

**Economic and Social Commission for Asia and the Pacific**Committee on Information and Communications Technology,  
Science, Technology and Innovation**Third session**

Bangkok, 19 and 20 August 2020

Item 3 of the provisional agenda\*

**Bridging the digital divide for inclusive broadband access****Promoting regional cooperation for inclusive broadband connectivity through the Asia-Pacific Information Superhighway initiative****Note by the secretariat***Summary*

In its resolution 75/7, the Economic and Social Commission for Asia and the Pacific invited members and associate members to consider developing subregional implementation plans for inclusive broadband connectivity through the Asia-Pacific Information Superhighway initiative. It also requested the Executive Secretary to support member countries with policy advice, technical studies and capacity-building and encouraged the participation of various stakeholders to that end. It further requested the Executive Secretary to report to the Committee on Information and Communications Technology, Science, Technology and Innovation, at its third session, on progress made with regard to subregional implementation plans for the Asia-Pacific Information Superhighway initiative. The present document has been prepared in response to that request.

Accordingly, it contains a review of emerging trends related to digital technologies and regional connectivity and an outline of progress in subregional implementation of the Asia-Pacific Information Superhighway initiative. In addition, the document serves to highlight capacity-building activities conducted by the Asian and Pacific Training Centre for Information and Communication Technology for Development to facilitate the use of information and communications technology for inclusive and sustainable development.

The Committee may wish to note the progress made in the implementation of the Asia-Pacific Information Superhighway initiative and the programmes and activities of the Asian and Pacific Training Centre and to provide further guidance on the future direction of work, with a focus on preparing the master plan for the Asia-Pacific information superhighway, 2023–2026, and the Asia-Pacific information superhighway regional cooperation framework document 2023–2026.

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\* ESCAP/CICTSTI/2020/L.1.

## I. Introduction

1. As the decade of action for the Sustainable Development Goals began in 2020, it was clear that on its current trajectory, the Asia-Pacific region would not achieve any of the 17 Goals by 2030. The largest regression has been on Goal 12 (Responsible consumption and production).

2. By April 2020, as the coronavirus disease (COVID-19) lockdowns made virtual reality a much larger part of people's lives almost overnight, digital connectivity had taken on a compelling new meaning in the region (see ESCAP/CICTSTI/2020/1). As the decade of action proceeds, it appears that the developmental context is changing significantly. The digital reality of life under the COVID-19 lockdowns is providing a once-in-a-lifetime opportunity to rethink material-intensive consumption and production patterns and transition to a more decarbonized and sustainable economic model. However, this will only be possible with continuous universal access to affordable and reliable broadband Internet.

3. The present document contains a review of emerging trends related to digital technologies and regional connectivity and an outline of the progress in the implementation of Asia-Pacific Information Superhighway initiative at the subregional level. It also serves to highlight capacity-building activities conducted by the Asian and Pacific Training Centre for Information and Communication Technology for Development to facilitate the use of information and communications technology (ICT) for inclusive and sustainable development.

## II. Emerging trends in digital technologies and regional connectivity

4. Approximately half of the population in Asia and the Pacific has no access to the Internet. While broadband access, affordability and quality have improved over time, regional progress has been uneven, with lower-income and geographically remote countries remaining the most disconnected and benefiting the least from dynamic growth in the sector. The nature of the digital divide in the region is examined below.

### A. Broadband access

5. Broadband connectivity in Asia and the Pacific continues to increase, both directly and indirectly providing transformative opportunities for sustainable development to benefit billions of people in the region. On average, approximately 140 million people in the region are coming online every year, representing an average annual growth rate of 13 per cent over the course of the 2010s.<sup>1</sup> This growth is primarily due to the rapid growth of mobile infrastructure and services, with an estimated 71 per cent of the regional population now able to access a mobile network.

6. Consequently, in recent years, the region has also experienced a deceleration in the growth of broadband connectivity. The average growth rate of mobile subscriptions for the period from 2014 to 2018 was reduced by half as compared to the period from 2009 to 2013. Concurrently, growth in fixed-

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<sup>1</sup> Economic and Social Commission for Asia and the Pacific (ESCAP) calculations based on the International Telecommunication Union (ITU), *World Telecommunication/ICT Indicators Database*, 23rd ed (2019). Available at [www.itu.int/en/ITU-D/Statistics/Pages/publications/wtid.aspx](http://www.itu.int/en/ITU-D/Statistics/Pages/publications/wtid.aspx) (accessed on 21 January 2020).

broadband subscriptions has remained sluggish for the past decade, with fixed broadband accounting for fewer than 15 subscriptions per 100 inhabitants.

7. At the subregional level, the growth in mobile-broadband subscriptions is predominantly driven by East and North-East Asia, followed by North and Central Asia and South-East Asia (see figure I). South and South-West Asia and the Pacific small island developing States remain the least-connected subregions, despite high growth in past years. For fixed-broadband subscription growth, the subregional divergence is more pronounced. East and North-East Asia and North and Central Asia performed relatively well in terms of growth in fixed-broadband subscriptions. South-East Asia, South and South-West Asia and the Pacific small island developing States have registered much slower progress.

