



Economic and Social Council

Distr.: General
14 February 2024

Original: English

Economic and Social Commission for Asia and the Pacific

Eightieth session

Bangkok, 22–26 April 2024

Item 4 (i) of the provisional agenda**

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 Commission: information and communications technology, science, technology and innovation

Leveraging digital technologies to accelerate the achievement of the Sustainable Development Goals

Note by the secretariat

Summary

The rapid pace of adoption of digital technologies across Asia and the Pacific presents a unique opportunity to leverage innovation in order to enhance the impact on sustainable development. New digital technologies, in particular those that expand access to education, skills development, start-ups and employment-generating business opportunities, have significant multiplier effects on sustainable development. Online government platforms and e-government services have the potential to make a particularly valuable contribution, by facilitating the efficient delivery of social protection benefits and generating additional revenue through innovative digital tax solutions.

Policies promoting digital innovation and inclusion are crucial for ensuring equitable access to the benefits of digital technologies and digital dividends. In that regard, it is vital to address structural obstacles to connectivity, in particular by accelerating investments in information and communications technology infrastructure. Expanding affordable and reliable Internet access to underserved areas, tailoring solutions to the diverse needs of marginalized groups and maximizing opportunities associated with online operations are essential steps towards achieving a more inclusive digital future.

In the present document, the secretariat builds on some of the issues contained in document ESCAP/80/2 to provide a more detailed overview of trends in digital connectivity, which is an essential foundation for the delivery of digital government services and digital inclusion in Asia and the Pacific. It also examines emerging good practices for the use of digital innovation and solutions for more inclusive and sustainable government services, with a focus on innovative digital tax solutions, effective social protection programmes and strategies for the provision of seamless, reliable, accessible and affordable connectivity to marginalized groups. Lastly, the secretariat outlines policy recommendations aimed at bridging the digital

* Reissued for technical reasons on 21 March 2024.

** ESCAP/80/1.

divide and accelerating the digital transformation with a view to achieving the Sustainable Development Goals.

The Economic and Social Commission for Asia and the Pacific may wish to take note of the present document and provide the secretariat with further guidance, including on encouraging members and associate members to share national policy perspectives and experiences on digital innovations, bridging the digital divide and accelerating the digital transformation to enhance the impact on the achievement of the Sustainable Development Goals.

I. Introduction

1. The accelerated pace of digital innovation, which was intensified by the coronavirus disease (COVID-19) pandemic, has caused a profound shift in the development paradigm. The ongoing digital transformation, driven by disruptive technologies such as artificial intelligence, cloud computing, digital twins, geospatial technologies and big data, extends beyond the mere digitalization of goods and services – the very fabric of value creation, management and distribution is being reshaped. While innovative digital technologies provide enhanced access to information, education, employment and health services, they also carry the risk of exacerbating existing inequalities, especially for marginalized communities.

2. Against this backdrop, the present document contains an assessment of key trends in digital connectivity, a cornerstone for accelerating digital transformation in Asia and the Pacific. It also contains an exploration of emerging good practices for leveraging digital innovation and solutions to create more inclusive and sustainable government services. It concludes with a discussion of policy recommendations and a presentation of issues for consideration by the Economic and Social Commission for Asia and the Pacific.

II. Key trends in digital connectivity

3. Asia and the Pacific is the region with the world's most pronounced digital divide. While a few high-income economies have surged ahead, establishing themselves as global frontrunners in the adoption of new digital technologies, the majority of low-income economies in the region have made minimal advancements in digital coverage, usage and diffusion over the past two decades.

4. Statistics from the International Telecommunication Union (ITU)¹ for the period 2017–2019 (the three years leading up to the COVID-19 pandemic) and the period 2020–2022 (the first three years of the pandemic) show significant variation in the state of digital connectivity across Asia-Pacific countries. On average, the Asia-Pacific region experienced a significant increase in Internet access rates and in Internet bandwidth usage between 2017–2019 and 2020–2022.

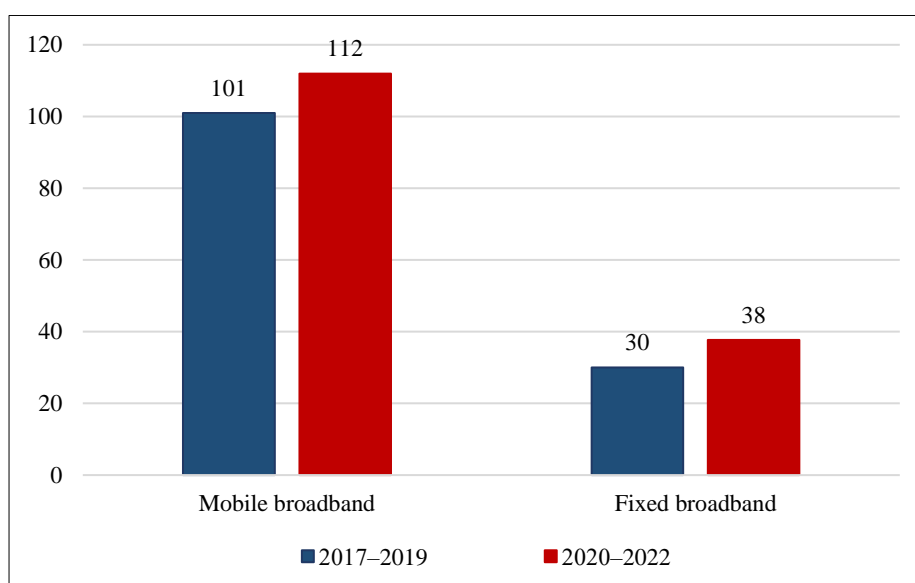
5. For instance, the average mobile broadband access rate (the number of subscriptions per 100 inhabitants) in the Asia-Pacific region increased by 14 percentage points, rising from 70 per cent during the period 2017–2019 to 84 per cent during the period 2020–2022. The fixed broadband access rate increased from 14 per cent to 17 per cent. In addition, the average bandwidth

¹ ITU, World Telecommunication/ICT Indicators Database, 27th ed. (2023). Available at www.itu.int/en/ITU-D/Statistics/Pages/publications/wtid.aspx (accessed on 11 January 2024).

usage in the region increased by 83 per cent, growing from 77 kilobits per second per Internet user during the period 2017–2019 to 141 kilobits per second per Internet user during the period 2020–2022.

6. In the East and North-East Asia subregion, access to broadband Internet (both mobile and fixed) increased during the period 2020–2022 (see figure I). The rates of both mobile (112 per cent) and fixed (38 per cent) broadband access for the period 2020–2022 were far above the respective regional averages of 84 and 17 per cent. The country with the highest mobile broadband access rate in the subregion was Japan, followed by the Republic of Korea and China.

