregion. For some Goals, strong national-level processes are needed to ensure that subregional-level measurement and assessment are possible. For that reason, the regional indicator framework and national Sustainable Development Goal tracker developed by the Economic and Social Commission for Asia and the Pacific (ESCAP) will significantly help to improve capacity and strengthen assessments across a broad spectrum of data and statistics, especially for vulnerable communities and marginalized groups.

2. Leveraging digital innovation for sustainable development

7. In terms of information and communications technology (ICT) and digital transformation, different parts of the Pacific are at different stages of development. Connectivity gaps must be bridged and policies need to be harmonized to support and advance digitalization in the subregion. Digital transformation, digital innovation and entrepreneurship, digital infrastructure, digital security and trust, digital capacity-building and skills development, and regional cooperation and representation have been identified as priority areas. Subregional organizations and national Governments are actively developing road maps and strategic frameworks to support ICT and scientific knowledge creation initiatives, with a view to improving peoples' livelihoods and opportunities for skills development.

8. The Pacific is increasingly becoming a hub for digital initiatives that have the potential to shape socioeconomic development strategies in the subregion and have a positive impact on climate action. More affordable and accessible digital technologies offer new opportunities for improving digital skills development, ICT connectivity and financial inclusion. To ensure that digital technologies support inclusive economic growth and the implementation of the Sustainable Development Goals, Pacific Governments are creating enabling environments, including regulatory institutions and frameworks to ensure that investments are directed at the development of infrastructure that raises the quality of skills training and supports innovation opportunities. To accelerate digital connectivity, ESCAP is leading the establishment of a Pacific Internet exchange point, which is expected to improve the quality and speed of Internet traffic in the Pacific islands. Under this initiative, ESCAP has been supporting the review of existing mechanisms and regulatory frameworks over the past few years, with a view to harmonizing national laws, operations and regulations for interoperability. By investing in this initiative, member States are pursuing a new set of sustainable development opportunities in the Pacific around the development and systematic roll-out of ICT infrastructure.

9. The promotion of digitalization can support the efficient delivery of public services, such as health and educational services, including distance learning. Digital transformation strategies provide an important platform for the advancement of climate action and disaster risk reduction efforts, by enabling the development of early warning systems, the sharing of best practices and expertise, and access to skills development programmes. With

the support of multilateral development banks and collaboration through public-private partnerships, Pacific Governments need to encourage innovation and develop the digital economy, including climate-smart digital trade. By digitalizing cross-border trade procedures, Pacific economies can speed up clearance processes and improve transparency in transactions. Following the accession of Tuvalu to the Framework Agreement on Facilitation of Cross-border Paperless Trade in Asia and the Pacific in 2022, there is momentum to utilize digital innovation and services to accelerate the introduction of new trade and investment policies and procedures, both within and beyond the Pacific.

10. With the growing expansion of digital technologies, Pacific Governments need to further strengthen partnerships with international organizations and private sector companies to invest in cybersecurity technology, build a skilled youth workforce, increase awareness-raising programmes to safeguard networks and users from cyberattacks and online fraud, and protect the delivery of public social services to safeguard people and their livelihoods. As an example, the University of the South Pacific has signed a memorandum of understanding with the private sector to establish a digital skills hub on its main campus in Suva.

3. Strengthening regional and subregional cooperation

11. Pacific countries are aligning their national development strategies with the ambitions of the 2030 Agenda for Sustainable Development and the 2050 Strategy for the Blue Pacific Continent, which sets out a long-term approach for Pacific countries to work together on seven key thematic areas, including technology and connectivity. ESCAP, along with the United Nations development system, is working closely with the Pacific Islands Forum Secretariat and other agencies of the Council of Regional Organizations of the Pacific to harness complementarities, synergies and opportunities for policy coherence with the 2050 Strategy and its implementation plan.

12. The Governments of the Pacific small island developing States are working to accelerate their development aspirations with concrete actions relating to investment in the six transitions needed to achieve the Sustainable Development Goals.¹ Subregional programming and cooperation are accelerating action in the areas of: the oceans-climate-health nexus; sustainable development financing, including climate finance for a just transition in line with Goal 7; digital transformation; gender- and disability-inclusive social development; and evidence-based policymaking, including through regional guidelines. Through the United Nations development system in the Pacific, ESCAP can support subregional initiatives and strategic frameworks by promoting synergies between digital technology and regional cooperation. In the United Nations Sustainable Development Cooperation Frameworks of Pacific countries, there is a well-established focus on the digital transformation dimension. By enhancing collaboration around new and emerging sustainable digital technologies, ESCAP can work with relevant development partners and Governments to build durable and effective partnerships and strengthen regulatory and operational frameworks at the subregional level.

¹ The six transitions are: (a) food systems; (b) energy access and affordability; (c) digital connectivity; (d) education; (e) jobs and social protection; and (f) climate change, biodiversity loss and pollution.

13. As the voice of communities and vulnerable groups in the Pacific, civil society organizations play a key role in the preparation of voluntary national reviews and their follow up. Governments are implementing plans and policies, including in the areas of digital skills upgrading and broadband Internet access. Subregional and national cooperation is being advanced through the sharing of good practices and lessons learned, in a way that ensures the protection of unique cultures and values.