8. When the data are disaggregated by income level and development status, the widening of the broadband divide is even more evident. Once again, particularly in fixed-broadband subscriptions, low- and lower-middle-income countries in the region have lagged behind, with some countries recording almost no improvement over the past decade (see figure I). Despite significant improvements in deploying third-generation (3G) and fourth-generation (4G) wireless system networks, 20 per cent of the population in low-income countries is still not covered by 3G networks, while 4G networks reach only half of the population.

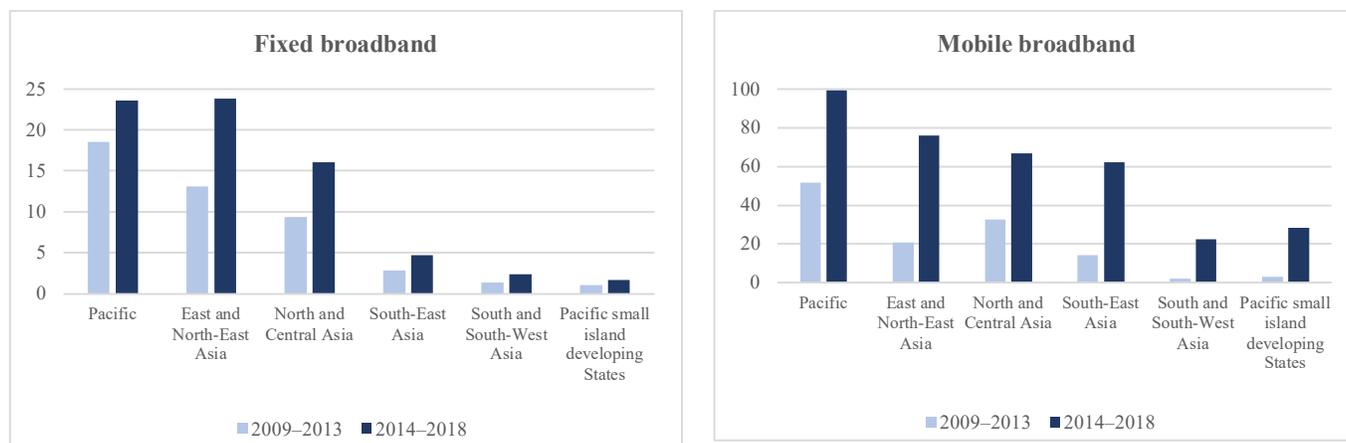
9. In addition, the digital divide between urban and rural areas remains and is particularly stark in low-income countries. For instance, in 2016, 88 per cent of the urban population in Japan was connected to the Internet, whereas 83 per cent of the rural population had access to the Internet. In contrast, only 29 per cent of the rural households in Bhutan had access to the Internet, while more than 70 per cent of urban households had access. In Samoa, 11 per cent of urban households had access to the Internet in 2016, compared to 2 per cent of rural households.<sup>2</sup>

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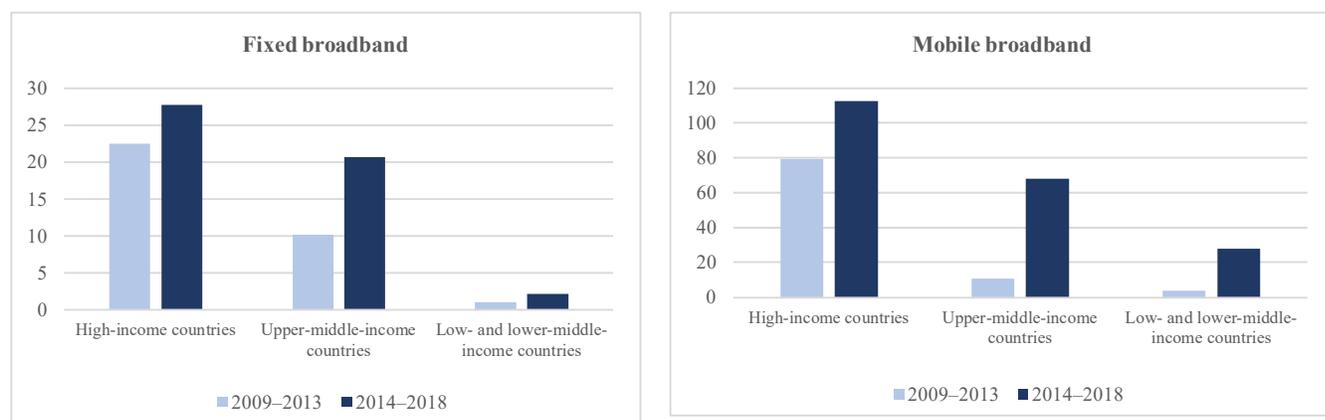
<sup>2</sup> ITU, *World Telecommunication/ICT Indicators Database*.