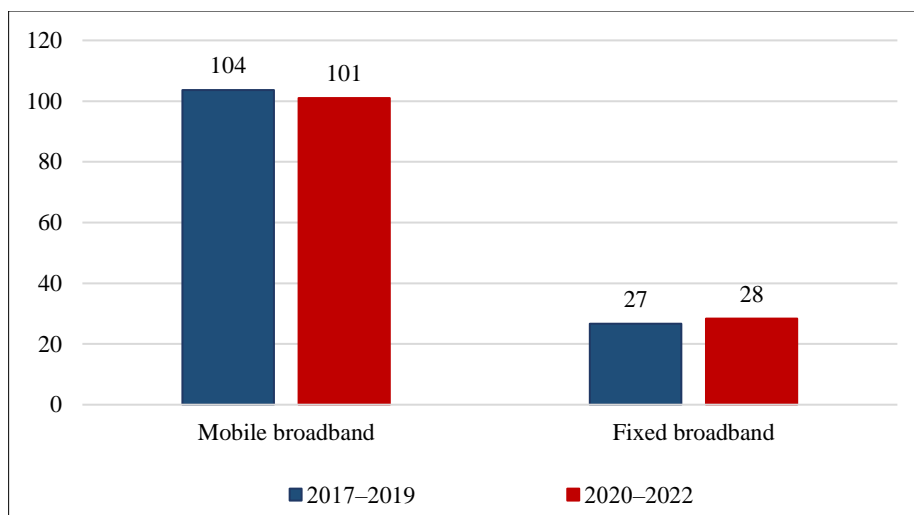
Figure I
Broadband access in East and North-East Asia before and during the COVID-19 pandemic
 (Number of broadband subscriptions per 100 inhabitants, three-year weighted average)



Source: Economic and Social Commission for Asia and the Pacific (ESCAP) calculations based on data from ITU, World Telecommunication/ICT Indicators Database, 27th ed. (2023). Available at www.itu.int/en/ITU-D/Statistics/Pages/publications/wtid.aspx (accessed on 11 January 2024).

7. In the Pacific subregion, both mobile (101 per cent) and fixed (28 per cent) broadband access rates for the period 2020–2022 were above the respective regional averages of 84 and 17 per cent (see figure II). The country with the highest mobile broadband subscription rate in the subregion was Australia, followed by New Zealand, French Polynesia, Fiji and Tonga. While the subregion’s mobile broadband subscription rate dipped during the period 2020–2022, the acquisition by an Australian telecommunications company of a company providing mobile services in Fiji, Nauru, Papua New Guinea, Samoa, Tonga and Vanuatu is expected to further expand mobile broadband services in the Pacific. In addition, the recent decision by the Government of Fiji to grant a spectrum licence to a satellite Internet provider for the provision of broadband services via low Earth orbit satellite constellations is expected to increase broadband access, especially in the country’s outer islands.

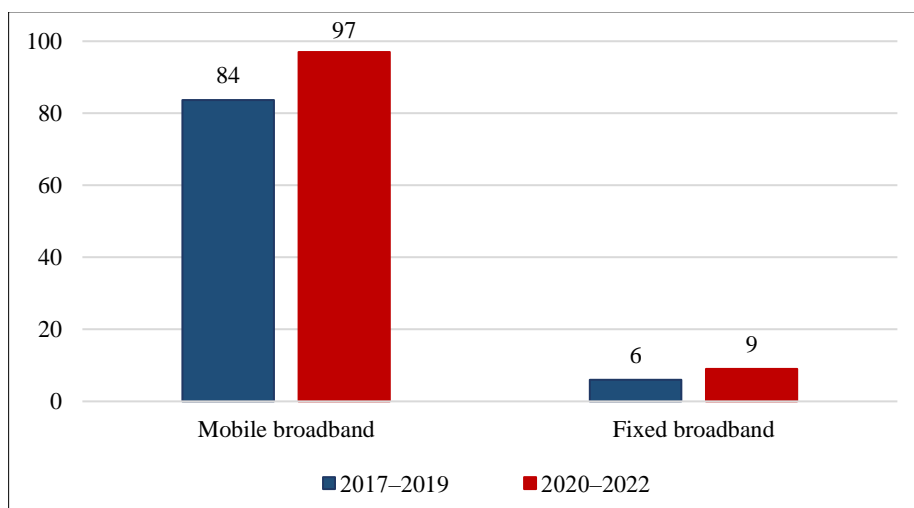
Figure II
Broadband access in the Pacific before and during the COVID-19 pandemic
 (Number of broadband subscriptions per 100 inhabitants, three-year weighted average)



Source: ESCAP calculations based on data from ITU, World Telecommunication/ICT Indicators Database, 27th ed. (see figure I).

8. In South-East Asia, rates of both mobile and fixed broadband access increased during the period 2020–2022 (see figure III). Mobile broadband subscriptions increased from 84 per cent during the period 2017–2019 to 97 per cent during the period 2020–2022. The country with the highest mobile broadband access rate in the subregion was Singapore, followed by Malaysia, Thailand, Brunei Darussalam and Cambodia. While the subregion’s 2020–2022 mobile broadband access rate of 97 per cent was well above the Asia-Pacific average of 84 per cent, its fixed broadband access rate of 9 per cent was below the regional average of 17 per cent.

Figure III
Broadband access in South-East Asia before and during the COVID-19 pandemic
 (Number of broadband subscriptions per 100 inhabitants, three-year weighted average)



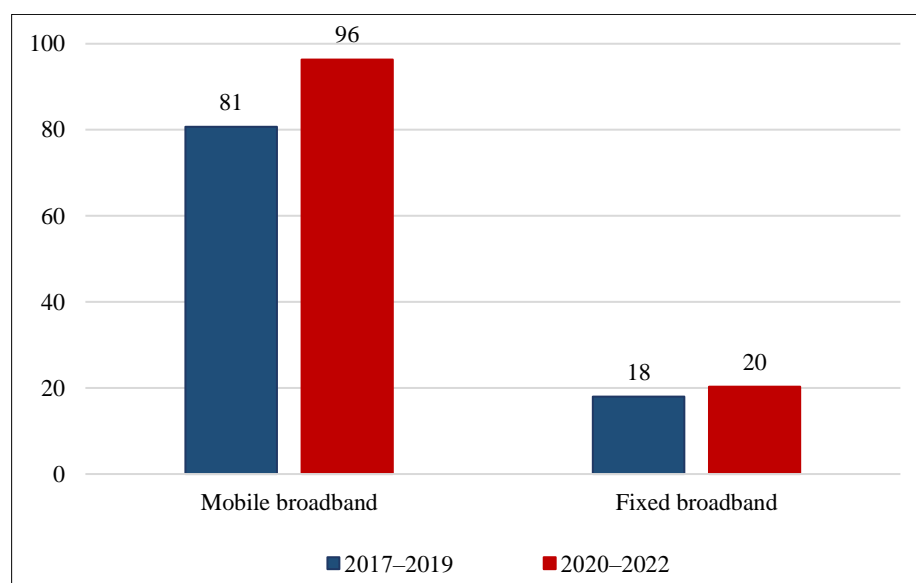
Source: ESCAP calculations based on data from ITU, World Telecommunication/ICT Indicators Database, 27th ed. (see figure I).