B. East and North-East Asia

1. Overview of progress made towards achieving the Sustainable Development Goals

14. In East and North-East Asia, progress towards achieving the 17 Goals has been slow as the subregion continues to face acute challenges with regard to environment-related goals. The issue of inefficient use of resources persists, as reflected by the regression on Goal 12 (Responsible consumption and production). The subregion's worst performance is on Goal 13 (Climate action). China, Japan and the Republic of Korea account for more than 30 per cent of global greenhouse gas emissions. The subregion needs to increase its share of renewable energy sources in total energy consumption as measured under Goal 7 (Affordable and clean energy). The impacts of disasters, including climate-induced disasters, have undermined the subregion's progress towards Goal 1 (No poverty). While the subregion has progressed in lowering the share of the population living below the poverty line, disasters have caused people to suffer huge economic losses, exacerbating disaster-related poverty.

15. The subregion has improved its performance on Goal 11 (Sustainable cities and communities) in terms of addressing the concentration of fine particulate matter in urban areas. The subregion's performance on Goal 9 (Industry, innovation and infrastructure) is mixed. For instance, the subregion has performed well in addressing infrastructure needs, having achieved the target on mobile network coverage as a proportion of the population and seen a steady increase in passenger and freight volumes. However, the subregion continues to generate large quantities of carbon dioxide emissions from its economic activities, underscoring the need for broader adoption of environmentally sound industrial processes.

2. Leveraging digital innovation for sustainable development

16. A number of members and associate members in the subregion are ranked in the top 20 economies on the frontier technologies readiness index published by the United Nations Conference on Trade and Development,² which assesses economies on their preparedness to use, adopt and adapt frontier technologies based on five building blocks: ICT deployment, skills, research and development activity, industry activity and access to finance.

17. Countries in the subregion have refined their innovation policies over the years, creating an enabling environment for digital innovation to support sustainable development. The Government of China has outlined its innovation policies in its series of five-year plans, with an emphasis on scientific and technological innovation as crucial catalysts for economic growth and sustainable development. In Japan, the Government's sixth science,

² United Nations Conference on Trade and Development, *Technology and Innovation Report 2023* (Geneva, 2023).

technology and innovation basic plan and its integrated innovation strategy³ set out medium- to long-term objectives for science, technology and innovation policies aimed at achieving a resilient and sustainable society. Japan is also working towards “Society 5.0”, a vision to integrate technological advancements (including the Internet of things, artificial intelligence and robotics) with societal needs for the purpose of addressing challenges such as population ageing, health-care access and environmental sustainability. In the Republic of Korea, research and development spending is among the highest in the world at 4.9 per cent of gross domestic product (GDP).⁴ In 2020, Mongolia launched an initiative to build a “digital nation”, acknowledging the ICT sector as a transformative driver of the country’s economic development and setting a target of digitalizing 90 per cent of government services by 2024.

18. Digital innovation plays a pivotal role in the carbon neutrality policies of member States in the subregion, contributing to reversing the trend in progress towards Goal 13. The Government of China has focused on accelerating innovation in low-carbon industrial processes and digitally transforming the industrial sector, as outlined in its working guidance for carbon dioxide peaking and carbon neutrality. The Government of Japan has a climate change road map, which prioritizes innovation, technology, green finance and international cooperation for the business-led adoption of clean technologies, with a specific focus on energy efficiency through digital solutions, as underscored in the country’s green growth strategy. Under its strategy to achieve carbon neutrality by 2050, the Government of the Republic of Korea is committed to collaborating with the private sector, aiming to optimize energy usage and incorporate cutting-edge technologies. In Mongolia, the Government is actively seeking ways of making manufacturing more efficient and environmentally sustainable by promoting the use of technological innovations that are in line with standards for reducing carbon dioxide emissions.⁵

19. Digital innovation is contributing to a smooth and sustainable transition in the energy sector, accelerating progress towards Goal 7 in the subregion. The Government of the Republic of Korea has launched a green new deal that supports energy industries with the aim of speeding up the clean energy transition. The Korea Electric Power Corporation has a digital solutions research institute that is integrating data, network and artificial intelligence technologies to revolutionize the energy sector. Its initiatives include expanding software platforms, creating hyperconnected networks and developing artificial intelligence-based security systems, highlighting digital innovation as a core element in addressing the evolving challenges of the power industry. In Japan, as part of sector-specific investment strategies for the next decade, digital innovation is being prioritized in the energy sector to achieve decarbonization, economic growth and a stable energy supply through green transformation. The strategy involves creating resilient resource circulation systems and promoting digital investments, in particular in the semiconductor industry, with a focus on next-generation technologies to support both industry growth and decarbonization efforts, including in data

³ Japan, Cabinet Office, *Integrated Innovation Strategy 2023* (Tokyo, 2023).

⁴ Organisation for Economic Co-operation and Development, *OECD Reviews of Innovation Policy: Korea 2023* (Paris, 2023).

⁵ Mongolia, Secretariat of the State Great Hural, *Mongolia Sustainable Development Vision 2030* (Ulaanbaatar, 2016).

centres.⁶ In China, an action plan for energy technology innovation covering the period 2016–2030 includes initiatives in various areas of energy technology, with the aim of building a comprehensive energy technology innovation system and advancing goals involving digital technologies in energy efficiency and power grids.