9. In North and Central Asia, both mobile (96 per cent) and fixed (20 per cent) broadband access rates for the period 2020–2022 were above the respective regional averages of 84 and 17 per cent (see figure IV). The country with the highest mobile broadband access rate in the subregion was Georgia, followed by the Russian Federation, Uzbekistan, Armenia and Kazakhstan. In the case of Kazakhstan, national initiatives such as the “Digital Kazakhstan” programme have accelerated the country’s digital transformation. In 2022, Kazakhstan was the only country from North and Central Asia to make the 2022 World Digital Competitiveness Ranking of the International Institute for Management Development, ranking 36th out of 63 countries. Between 2020 and 2022, Kazakhstan also moved up one spot to rank 28th in the e-government development index of the Department of Economic and Social Affairs, largely due to the significant strides it made in developing e-government services.

Figure IV

Broadband access in North and Central Asia before and during the COVID-19 pandemic

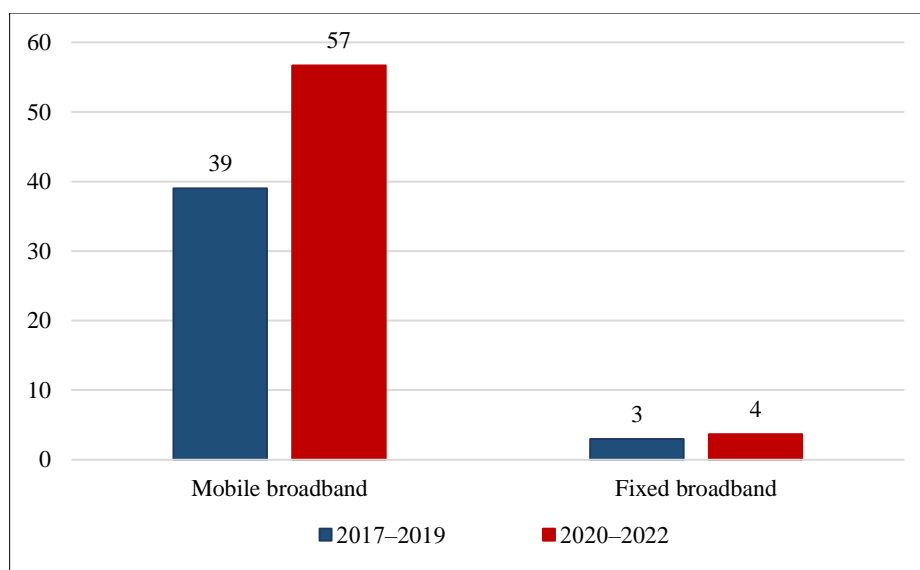
(Number of broadband subscriptions per 100 inhabitants, three-year weighted average)



Source: ESCAP calculations based on data from ITU, World Telecommunication/ICT Indicators Database, 27th ed. (see figure I).

10. In South and South-West Asia, both mobile (57 per cent) and fixed (4 per cent) broadband access rates for the period 2020–2022 increased slightly compared with the period 2017–2019 (see figure V). However, both mobile and fixed rates for the 2020–2022 period were well below the respective regional averages of 84 and 17 per cent. The country with the highest mobile broadband subscription rate in the subregion was the Islamic Republic of Iran, followed by Bhutan, Türkiye, Sri Lanka, Nepal and India.

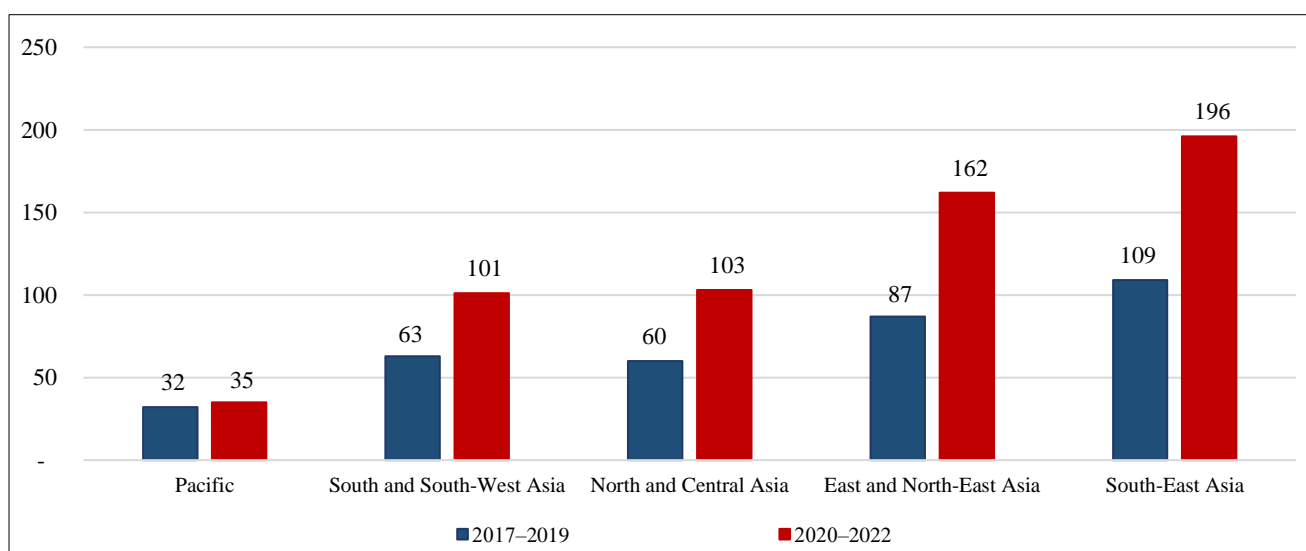
Figure V
Broadband access in South and South-West Asia before and during the COVID-19 pandemic
 (Number of broadband subscriptions per 100 inhabitants, three-year weighted average)



Source: ESCAP calculations based on data from ITU, World Telecommunication/ICT Indicators Database, 27th ed. (see figure I).

11. Bandwidth usage per Internet user increased in all subregions between the period 2017–2019 and the period 2020–2022 (see figure VI). South-East Asia stands out as the frontrunner at 196 kilobits per second per Internet user for the period 2020–2022, up from 109 kilobits per second per Internet user for the period 2017–2019. The growth was primarily propelled by the escalating demand for bandwidth during the first three years of the pandemic and a commensurate supply-side response of expanded capacity.

Figure VI
Bandwidth usage by subregion before and during the COVID-19 pandemic
 (Kilobit per second per Internet user, three-year weighted average)



Source: ESCAP calculations based on data from ITU, World Telecommunication/ICT Indicators Database, 27th ed. (see figure I).

III. Persistent digital divide

12. Despite the high rates of Internet access and usage in the Asia-Pacific region, the digital divide is a persistent problem.

13. Data on the gender digital divide show that 61 per cent of women in Asia and the Pacific use the Internet compared with 67 per cent of men.² In terms of mobile phone ownership, there is a 2 per cent gender gap in East Asia and the Pacific and a 15 per cent gap in South Asia.³ For smartphone ownership, the gender gap is 2 per cent in East Asia and the Pacific but a remarkable 42 per cent in South Asia.⁴ Internet usage is also notably higher among younger populations in the 16 members and associate members with available data.⁵

14. Data on the disability digital divide in Asia and the Pacific show that women with functional difficulties have lower median percentages of mobile (81 per cent) and Internet (35 per cent) usage than women without functional difficulties (92 per cent and 48 per cent, respectively). Similar patterns are observed among men in the four countries with available data.⁶ In addition, an urban-rural digital divide is apparent, with 82 per cent of urban residents using the Internet compared with 47 per cent of rural residents in Asia and the Pacific.⁷

15. A lack of basic digital skills and digital literacy, encompassing tasks such as using a keyboard, managing files and performing basic tasks online, is a significant barrier to Internet connectivity, in particular for groups in vulnerable situations. In eight Asia-Pacific countries with available data, the percentage of the population possessing such basic skills is below 40 per cent.⁸ Globally, women are 25 per cent less likely than men to have the knowledge to use technology for basic activities.⁹ This gender gap extends to operating a smartphone, using the Internet and engaging with social media, with women and girls being less likely to acquire these skills than men and boys are. Older individuals also face challenges, as they tend to have limited digital skills. The secretariat's "leave no one behind" analysis indicates that in most countries with data, including Afghanistan, Bangladesh, the Lao People's Democratic Republic, Pakistan, Papua New Guinea and Timor-Leste, the people furthest

² ITU, *Measuring Digital Development: Facts and Figures 2022* (Geneva, 2022).

³ For the countries included in these groups, see <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups>.

⁴ The gender gap refers to how much less likely a woman is to own a mobile phone than a man is. See Global System for Mobile Communications Association, *The Mobile Gender Gap Report 2023* (London, 2023).

⁵ *Asia-Pacific Report on Population Ageing 2022: Trends, Policies and Good Practices Regarding Older Persons and Population Ageing* (United Nations publication, 2022).

⁶ *A Three-Decade Journey towards Inclusion: Assessing the State of Disability-Inclusive Development in Asia and the Pacific* (United Nations publication, 2022).

⁷ ITU, *Measuring Digital Development*.

⁸ ESCAP/79/7.

⁹ United Nations Children's Fund (UNICEF) East Asia and Pacific Regional Office, "Girls' digital literacy in the East Asia and Pacific region: spotlight on Cambodia, Indonesia, Lao PDR, Timor-Leste and Viet Nam" (Bangkok, 2023).

behind possess hardly any basic information and communications technology skills, with Armenia, Kyrgyzstan, Tonga and Tuvalu noted as exceptions.¹⁰

16. Online violence against women, children and young people has become increasingly prevalent, with the global percentage of women who reported personally experiencing online violence or witnessing it against other women standing at 85 per cent¹¹ and over a third of young people globally reporting having experienced online bullying.¹² Concerns about the risk of sexual abuse or exploitation online are prominent among young people. In a survey of 18-year-olds covering 25 countries, 53 per cent of respondents said they strongly agree that children and adolescents are in danger of such threats. Notably, only 41 per cent of respondents in Asia said they felt confident in their ability to handle online sexual harassment.¹³ Other marginalized communities, such as older persons, persons with disabilities and migrants, also face various manifestations of online and technology-facilitated violence.

IV. Emerging good practices in digital solutions for more inclusive and sustainable government services

17. Despite the persistent challenges posed by the multidimensional digital divide, countries in Asia and the Pacific have started to implement new digital solutions for more inclusive and sustainable government services. In particular, good practices are emerging in relation to innovative digital tax solutions, effective social protection programmes and the provision of meaningful connectivity – in other words, connectivity that is seamless, reliable, accessible and affordable – for marginalized groups. The range of geospatial digital solutions for sustainable development is also rapidly expanding.

A. Innovative digital tax solutions¹⁴

18. The digitalization of tax administration contributes directly and indirectly to many targets of the 2030 Agenda for Sustainable Development. It directly supports targets such as strengthening a country's ability to collect taxes (target 17.1) and developing effective and transparent institutions (target 16.6). To make the most of digital tax solutions, countries need to invest in Internet infrastructure (target 9.c). Moreover, a strengthened ability to collect taxes can enable countries to fund public programmes that contribute to the attainment of other targets. Examples include ending poverty (target 1.a), ensuring everyone has access to good health care (target 3.8), providing quality education for all (target 4.1), giving everyone access to clean drinking water

¹⁰ ESCAP calculations based on data from the Demographic and Health Surveys and the Multiple Indicator Cluster Surveys (2016–2022); and ESCAP, *Leaving No One Behind*, online platform, available at <https://inob.unescap.org/> (accessed on 15 September 2023).

¹¹ The Economist Intelligence Unit, “Measuring the prevalence of online violence against women”, 1 March 2021.

¹² UNICEF, “UNICEF poll: more than a third of young people in 30 countries report being a victim of online bullying”, 4 September 2019.

¹³ UNICEF, “Perils and possibilities: growing up online” (New York, 2016).

¹⁴ This section draws on ESCAP, “Digitalization of tax administrations in Asia and the Pacific: progress, challenges, and opportunities”, MPFD Working Papers (forthcoming).