20. Digital innovation contributes to achieving Goal 11 in the subregion by optimizing resource utilization, minimizing environmental impacts and improving overall sustainability. To improve the energy efficiency of buildings in Shanghai, China, a benchmarking exercise has been undertaken, using smart metering technology to identify buildings that need an energy efficiency retrofit. In Suwon, Republic of Korea, smart metering technology has also been used to promote awareness of consumption patterns, and an app-based points system is being used to reward consumers for reducing their carbon footprint by cutting their electricity consumption. Japan has also seen increased demand for smart energy network management systems that utilize digital innovations to balance energy production from renewables, energy storage and consumption through connected buildings. There are examples of building developments using networked technologies to balance energy output, storage and consumption across the country, including in Sado City, Kitakyushu City and Tokyo.

21. Innovative digital technologies have been used in air quality monitoring networks in East and North-East Asia to provide accurate data for effective air pollution management, which has contributed to addressing the concentration of particulate matter (Goal 11). China has a network of over 5,000 monitoring stations at various administrative levels, across which data is synchronized. Japan maintains a national network of approximately 1,900 air quality monitoring stations that share real-time data. Mongolia has a network of 42 air quality monitoring stations, and real-time air quality data is synchronized with the national meteorology agency. There are about 900 monitoring stations in the Republic of Korea, where real-time data is synchronized with a national air quality monitoring information system. In February 2020, the country also launched the Geostationary Environment Monitoring Spectrometer, the world's first geostationary satellite instrument dedicated to air quality monitoring, which covers North-East Asia, South-East Asia and part of southern India.

22. Technological advancements have bolstered transboundary cooperation initiatives on biodiversity and nature conservation, which are monitored under Goal 15 (Life on land). Real-time transmission networks using wireless communication technology enable prompt access to data by researchers, while automatic recognition algorithms and artificial intelligence models efficiently process vast volumes of information.⁷ Innovative approaches, such as the initiative of the Northeast China Tiger and Leopard National Park to use high-definition aerial photos and panoramic images to offer immersive virtual tours, can enhance public awareness of environmental conservation efforts by giving people an ecologically friendly way to explore national parks. Artificial intelligence-driven technology is also used for remote data collection in areas with challenging terrain, ensuring timely results and

⁶ Japan, Ministry of Economy, Trade and Industry, “Sector-specific investment strategies: compiled as effort for specifying investment promotion measures for the realization of GX”, 22 December 2023.

⁷ Zhishu Xiao and others, “Wildlife monitoring and research using camera-trapping technology across China: the current status and future issues”, *Biodiversity Science*, vol. 30, No. 10 (October 2022).

contributing to the conservation of elusive species. For example, a digital detection platform has been developed that uses artificial intelligence recognition technology to provide more precise information on snow leopards, which allows rangers and researchers to formulate effective protection strategies.⁸

23. Digital innovation has been used to address acute socioeconomic challenges in the subregion, in line with the commitment to ensure that no one is left behind. The Third Review and Appraisal of the Madrid International Plan of Action on Ageing in Asia and the Pacific highlighted the need to expand and harness scientific research, expertise and technology to address the social and health implications of ageing. China, Japan and the Republic of Korea have been actively promoting the application of technology for healthy ageing. In the Republic of Korea, artificial intelligence is being used to assist social workers in monitoring older persons: a system conducts automated check-up calls, carrying out basic conversations using natural and fluent language. Artificial intelligence also plays a significant role in diagnostics and monitoring, for example by alerting caregivers when monitored vital signs deviate from the normal range, as shown in the case study of the AnshinNet health management system in Japan.⁹ In the sphere of long-term care, automation is increasingly being used to afford older adults greater privacy and still ensure they receive prompt medical attention from caregivers.

24. Disaster risk reduction strategies are also increasingly reliant on emerging technologies. In Mongolia, digital technologies have been instrumental in monitoring and mitigating the impacts of natural hazards and climate change. Advanced data analytics and remote sensing technologies have enabled more accurate risk assessments, supporting better preparedness and response. ESCAP has supported the assessment of multi-hazard risk in the Democratic People's Republic of Korea by developing an interactive mapping tool that enables hazard, exposure and vulnerability information to be overlaid.

3. Strengthening regional and subregional cooperation

25. Several subregional mechanisms in East and North-East Asia can be utilized as entry points to further enhance cooperation on leveraging digital innovation for sustainable development.

26. The Trilateral Cooperation Secretariat oversees mechanisms for cooperation between China, Japan and the Republic of Korea on ICT, intellectual property rights, and science and technology, among others. Expanding cooperation beyond the trilateral partnership would further amplify the benefits. The trilateral partnership could utilize its "Trilateral + X" approach to expand cooperation to other countries in order to achieve common development objectives in areas such as sustainable economy, ecological and environmental conservation, disaster risk reduction, health and poverty alleviation. Given the comparative advantage in digital innovation enjoyed by these three countries, it would be of great benefit to see them pursue joint initiatives in those areas with countries in special situations in the subregion and the broader Asia-Pacific region.

⁸ Tencent, "Tencent's digital detection platform protects snow leopards", 2 June 2022.

⁹ *Leveraging Technology for the Madrid International Plan of Action on Ageing: Experiences of China, Japan and the Republic of Korea* (ST/ESCAP/2945).

27. The Greater Tumen Initiative is a joint mechanism of China, the Democratic People's Republic of Korea, Mongolia, the Republic of Korea and the Russian Federation. At the twenty-third meeting of its Consultative Commission on 7 December 2023, the States members of the Initiative issued the Shenyang Declaration, in which they endorsed a digital economy cooperation road map to strengthen cooperation, including in the areas of trade facilitation, investment and inclusive digital transformation. The States members of the Initiative could utilize the road map to initiate digital innovation pilot projects under regional frameworks. For instance, a project could be launched to promote digital trade in line with the Framework Agreement on Facilitation of Cross-border Paperless Trade in Asia and the Pacific, given that all of the States members to the Greater Tumen Initiative are also parties to the Agreement. Such a project would help Mongolia to address gaps in hard and soft infrastructure and accelerate its implementation of the Vienna Programme of Action for Landlocked Developing Countries for the Decade 2014–2024.

28. Existing cooperation mechanisms in the subregion could also serve as platforms to promote the use of digital innovation for sustainable development, in line with addressing the subregional priority areas of environmental sustainability, sustainable connectivity (trade, transport, energy) and resilient and inclusive societies. These mechanisms include subregional platforms facilitated by ESCAP, such as the North-East Asian Subregional Programme for Environmental Cooperation, which has adopted a multidisciplinary and multisectoral approach to address subregional environmental challenges in the areas of air pollution, nature conservation, desertification, land degradation, low carbon cities and marine protected areas. The North-East Asia Regional Power Interconnection and Cooperation Forum is another platform that could be used to reinforce engagements with member States to strengthen cooperation on technological applications to help increase the share of renewable energy in the subregion's total energy mix.

C. North and Central Asia

1. Overview of progress made towards achieving the Sustainable Development Goals

29. In North and Central Asia, progress towards achieving the Sustainable Development Goals has been hindered significantly by multiple crises, including the COVID-19 pandemic, geopolitical uncertainties and the food crisis, which have had a profound impact on the subregion's economies and people. Despite having achieved progress towards Goal 9 (Industry, innovation and infrastructure) and Goal 3 (Good health and well-being), the subregion continues to regress on Goal 13 (Climate action).¹⁰

30. In order for North and Central Asia to rapidly accelerate progress towards Goals and targets related to economic transformation and sustainable development, coordinated action is needed. The subregion's economies continue to experience structural challenges, such as an overreliance on primary commodities and a low share of high-technology industries. The impacts of climate change also expose the subregion to growing environmental risks and hazards and economic losses. While countries in the subregion have made strides in implementing climate commitments, challenges persist in collecting robust emissions data, enhancing capacities and expediting the

¹⁰ ESCAP, Asia-Pacific SDG Gateway. Available at <https://data.unescap.org/home> (accessed on 1 December 2023).

energy transition. Rising food prices and agricultural supply disruptions have exacerbated food insecurity, affecting vulnerable groups and remote communities in particular. Countries in the subregion lack the financial resources to achieve the targets of the Sustainable Developmental Goals as they grapple with limited fiscal capacity and macroeconomic uncertainty. Efforts are also needed to address the growing disparity in social and economic outcomes within and across countries and to improve access to information and digital technologies, for the most vulnerable groups in particular.

31. There is strong potential for digital development and technologies to enable a paradigm shift in the approach to connectivity, economic transformation and sustainable development in the subregion. Enhanced availability of digital services and increased adoption of digital technologies could help to ensure efficient and fair access to a wide range of health, education, social services and business opportunities, which could in turn narrow the current divide in health and education outcomes and facilitate access to decent jobs. Furthermore, innovative technologies, including artificial intelligence and the Internet of things, could have transformative impacts on the greening of the subregion, support informed decision-making and foster resilience and adaptability in the face of evolving development challenges. Future efforts in this area are therefore essential to accelerate action towards achieving the Goals in the subregion.

2. Leveraging digital innovation for sustainable development

32. Digital innovation plays a vital role in improving connectivity and enabling economic transformation for sustainable development, especially for the seven landlocked developing countries in North and Central Asia. Fully leveraging digital innovation requires increasing access to digital technologies, updating technology, creating an enabling environment and prioritizing transport, energy, agriculture and trade facilitation. The underdeveloped nature of the subregion's innovation finance ecosystem remains a major hurdle.

33. On the issue of digital connectivity, the subregion has made notable progress in improving access to digital technologies and narrowing the digital divide. The percentage of individuals using the Internet has increased from below 40 per cent in 2012 to over 80 per cent in 2021. Rates of fixed and mobile broadband subscriptions per 100 inhabitants stood at 20.1 per cent and 97.2 per cent, respectively, in 2021, both of which are above the respective Asia-Pacific averages.¹¹ Targeted government interventions, such as public digital infrastructure programmes focusing on rural areas, have enabled more affordable access to broadband. In terms of bridging the digital divide, Armenia has reduced the gender gap in Internet use and Kazakhstan has narrowed the socioeconomic gap in the use of digital payments. However, Internet affordability has worsened as a result of the economic crisis following the COVID-19 pandemic.

34. All countries in the subregion have adopted national digital programmes, strategies and policies to promote the digital economy and enhance e-governance. Governments have taken steps to increase the number of science and technology parks afforded favourable tax treatment and to provide researchers with incentives such as competitive salaries, research grants and opportunities for cooperation with international partners. Between

¹¹ *Asia-Pacific Countries with Special Needs Development Report 2023: Strengthening Regional Cooperation for Seamless and Sustainable Connectivity* (United Nations publication, 2023).