(target 6.1) and conserving biodiversity (target 15.a), all of which are primarily dependent on public budgets for their delivery.¹⁵

19. According to a global survey of 59 tax administrations, the COVID-19 pandemic expedited the digital transformation of tax administrations.

1. E-filing systems

20. Increasingly across Asia and the Pacific, business and personal income tax filers now submit returns electronically, and public administrations employ data analytics to help manage compliance risk.¹⁶ Errors are being reduced, and quicker tax refunds boost taxpayer trust and compliance. As the region's middle class and digitally literate population continue to grow, e-filing is expected to continue to improve tax administration.

21. In India, the income tax department introduced an e-filing system in September 2004 as a voluntary option. In July 2006, e-filing became mandatory for corporate firms, and in June 2021 the system was upgraded and a new portal was launched featuring a comprehensive dashboard for all taxpayer interactions, rapid processing of returns for expedited refunds and free income tax return preparation tools.¹⁷

22. The e-filing innovations in India offer valuable lessons for other countries. First, the technology has significantly increased tax administration efficiency, reducing processing errors and administrative costs and providing a quicker turnaround for the processing of tax returns and issuance of refunds to taxpayers. Second, the innovations fostered trust by using a user-centric design that prioritizes convenience and accessibility, thereby significantly improving the taxpayer experience. Third, while there are no data available for India, there is evidence from a number of countries, both in the region and globally, that e-filing improves tax compliance and increases tax revenues, which could be a consequence of the significantly improved taxpayer experience with such systems.

23. In a recent International Monetary Fund study, the results of a cross-country panel regression analysis suggest that the implementation of e-filing in developing countries could lead to an increase in tax revenue of as much as 3 percentage points of gross domestic product (GDP).¹⁸ In Indonesia, the percentage of taxpayers using e-filing increased from 6 per cent in 2014 to 57 per cent in 2020, and during the same period, the rate of compliance by

¹⁵ It is important to keep in view that how tax revenues are collected and spent can affect the achievement of these targets. For example, according to a World Bank policy analysis, efficient regressive taxes (such as the value added tax) when combined with generous well-targeted transfers can result in a net fiscal system that is equalizing, but the same combination of policies can increase poverty if the transfers are not large enough to compensate for the higher tax incidence on the poor. See Gabriela Inchauste and Nora Lustig, "How do taxes and transfers impact poverty and inequality in developing countries?", World Bank Blogs, 18 September 2017.

¹⁶ Organisation for Economic Co-operation and Development (OECD), "Tax administration: digital resilience in the COVID-19 environment" (Paris, 2021).

¹⁷ OECD, "India: integrated e-filing and centralized processing centre 2.0: next level digital transformation of direct tax compliance ecosystem". Available at www.oecd.org/tax/forum-on-tax-administration/database/b.4.1-india-iec-2.0.pdf (accessed on 8 December 2023).

¹⁸ David Amaglobeli and others, "Transforming public finance through GovTech", International Monetary Fund Staff Discussion Note, vol. 2023, No. 004 (Washington D.C., 2023).

individual taxpayers increased from 67 per cent to 85 per cent for employees and from 23 per cent to 52 per cent for non-employees.¹⁹ A recent study of Vietnamese enterprises similarly found that the adoption of an e-tax system has a direct and positive relationship to tax compliance.²⁰

2. E-invoicing systems

24. E-invoicing offers a more efficient and cost-effective alternative to paper invoices. It eliminates manual data entry, thereby reducing errors, and enables quicker transaction processing. E-invoicing systems not only enhance business efficiency but also provide tax authorities with real-time access to data, improving tax administration, compliance and audit data reliability. To ensure compatibility, standards have been established, such as the Pan-European Public Procurement Online standard, which has been adopted across various systems, regions and countries, including in Australia, Japan, New Zealand and Singapore.

25. In May 2018, the Infocomm Media Development Authority of Singapore became the first non-European authority to adopt the Pan-European Public Procurement Online standard, which it used to launch a nationwide e-invoicing network in January 2019. As part of this network, businesses in Singapore can transact internationally with other companies in the network.²¹

26. Although the e-invoicing system in Singapore was set up with the objective of improving business efficiency, the country's tax administration recently announced a plan to upgrade the system to also support the administration of the goods and services tax.²² In contrast to Singapore, the Governments of other countries in the region, such as the Republic of Korea and Uzbekistan, have implemented e-invoicing systems as a tax compliance tool, using a continuous transaction control platform to allow the tax authority to collect real-time or near real-time e-invoice data.

3. E-withholding tax systems

27. An e-withholding tax system is used to digitally synchronize tax withholding and payment processes to streamline tax collection between employers and employees and ensure compliance with tax regulations. The main characteristic of an e-withholding tax system is the electronic recording and reporting of tax withholdings, using digital tools such as online portals and software applications, to capture and store information related to employee salaries, tax deductions and remittances and to automate calculations, thereby reducing errors and improving transparency.

¹⁹ Nurul Izzah Lubis, Tengku Eka Susilawaty and Benny Lyanto, "The growth and impact of e-filing in Indonesia", *Accumulated Journal*, vol. 4, No. 2 (July 2022), pp. 186–198.

²⁰ Ha Thi Hai Do and others, "The impact of attitude towards an e-tax system on tax compliance of Vietnamese enterprises: adoption of an e-tax system as a mediator", *Journal of Entrepreneurship, Management and Innovation*, vol. 18, No. 1 (2022), pp. 35–64.

²¹ Infocomm Media Development Authority, "About the nationwide e-invoicing initiative", 3 August 2023.

²² Singapore, Inland Revenue Authority of Singapore, "New digital solution ideas, deepening partnerships at the 16th Forum on Tax Administration Plenary 2023", media release, 11 October 2023.

28. In 2018, the Australian taxation authority implemented an e-withholding tax system with a view to optimizing revenue collection in the context of an increasingly globalized economy, the proliferation of digital transactions and the expansion of the gig economy. The system requires employers to electronically report real-time payroll information to the taxation authority. In 2022, a second phase of the project was launched, with the aim of reducing the burden on employers to report employee information to multiple government agencies.²³

4. Point-of-sale systems

29. A point-of-sale system is used to digitally automate and streamline the tax collection process at the point of sale. Modern point-of-sale systems integrate with tax tools, giving tax authorities access to real-time transactional data.