2012 and 2022, Azerbaijan and Uzbekistan considerably improved the regulatory environment for their information and telecommunications sectors, and Georgia continued to make good progress.¹² In Armenia, the alignment of its 2021–2025 digitalization strategy with its public administration reforms and the Sustainable Development Goals has facilitated a successful digital transformation in the health and agriculture sectors.¹³

35. There are substantial benefits to digitalizing transport corridors and the energy infrastructure in the subregion in terms of overcoming the barriers faced by landlocked countries and addressing climate change. Digitalized transit procedures could significantly reduce delays for freight transport at border crossings, thereby cutting transport costs and reducing carbon emissions from vehicles. The co-deployment of telecommunications and energy infrastructure, such as the planned deployment of submarine power and fibre-optic cables in the Black Sea, has the potential to enable the export of clean and renewable energy from the subregion. Moreover, the digitalization of infrastructure could improve the subregion's capabilities in the areas of climate adaptation, disaster risk reduction and emergency response.

36. Countries in the subregion have made agriculture a priority area for digitalization, given the size of their rural populations and the high number of people employed in the agriculture sector. Digitalization can increase agricultural productivity and improve the climate resilience of agriculture operations. For instance, digitalization initiatives have been introduced in Uzbekistan to improve irrigation systems, soil and field analysis and pest monitoring and to boost crop yields and quality. However, adopting more advanced digital technologies to facilitate climate-smart agriculture would require substantially reducing the digital divide between rural and urban areas.

37. Digital trade facilitation has been identified as a key lever to reduce trade costs, promote inclusive participation and cut energy consumption. Azerbaijan, the Russian Federation and Uzbekistan have made great strides in implementing digital trade facilitation measures. Currently, Azerbaijan, Kyrgyzstan, the Russian Federation, Tajikistan and Turkmenistan are parties to the Framework Agreement on Facilitation of Cross-border Paperless Trade in Asia and the Pacific.

38. To enhance the effects of digital trade facilitation and its positive impact on sustainable trade, it is also crucial to facilitate digital trade for e-commerce and improve the e-commerce environment. Most countries in the subregion have adopted specific e-commerce legislation or taken steps to incorporate e-commerce regulations in legislative frameworks governing advertising, telecommunications, marketing and sales. Several countries have partially implemented national strategies for cross-border e-commerce. However, countries in the subregion are lagging behind in incorporating digital provisions in trade and investment agreements and facilitating intraregional cooperation on digital economy agreements.

39. Lack of access to an innovation finance ecosystem remains a significant impediment to the incubation and scaling up of digital innovations in the subregion. Although the ICT sector has been attracting foreign direct investment to the subregion, the underdeveloped nature of its capital markets

¹² International Telecommunication Union, ICT Regulatory Tracker. Available at <https://app.gen5.digital/tracker/metrics> (accessed on 5 December 2023).

¹³ *E-Government Survey 2022: The Future of Digital Government* (United Nations publication, 2022).

has created obstacles. Furthermore, the early-stage commercialization of digital innovations is hindered by risk-averse lending practices, high interest rates and a lack of public funding and alternative financing sources, such as venture capital.

3. Strengthening regional and subregional cooperation

40. Subregional cooperation remains critical for North and Central Asia, given the strong reliance of landlocked developing countries on neighbouring countries and transit corridors for connectivity. Reinvigorated partnerships with development partners and civil society organizations will be essential to deliver innovative, inclusive and resilient solutions that address development challenges such as poverty, food insecurity, climate change and inequality, while strengthening national capacities to manage shocks and crises effectively.

41. Recognizing the transformative power of digitalization and technology, Governments in the subregion have committed to further developing digital infrastructure and to enhancing regional digital policy cooperation and capacity-building, as outlined in the conclusions and recommendations reached by the United Nations Special Programme for the Economies of Central Asia at its 2023 Economic Forum, held in Baku on 21 and 22 November. The Government of Kazakhstan, for example, offered to host the Asia-Pacific Ministerial Conference on Digital Inclusion and Transformation, to be held in Astana in September 2024, and proposed the establishment of a digital solutions centre for sustainable development to promote the understanding and use of digital tools.

42. Regional cooperation to enhance countries' digital infrastructure and connectivity remains a key priority, in particular with a view to building an enabling legal and regulatory environment and to harmonizing existing frameworks and standards. The Digital Agenda of the Eurasian Economic Union, which is aimed at creating a single digital economy and achieving associated digital dividends, is an example of the efforts being made to establish a public digital ecosystem in the subregion.

43. The private sector continues to play a pivotal role in mobilizing investments for digitalization and broader development objectives. Increasing financial inclusion, leveraging e-commerce opportunities and providing training on the use and application of new technologies are crucial for unlocking finance for inclusive and resilient growth, including in the digital economy.

D. South and South-West Asia

1. Overview of progress made towards achieving the Sustainable Development Goals

44. At the current pace of progress, South and South-West Asia is not on track to achieve any of the 17 Sustainable Development Goals by 2030. Furthermore, the subregion is regressing on Goals 13 (Climate action) and 14 (Life below water). Despite achieving substantial progress towards alleviating poverty, with Bhutan, Maldives and Türkiye having already eradicated extreme poverty, between 5 and 12 per cent of the population in Bangladesh, India and Pakistan still live below the international poverty line of \$2.15 per day. In most countries in the subregion, large gaps in access to basic services persist between those furthest ahead and those furthest behind, and inadequate social protection coverage remains a challenge. While the

subregion has been steadily improving on some indicators of food security, health and education, as evidenced by declining rates of infant mortality, malnutrition and stunting among children, and primary and secondary school enrolment, progress has been stagnant or inadequate on many indicators of Goals related to social development.

45. Accelerated action is also needed for the subregion to make progress towards Goals and targets related to economic and environmental sustainability. Recovery from the economic slowdown triggered by the COVID-19 pandemic continues to be hampered by global geopolitical conflicts and their impacts on energy markets, trade, inflation and food security, among others. Moreover, the increased frequency and severity of natural disasters is adversely affecting economic growth. Countries in the subregion are currently lagging behind in adopting disaster risk reduction strategies and implementing energy transition measures. Financial flows towards the implementation of the Goals are inadequate to meet the investment needs of the subregion, with the shortfall in some countries equating to more than 20 per cent of GDP per year. In addition to needing to mobilize financial resources, the subregion also needs to make progress on various targets related to the means of implementation, such as improved data availability. Progress must also be made in trade and technology and in leveraging the potential of partnerships for sustainable development.

46. One of the key factors underlying the subregion's lack of progress towards the Goals is its inability to leverage the full potential of digitalization to promote sustainable development. Only 42.1 per cent of the population in South Asia has Internet access, compared to the global average of 63.1 per cent.¹⁴ While most countries in South Asia have wide mobile network coverage, fixed broadband coverage – which is critical for virtual education and business operations – is limited and mostly of poor quality. All South Asian countries have single-digit fixed broadband subscription rates, except Maldives, where it stands at 10 per cent.¹⁵

47. There are stark digital divides, for example between genders, income groups, and rural and urban populations, that prevent public services from being equitably delivered through digital platforms. In South Asia, women are 15 per cent less likely than men to own a mobile phone and 42 per cent less likely to own a smartphone, as compared to a gender gap of only 2 per cent for both indicators in East Asia and the Pacific.¹⁶ Among those furthest behind in Afghanistan, Bangladesh and Pakistan, the Internet usage rate is under 5 per cent.¹⁷ In Nepal, close to 0 per cent of those furthest behind possess basic

¹⁴ Based on data from World Bank, World Development Indicators. Available at <https://data.worldbank.org/indicator/IT.NET.USER.ZS?locations=8S> (accessed on 29 January 2024). For measurement, Internet users are defined as individuals who have used the Internet (from any location and using any kind of device) in the last three months.

¹⁵ World Bank, *South Asia's Digital Opportunity: Accelerating Growth, Transforming Lives* (Washington, D.C., 2022).

¹⁶ Global System for Mobile Communications Association, *The Mobile Gender Gap Report 2023* (London, 2023).

¹⁷ ESCAP, "Leveraging digital innovation for inclusive and sustainable development in Asia and the Pacific", Social Development Working Paper, No. 2023/02 (Bangkok, 2023). Those left furthest behind are individuals living in households in the bottom 40 per cent of household wealth distribution, with lower education and over 35 years of age.

ICT skills, as compared to 15 per cent of those furthest ahead,¹⁸ while 20 per cent of women in India report that they do not know how to connect to the Internet versus 9 per cent of men.¹⁹

48. During the COVID-19 lockdowns, South Asia missed opportunities to remotely deliver education, public health services and social security benefits owing to a lack of Internet access and poor digital literacy.²⁰ Better access to digital services and wider penetration of digital technologies could promote the efficient and equitable delivery of a wide array of services, potentially playing an important role in reducing disparities in health and educational outcomes and in income levels. For instance, digital financial services have helped to quickly and efficiently promote financial inclusion. Future digital transformation developments in South and South-West Asia will therefore be critical for achieving progress towards the Goals.

2. Leveraging digital innovation for sustainable development

49. There is immense potential for South and South-West Asia to capitalize on digital innovation across the social, economic and environmental dimensions of social development. To this end, the subregion needs to address gaps in digital infrastructure, digital usage and digital skills, including disparities in access faced by women and marginalized groups. There is already evidence of digital innovation transforming the delivery of basic services in the subregion, in particular the expansion of access to marginalized groups and those in hard-to-reach areas.

50. Bhutan rapidly digitalized its vaccine management system to facilitate the roll-out of COVID-19 vaccinations, which enabled second-dose vaccinations to be delivered to more than 60 per cent of its population over a one-week period despite the country's difficult mountainous terrains. In Maldives, a satellite schooling hub was established in Malé to enable students from three islands to attend virtual lessons conducted by teachers in the capital with on-site facilitation support. In Nepal, a mobile application called Shuvayatra was created to consolidate migration-related information provided by experts, advocates and members of the Nepali diaspora, making the migration process smoother for individuals seeking work opportunities outside the country.

51. The development of government service platforms, digital identification systems and digital financial services has facilitated the expansion of social protection programmes while cutting transaction costs. In India, the Government's Aadhaar digital identification system, its Pradhan Mantri Jan-Dhan Yojana financial inclusion programme, which provides at least one basic banking account per household, and its direct benefit transfer programme were used to process some 7 billion benefit transactions. In Pakistan, the Government was able to rapidly roll out its Ehsaas emergency cash programme to 12 million low-income families during the COVID-19 pandemic due to the integration of its identification system, the national socioeconomic registry and its digital payments system. In Bangladesh, benefit recipients can have transfers sent to their mobile wallets, as financial service providers have integrated their systems with the country's automated clearing house. In Türkiye, the e-Devlet government service portal and the country's

¹⁸ Ibid.