30. In the Republic of Korea, a point-of-sale tax system was introduced as part of a broader process to digitalize tax administration, which started in 1997 with the launch of an integrated tax system that connects all district tax offices to a single network.²⁴ In 2005, the country's national tax service implemented a point-of-sale system to curb tax evasion associated with cash transactions, which at the time accounted for about 61 per cent of total private consumption.²⁵

31. The implementation of the system resulted in a drastic increase in the number of cash receipts issued, reaching a value of approximately \$97 billion by 2018, or about 6.3 times higher than in 2005. The system has been seen as a success in curbing tax evasion by cash-based companies in the retail sector, although it may have led to price increases and caused some firms to exit the retail market.²⁶

5. Track and trace systems

32. Track and trace systems use unique product identifiers to ensure the real-time monitoring and verification of products as they move through supply chains, from manufacturer to end consumer. The data that is captured provides a transparent view of product movements, ensuring accurate taxation at each stage and deterring illicit trade practices.

33. The Government of Pakistan began rolling out a track and trace system in 2021 with the aim of enhancing tax revenue, reducing counterfeiting and preventing the smuggling of illicit goods. The Federal Board of Revenue initially introduced the system in three sectors – sugar, tobacco and fertilizers – followed by the cement industry in August 2023. By digitally monitoring

²³ Australia, Australian Taxation Office, “Expanding Single Touch Payroll Phase 2”, 21 December 2022.

²⁴ Daeyong Kim, “Digital transformation of tax administration in the Republic of Korea: lessons from experience and ways forward”, The Governance Brief, No. 52 (Manila, Asian Development Bank, 2023).

²⁵ Jae-Jin Kim, “Digitalization of the tax administration and its achievements in the Republic of Korea”, in *Taxation in the Digital Economy*, Nella Hendriyetty and others, eds. (London, Routledge, 2022).

²⁶ Namryoung Lee and Charles Swenson, “The Korean approach to solving tax evasion”, *Proceedings of ISERD International Conference* (Phnom Penh, International Society for Engineering Research and Development, 2017). Available at www.worldresearchlibrary.org/up_proc/pdf/653-14876711627-11.pdf.

production volumes, the system has increased transparency in production data, thus reducing tax evasion through underreporting. The system has also made it more difficult for counterfeiters to produce and distribute counterfeit goods, protecting consumers from potentially harmful products and legitimate businesses from unfair competition.²⁷

B. Social protection and meaningful connectivity for marginalized groups

34. To harness the full potential of digital innovation for inclusive development, meeting the diverse needs of marginalized groups is essential. It is crucial to take a whole-of-government and whole-of-society approach and ensure that marginalized communities actively participate in and contribute to the digital transformation process. Various innovative initiatives have been undertaken in the region to accelerate progress towards the universal provision of meaningful connectivity.

1. Ensuring meaningful connectivity

35. In China, the digital divide between old and young people narrowed after the onset of the COVID-19 pandemic, with the number of Internet users aged 60 years and older almost doubling from 60.5 million in March 2020 to 110.8 million in December 2020. The increase can largely be attributed to an increase in online shopping, the utilization of public health applications and searches for information about COVID-19 during lockdowns. Notably, many older Chinese citizens acquired Internet access and the necessary Internet navigation skills thanks to assistance provided by their children, relatives and community volunteers.²⁸

36. The Russian Federation has a high Internet usage rate (90.4 per cent of the total population), with almost full gender parity (90.0 per cent for women and 90.4 per cent for men).²⁹ Several government initiatives have contributed to a significant narrowing of the gender digital divide, including a national strategy that involves providing new opportunities for women in the labour market, increasing women's participation in entrepreneurship and improving the quality of education, advanced training and professional retraining.³⁰

37. In Vanuatu, the Government collaborated with ITU to launch a pilot initiative in the southern region of Malekula to facilitate digital transformation at the grass-roots level. Very small aperture terminal infrastructure has been installed to connect villagers to the Internet. In addition, digital literacy training has been provided to residents, including young people, women, persons with disabilities and older persons, helping to transform remote villages and islands into digitally enabled communities.³¹

²⁷ Pakistan, Federal Board of Revenue, "Track and trace system". Available at www.fbr.gov.pk/introduction-track-and-trace/152962/152963 (accessed on 8 December 2023).

²⁸ Yao Yao and others, "Bridging the digital divide between old and young people in China: challenges and opportunities", *The Lancet*, vol. 2, No. 3 (March 2021).

²⁹ ITU, World Telecommunication/ICT Indicators Database, 27th ed. (2023).

³⁰ Svetlana Kuzmina and others, "Russian trends in ensuring gender equality in the digital economy", *BIO Web of Conferences*, vol. 84 (January 2024).

³¹ Saemi Matsumoto and Dalsie Tolang, "Transforming a small island into a smart island: Southern Malekula, Vanuatu", ITU, 20 February 2023.

2. Strengthening the digital skills of marginalized groups

38. Equipping workers, particularly those from marginalized communities, with digital skills is crucial. In the Asia-Pacific region, people who use advanced digital skills at work, such as software developers and cloud architects, earn 65 per cent more than their counterparts who have similar levels of education and experience but do not use digital skills. People who use basic digital tools at work, such as email and word processing software, earn 39 per cent more.³² Advanced digital skills also give workers significant bargaining power for flexibility and training opportunities.

39. Dedicated programmes for upskilling and reskilling the workforce in the digital age have been implemented in a number of countries. In Singapore, for example, the Government introduced a digital workplace initiative that is focused on automation, cybersecurity risk, data analytics and in-demand digital tools.³³

3. Building an enabling ecosystem for the digital inclusion of marginalized groups

40. Digital technology and innovation can have a transformative impact when used as part of an ecosystem approach that encompasses, for example, public employment services, digital labour platforms and social protection systems.

41. Public employment services can enhance their efficiency by leveraging digital technology to connect information systems, provide job search monitoring tools and automate administrative processes. Such digitalization initiatives allow staff to focus on meeting the diverse needs of the people they serve, including people from marginalized communities.

42. In the Republic of Korea, the public employment service is harnessing big data to offer personalized support for jobseekers, including those in vulnerable situations. An artificial intelligence-based system has been created, using algorithms and psychological testing to analyse jobseekers' data and provide customized job recommendations. It also offers personalized advice on training, qualifications and vocational guidance.³⁴ The initiative demonstrates the potential of big data to cater to the diverse needs of individuals seeking employment, especially those in vulnerable situations.

43. Digital labour platforms offer income-generating opportunities with flexibility regarding working location and hours of work, benefiting marginalized groups such as women with care responsibilities, young people, migrants and persons with disabilities. Such platforms also provide workers with a way to supplement income from low-paying and seasonal jobs.³⁵ In Malaysia, an app-based ride-hailing and food delivery company introduced an initiative to hire persons with disabilities as drivers and delivery partners, enabling over 500 hearing-impaired drivers to earn income through the

³² Gallup, "AWS Asia Pacific digital skills study: the economic benefits of a tech-savvy workforce" (Washington, D.C., 2023).