¹⁹ World Bank, *South Asia's Digital Opportunity*.

²⁰ ESCAP, "COVID-19 and South Asia: national strategies and subregional cooperation for accelerating inclusive, sustainable and resilient recovery" (Bangkok, 2020).

integrated social assistance system have been used to boost outreach efforts and increase registration and enrolment in social protection programmes.

52. The proliferation of digital businesses and financial technology start-ups in South and South-West Asia has bolstered its economy. India has been referred to as the world's third largest start-up ecosystem, with linkages to global industry leaders and top universities; the country has also strengthened the enabling environment for start-ups, with its competition authorities having pursued digital antitrust cases against corporate giants. In Sri Lanka, technology clusters have been established around the country that include universities, technology institutes and private companies. However, the expansion of financial technology start-ups in the subregion remains constrained by insufficient funding, human resources and incubator and accelerator programmes, coupled with inadequate legal and regulatory frameworks for promoting innovation and competition in the digital economy.²¹

53. There is ample scope to leverage digitalization for increased trade in the subregion, including through the formulation of simpler, harmonized regulations to reduce trade costs for small businesses. The digitalization of customs and trade systems at borders would also substantially facilitate trade by shortening transit and clearance periods, thereby lowering costs. In addition, digital innovations in trade-related infrastructure would help promote trade in South and South-West Asia, in particular innovations for port operations, given that all countries in the subregion have deepwater terminals, except for landlocked Afghanistan, Bhutan and Nepal. There would also be much value in adopting smart port technologies for monitoring, systemizing and greening port operations, including port community systems, smart cargo-handling systems and integrated rail and barge platforms.

54. Countries in the subregion are data contributors and users of global and regional digital platforms that utilize frontier technologies for monitoring environment-related developments. These platforms include: the Global Environment Monitoring System for Air, the world's largest air pollution network, which tracks real-time air quality at the local level;²² the World Meteorological Organization Global Observing System, which detects, forecasts and provides warnings for severe weather phenomena;²³ and the Risk and Resilience Portal, an initiative of the Asia-Pacific Disaster Resilience Network that identifies risk hotspots of cascading hazards and provides information on climate adaptation priorities for countries in the region.²⁴

55. South and South-West Asian countries have been further building on and customizing digital applications for climate monitoring and action. Bangladesh, India, Nepal and Pakistan have started to use smart metering as part of their efforts to adopt smart grids for climate change mitigation. For more customized decision-making on climate adaptation measures, Maldives has developed a mapping tool that overlays downscaled data internal to its disaster management authority on top of curated data from the Risk and Resilience Portal. In Bangladesh, data from 6 million mobile phones were used

²¹ Ibid.

²² See www.unep.org/explore-topics/air/what-we-do/monitoring-air-quality.

²³ See <https://community.wmo.int/en/activity-areas/global-observing-system-gos>.

²⁴ See <https://rrp.unescap.org>.

to analyse the flow of displaced people following cyclone Mahasen, the findings of which provided useful insights for disaster planning.²⁵

3. Strengthening regional and subregional cooperation

56. Platforms for regional and subregional cooperation are critical for accelerating multi-stakeholder partnerships and cross-country collaborations in South and South-West Asia, particularly given the subregion's long-standing political complexities.

57. Subregional efforts to enhance cross-border connectivity and cross-border access to data infrastructure would reduce costs and better connect landlocked countries of the subregion. Countries would also benefit from the creation of an enabling environment for cross-border data flows and cross-border payments, including through the harmonization of legal and regulatory frameworks and the harmonization of payment systems to make them compatible. Cross-border cooperation on disaster-related information and planning would improve early warning systems for climate-induced hazards.

58. Twinning programmes at various levels of government have been proposed by both government and civil society actors in the subregion as an effective means for peer learning, knowledge transfer and the cogeneration of solutions.

59. An area of great potential for States members of the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation is the opportunity to engage in its newly formed science, technology and innovation sector and the corresponding expert group. Notably, countries could capitalize on the Initiative's upcoming technology transfer facility, which seeks to promote the transfer of technologies, in particular those appropriate for micro-, small and medium-sized enterprises, to enhance South-South cooperation.

E. South-East Asia

1. Overview of progress made towards achieving the Sustainable Development Goals

60. Not only is South-East Asia not on track to achieve any of the Sustainable Development Goals, but progress towards achieving Goals 12 (Responsible consumption and production), 13 (Climate action) and 14 (Life below water) has regressed. However, encouraging strides have been made towards achieving Goals 7 (Affordable and clean energy), 15 (Life on land), 9 (Industry, innovation and infrastructure) and 10 (Reduced inequalities). Like other subregions, South-East Asia faces compounded challenges caused by the COVID-19 pandemic and global geopolitical conflicts affecting inflation, food security and energy.

²⁵ Xin Lu and others, "Detecting climate adaptation with mobile network data in Bangladesh: anomalies in communication, mobility and consumption patterns during cyclone Mahasen", *Climate Change*, vol. 138 (August 2016).

61. Recognizing the transformative power of digital innovation, Governments in South-East Asia are actively prioritizing the development of digital infrastructure. The increasing prevalence of digital technologies, exemplified by high smartphone penetration rates and a robust e-commerce ecosystem, signals a shift towards digital inclusion and economic sustainability. Moreover, the emergence of artificial intelligence as a transformative force, with the capacity to reach remote communities, highlights the potential for technological advancements to bridge societal gaps.

62. Despite these steps forward, there are challenges requiring attention to ensure inclusive and sustainable progress. Unequal access to technology poses a risk of exacerbating existing social and economic disparities. Rural populations, specific demographic groups (including women and older adults) and lower-income populations often find themselves on the disadvantaged side of this divide. Addressing the gap requires targeted policy interventions, infrastructure development and initiatives fostering digital literacy and access. Furthermore, the rapid pace of technological change, in the area of artificial intelligence in particular, presents both opportunities and challenges for the subregion's workforce. While artificial intelligence has the potential to drive innovation and productivity, there are concerns about potential job displacement in some sectors.

63. Ultimately, a multifaceted approach is required to address the challenges in South-East Asia, with private sector companies and civil society organizations playing pivotal roles to harness the transformative potential of digital technologies in order to propel the subregion towards a truly sustainable and equitable future.

2. Leveraging digital innovation for sustainable development

64. Governments have been strategically prioritizing the integration of digital innovations and technologies, recognizing their potential as enablers to tackle the multifaceted challenges that impede progress towards the implementation of the Sustainable Development Goals. This approach involves leveraging data analytics for informed decision-making, implementing e-governance solutions for enhanced public service efficiency and championing digital inclusion initiatives to bridge socioeconomic disparities. Building digital literacy plays a crucial role in empowering communities, equipping them with the skills necessary to harness the vast benefits of technology, which extend to areas such as food security, nutrition and climate resilience, thereby strengthening their overall resilience.

65. In addition to government efforts, contributions from other sectors can amplify the positive impact of digital innovation. The private sector plays a vital role by investing in technology-driven initiatives, such as renewable energy projects, sustainable agriculture techniques and responsible supply chain management. Civil society organizations contribute by utilizing digital channels for online campaigns, data-driven advocacy and community engagement, pushing for inclusive and environmentally conscious policies. Academia plays an equally important role, with research and development centres focused on science, technology and innovation fostering further advancements in digitalization.

66. The emergence of artificial intelligence and its integration with broader digital innovation present a unique opportunity to accelerate progress towards realizing the 2030 Agenda. As new job opportunities emerge in programming and prompt engineering, there will be a critical need for skills development in these areas. Comprehensive education in new technologies will be imperative

for countries to bolster economic resilience and bridge the skills gap. Artificial intelligence also has the potential to benefit remote and underserved communities, in particular in areas such as education and agriculture, although it will be crucial to carefully consider the associated challenges. Using innovative approaches to technology for sustainable development can contribute to achieving equitable and sustainable food security and nutrition. Examples include utilizing modelling analyses to address barriers preventing vulnerable populations from having access to nutritious food and deploying artificial intelligence to detect illicit food products.

67. Just as technology can empower communities on issues of food security and education, it also has the potential to empower migrant populations in vulnerable situations. From bridging communication gaps to providing access to legal resources, technology can serve as a tool for ensuring inclusivity and protecting the rights of those whose contributions drive the subregion's economic growth. By recognizing the vulnerability of migrant populations, Governments and development partners can proactively apply innovative solutions to issues such as limited access to justice and human rights violations.

68. Looking ahead, the strategic integration of science, technology and innovation, mainly to explore the transformative capabilities of artificial intelligence in developing climate-focused technologies, has the potential to significantly accelerate the achievement of the Goals. Fostering an ecosystem that supports climate technology start-ups through funding, networks and training is vital to harnessing this potential. Collaborative efforts such as the upcoming digital economy framework agreement of the Association of Southeast Asian Nations demonstrate a collective vision for fostering digital economic growth and collaboration within the subregion, setting the stage for sustained development.

69. Striking a balance between technological progress and ethical, sustainable practices is crucial in order to reap the full potential of digital innovations. Equally important is effectively navigating the complex landscape of data privacy concerns to ensure the protection of individuals and communities in the digital domain.

70. The active embrace of digital innovation in South-East Asia underscores the subregion's commitment to addressing sustainable development challenges. Digital innovation has emerged as a crucial tool for sustainable development, with governments, the private sector, civil society and academia collaborating to integrate technology into policy frameworks and drive progress.

3. Strengthening regional and subregional cooperation

71. The status of progress towards achieving the Sustainable Development Goals in the subregion underscores the need for strategic interventions across the wider region in order to meet the deadline of 2030. Despite advancements on specific Goals, challenges persist, demanding a concerted effort for meaningful progress to be made. Considering the ongoing global crises and recognizing the escalating impacts of climate change, a comprehensive approach is imperative.

72. In summary, the subregion could focus on strengthening policy coherence; fostering public-private partnerships that promote sustainable practices and corporate social responsibility; instituting regulations that incentivize the private sector to contribute to the 2030 Agenda; advocating for inclusive decision-making forums that involve diverse stakeholders;

strengthening regional and national capacities for data monitoring and assessment, including investing in comprehensive capacity-building programmes for data-related skills; investing in digital infrastructure and promoting the research and development of technology solutions; developing policies that create an environment conducive to innovation and digital literacy; and collaborating on joint research initiatives and projects.

III. Issues for consideration by the Commission

73. The Commission may wish to reflect on the opportunities for leveraging digital innovation for sustainable development and the associated challenges and provide guidance to the secretariat on priority areas of work at both the subregional and regional levels, with a view to strengthening cooperation among subregions to maximize the benefits of new and emerging technologies.