³³ See www.skillsfuture.gov.sg.

³⁴ International Labour Organization (ILO), *Public Employment Services and Active Labour Market Policies for Transitions: Global Report Part I – Response to Mega Trends and Crises* (Geneva, 2023).

³⁵ ILO, *World Employment and Social Outlook 2021: The Role of Digital Labour Platforms in Transforming the World of Work* (Geneva, 2021).

application. The company also appointed 19 persons with disabilities to its driver representative committee. Following the success of the initiative, the company launched another project in 2023 to empower persons with disabilities and marginalized communities and provide them with equal access to opportunities as drivers, delivery partners and merchant partners.³⁶

44. Governments are increasingly acknowledging the importance of social protection in fostering a productive, secure and healthy population. The adoption of digital technology and innovation for social protection can yield benefits for both public administration and beneficiaries. For public administrations, benefits include decreased administrative costs and improved data quality, transparency, service delivery and monitoring. As for beneficiaries, they gain increased awareness of and access to various schemes and spend less time travelling to physical service locations, which also reduces the risk of harassment or violence during travel, especially for women.

45. Furthermore, digital payments are a way for Governments to take anticipatory action to enhance the resilience of groups vulnerable to climate change-related shocks. For example, in 2020, the Government of Bangladesh provided digital payments to individuals in need ahead of the annual flooding season in order to strengthen their food security and mitigate risks.³⁷

4. Addressing online and technology-facilitated violence against marginal groups

46. While digital spaces provide avenues for connectivity and information-sharing, they also pose significant challenges with the rise of online and technology-facilitated violence. Marginalized communities are disproportionately affected, experiencing various forms of violence, such as harassment and cyberstalking.

47. In the Philippines, efforts to combat technology-facilitated child sexual exploitation and abuse are coordinated by an inter-agency council against child pornography that oversees the implementation of relevant legislation and a national response plan in collaboration with specialized units in law enforcement agencies. In addition, a centre dedicated to investigating computer crimes against children was formed in 2019. Other public sector interventions include the piloting of child-sensitive court procedures, the introduction of a multidisciplinary curriculum for family court judges and personnel and the development of survivor compensation guidelines. In the private sector, a consortium was established in 2019, bringing together businesses, telecommunication companies and other organizations to create a safe online environment for children.³⁸

³⁶ *Disability at a Glance 2021: The Shaping of Disability-Inclusive Employment in Asia and the Pacific* (United Nations publication, 2021); and Grab, “Grab announces GrabAccess reiterating their commitment to create inclusive opportunities for PWD on the Grab platform”, 9 January 2023.

³⁷ Food and Agriculture Organization of the United Nations and International Policy Centre for Inclusive Growth, *Digital Innovations in Delivering Social Protection in Rural Areas: Lessons for Public Provisioning during the Post-Pandemic Recovery and Beyond* (Rome and Brasilia, 2022); and Anir Chowdhury and others, “Accelerating digital cash transfers to the world’s poorest”, The Brookings Institution, 17 February 2022.

³⁸ UNICEF, *Ending Online Child Sexual Exploitation and Abuse: Lessons Learned and Promising Practices in Low- and Middle-Income Countries* (New York, 2021).

C. Geospatial solutions for sustainable development

48. It has been shown that climate-induced disasters slow down progress towards achieving the Sustainable Development Goals, with least developed countries disproportionately affected, and that multi-hazard early warning systems could reduce disaster losses by up to 60 per cent.³⁹ Under the Asia-Pacific Plan of Action on Space Applications for Sustainable Development (2018–2030), research, capacity-building and regional knowledge-sharing initiatives are being undertaken to demonstrate how new digital technologies, in tandem with big Earth data, could enhance early warning systems in the region.

49. In collaboration with its partners, the secretariat has launched tools to demonstrate the operational applications of using large language models in geospatial data analysis and Earth observation for flood risk hotspot mapping. A prototype flood risk mapping tool has been developed and customized for four countries in the region: India, Kiribati, Pakistan and Thailand. It applies a water classification algorithm to analyse historical satellite imagery and provide decision makers with information about the physical characteristics of floods and their socioeconomic impacts.

50. The aim of using large language models for real-time data interpretation is to strengthen the analytical capabilities of users and improve the timeliness and accuracy of early warning systems. These tools are expected to facilitate quicker and evidence-based decision-making to enhance disaster preparedness and response and, in the long term, to help build resilience to climate-induced hazards.

51. Satellite remote sensing can also serve as an important data source for monitoring air pollution, which is one of the most pressing environmental health problems globally, in particular in Asian countries. According to data for the period 2017–2021, the two highest concentrations of particulate matter were observed in the South-East Asia and Western Pacific regions (as defined by the World Health Organization), where concentrations of up to 4.8 times those in other regions were recorded.⁴⁰

52. In cooperation with its partners, the secretariat is working to enhance the capacity of member States to utilize data from the Geostationary Environment Monitoring Spectrometer of the Republic of Korea, which are integrated with surface-based data from instruments such as the Pandora Spectrometer System, for air pollution monitoring and management. In 2023, technical missions and online training activities were conducted to highlight state-of-the-art research outputs and methodologies that can be used to improve the understanding of variability in atmospheric composition for evidence-based policymaking.

V. Policy recommendations

53. The discussion above provides evidence of how digital connectivity and an expanding array of innovative digital applications, spurred on by the

³⁹ *Asia-Pacific Disaster Report 2023: Seizing the Moment – Targeting Transformative Disaster Risk Resilience* (United Nations publication, 2023).

⁴⁰ ESCAP analysis based on data from World Health Organization, WHO Ambient Air Quality Database (updated 2023). Available at [www.who.int/publications/m/item/who-ambient-air-quality-database-\(update-2023\)](http://www.who.int/publications/m/item/who-ambient-air-quality-database-(update-2023)) (accessed on 29 December 2023).

COVID-19 pandemic, are accelerating the transition to more inclusive societies and contributing towards sustainable development. Notwithstanding these positive developments, significant implementation challenges remain, and policy reforms and enhanced regional cooperation are required to address them. In recognition of the strategic contribution of digital technologies, in its resolution 79/10, the Commission decided to convene the first Asia-Pacific Ministerial Conference on Digital Inclusion and Transformation, to be held in Astana in September 2024. A ministerial declaration is expected to be adopted, centred around key policy recommendations for the accelerated delivery of the Action Plan for Implementing the Asia-Pacific Information Superhighway Initiative, 2022–2026, some of which are outlined below.

A. Digital connectivity

54. The digital divide continues to widen in the Asia-Pacific region. On the supply side, accelerated investment in international digital connectivity through undersea fibre-optic cables and terrestrial cross-border links creates opportunities for regional cooperation and integration. Improved digital connectivity fosters economic collaboration and facilitates the flow of information across borders.

55. On the demand side, enhancing digital skills and awareness through formal and informal education systems can address barriers to access, affordability and digital literacy. The aim of such capacity-building initiatives is to ensure that all segments of society have the skills and means to benefit from information and communications technology infrastructure. In addition, widespread connectivity can be a catalyst for economic growth and the implementation of the Sustainable Development Goals. It enables the digitalization of industries, fostering innovation, increasing productivity and creating new opportunities for businesses, in particular small and medium-sized enterprises.

B. Innovative digital tax solutions

56. Governments looking to reap the benefits of implementing or scaling up the digital tax solutions discussed above face many challenges. Two such challenges that should be considered top priorities for tax administrations to address are insufficient digital literacy of staff and managers and vulnerability to cybersecurity threats. To bridge the digital literacy gap, training programmes can be designed to cover a broad spectrum of digital skills, including advanced topics such as data analysis and cybersecurity. Contributions can also be sought from educational institutions and technology firms to enhance the quality and relevance of training.

57. Given the large amount of confidential information handled by tax administrations, it is critical that it be protected from cybersecurity risks. While most if not all countries have made it a top policy priority to develop a robust and comprehensive data security and privacy framework to protect taxpayer information, implementation needs to be accelerated. Such a framework should cover both the physical protection of servers, workstations and networks and the establishment of clear guidelines for staff and managers regarding data privacy and security. It is also fundamental to invest in training and awareness campaigns that clearly communicate the importance of data security and privacy and the government actions that need to be taken to ensure their protection.

58. A specific challenge in many developing countries is the pervasiveness of the informal economy. Informal workers and businesses usually do not have access to conventional financial services, social security or the protection of the judicial system. Formalization, which involves registering individuals and businesses as taxpayers, is beneficial for many reasons, including: reducing vulnerabilities; increasing tax revenues, for potentially significant amounts given the large share of GDP that the informal economy accounts for; and incentivizing tax compliance by larger firms, which often complain about unfair competition from untaxed businesses. From a governance perspective, taxing firms in the informal economy may be a way to engage them with the State, thus promoting legitimacy, good governance and political accountability.

59. Policies to encourage the voluntary formalization of informal businesses include introducing simplified business registration processes and setting up dedicated departments in tax administrations to deal with small businesses, including those in the informal sector. Voluntary registration and tax compliance may be further incentivized by earmarking the associated tax revenues and linking them to local-level public expenditure for the delivery of targeted benefits.

60. Other challenges include the high costs associated with technology procurement, system integration, training and maintenance and cultural resistance to the transition away from a familiar, traditional method to a new digital platform. To ease the financial burden, Governments can consider offering tax deductions or tax credits to defray a portion of the costs. To ease the transition from paper-based methods, it is important to design user-friendly and effective platforms and systems, for which it is advisable to engage the collaboration of key stakeholders, including end users and software companies.

C. Social protection and meaningful connectivity for marginalized groups

61. Efforts to bridge digital divides must address key aspects of meaningful connectivity, including technological availability, affordability, accessibility, usability and quality.

62. Creating enabling ecosystems is essential for the effective integration of marginalized groups into digitalized societies. A comprehensive, human rights-based approach is crucial to combat online violence against individuals in vulnerable situations, safeguarding rights such as freedom of expression, privacy and data protection.

63. To advance the digital inclusion of marginalized groups, continuous measurement and monitoring are imperative. Governments need to invest in systematically collecting and analysing data on digital development, taking into consideration factors such as gender, age, disability, location, ethnicity, migration status, education and socioeconomic status. It is also crucial to foster collaboration among government entities, civil society organizations, private sector companies, academic institutions and development partners. Co-designing policies with people in vulnerable situations provides deeper insights into their specific needs.

D. Geospatial solutions for sustainable development

64. As the examples above illustrate, digital technologies are transforming the applications of geospatial information for sustainable development by

making them more available, accessible, affordable and actionable. The geospatial good practices database and dashboard, which is available on the website of the Commission, provides examples of geospatial information applications and digital innovations that are already operational throughout Asia and the Pacific to help implement the Sustainable Development Goals. Transforming these applications into solutions, and ultimately into tangible impacts, requires policy action and investment in capacity-building for both users and producers of geospatial information.

65. First, countries need access to a diverse range of digital technologies, which increasingly involve artificial intelligence, cloud computing and big Earth data, to fully leverage the potential of geospatial data to create sustainable development solutions. Second, the capacity to develop effective and relevant geospatial solutions using digital technologies needs to be built. Third, more engagement of end users will ensure more user responsiveness across various sectors.⁴¹ The initiatives being undertaken by member States in implementing the Asia-Pacific Plan of Action on Space Applications for Sustainable Development (2018–2030) are important steps towards addressing these access and capacity gaps. Still, some countries need accelerated support to implement the Plan of Action, which is now in its phase II (2022–2026).

VI. Issues for consideration by the Commission

66. The Commission may wish to take note of the present document and provide the secretariat with further guidance.

67. The Commission may also wish to:

(a) Encourage members and associate members to share national policy perspectives and experiences on digital innovations and solutions for achieving the Sustainable Development Goals through the use of regional platforms, such as the Asia-Pacific Information Superhighway initiative, and through the implementation of the Action Plan for Implementing the Asia-Pacific Information Superhighway Initiative, 2022–2026;

(b) Invite the secretariat to continue supporting members and associate members by facilitating capacity-building activities on digital inclusion and transformation, including on the use of geospatial data for sustainable development, by supporting evidence-based analytical research, knowledge-sharing and policy development, and by facilitating multi-stakeholder policy dialogues on the issues discussed in the present document;

(c) Request the secretariat to promote the active engagement and collaboration of all relevant stakeholders in the Asia-Pacific Ministerial Conference on Digital Inclusion and Transformation, to be held in Astana in September 2024;

(d) Encourage members and associate members to continue their active involvement in the implementation of the Asia-Pacific Plan of Action on Space Applications for Sustainable Development (2018–2030) in its phase II (2022–2026).

⁴¹ *Geospatial Practices for Sustainable Development in South-East Asia 2022: A Compendium* (United Nations publication, 2023).