Figure I  
**Fixed- and mobile-broadband subscriptions per 100 inhabitants, five-year average**

*Classified by subregion*



*Classified by income*



*Source:* Economic and Social Commission for Asia and the Pacific (ESCAP) calculations based on the International Telecommunication Union (ITU), *World Telecommunication/ICT Indicators Database*, 23rd ed (2019). Available at [www.itu.int/en/ITU-D/Statistics/Pages/publications/wtid.aspx](http://www.itu.int/en/ITU-D/Statistics/Pages/publications/wtid.aspx) (accessed on 21 January 2020).

10. The gender digital divide represents yet another challenge. In Asia-Pacific countries, women are less likely to be digitally connected than men, and the divide is particularly prevalent in South Asia.<sup>3</sup> For example, in Pakistan, the rate of mobile phone ownership among men was twice the rate among women, and the gender gap in ownership of mobile phones with Internet connectivity was even greater.<sup>4</sup> Similarly, in India, there were twice as many men among Internet users as there

<sup>3</sup> Ibid.

<sup>4</sup> Pathways for Prosperity Commission on Technology and Inclusive Development, Blavatnik School of Government, Oxford University, *Digital Lives: Meaningful Connections for the Next 3 Billion* (n.p., 2018).

were women.<sup>5</sup> Looking beyond access to examine actual usage diversity and intensity among mobile Internet users, a consumer survey conducted in 2018 confirmed the existence of a gender gap there as well, showing that women were substantially more likely than men to use a more limited range of mobile-based service types, and that among weekly users of such services, women used them less than men. Other socioeconomic factors such as low literacy rates and poor economic opportunities for women can further exacerbate the gender divide and intensify women's risk of being left behind as societies and economies go digital.<sup>6</sup>

## B. Broadband affordability

11. Access is a necessary but insufficient step in narrowing the digital divide. Affordability is key to extending broadband to the 52 per cent of the region's population that remains offline. Overall, prices are still relatively high and considered unaffordable, especially with regard to fixed-broadband subscriptions. According to ITU data, in 2017, at least 29 ESCAP member States had fixed-broadband subscription prices above the affordability threshold of 2 per cent of per capita gross national income established by the Broadband Commission for Sustainable Development, and most of the 29 were low- or lower-middle-income countries. In addition, although mobile broadband prices have become more accessible, they remain above the affordability threshold in low- and lower-middle-income countries (see table 1).

Table 1

### Prices of fixed and mobile broadband by level of income, three-year average

	<i>Fixed-broadband (wired) subscription charge</i>			<i>Price of handset-based mobile prepaid broadband plan</i>			<i>Price of universal serial bus (USB)/dongle-based mobile post-paid broadband plan</i>		
	<i>Percentage of monthly per capita gross national income</i>		<i>Percentage change</i>	<i>Percentage of monthly per capita gross national income</i>		<i>Percentage change</i>	<i>Percentage of monthly per capita gross national income</i>		<i>Percentage change</i>
	<i>2012–2014</i>	<i>2015–2017</i>		<i>2012–2014</i>	<i>2015–2017</i>		<i>2012–2014</i>	<i>2015–2017</i>	
Asia-Pacific	5.4	4.2	-22.3	1.7	1.4	-13.9	8.9	2.5	-72.4
High-income countries	0.8	0.8	5.5	0.7	0.7	5.9	1.1	0.9	-17.6
Upper-middle-income countries	3.5	2.3	-33.5	0.9	0.7	-29.7	12.8	1.1	-91.3
Low- and lower-middle-income countries	7.5	6.1	-19.3	2.1	2.1	0.4	7.5	3.7	-51.0

Source: ESCAP calculations based on ITU, *World Telecommunication/ICT Indicators Database* (see figure I).

<sup>5</sup> Internet and Mobile Association of India and Nielsen Company, "India Internet 2019". Available at <https://cms.iamai.in/Content/ResearchPapers/d3654bcc-002f-4fc7-ab39-e1fbeb00005d.pdf> (accessed on 25 February 2020).

<sup>6</sup> Oliver Rowntree, *GSMA Connected Women: The Mobile Gender Gap Report 2019* (London, GSM Association, 2019).

12. Furthermore, even though broadband prices are on the decline throughout the region, table 1 shows greater declines in higher income groups. For example, in a comparison of average prices for the periods 2012–2014 and 2015–2017, the greatest decline in fixed-broadband subscription prices as a percentage of monthly per capita gross national income, at 33.5 per cent, occurred in upper-middle-income countries, compared to a decline of less than 20 per cent in low- and lower-middle-income countries. Similarly, the price of a handset-based mobile prepaid broadband plan in the upper-middle-income countries fell by 30 per cent but remained largely unchanged in low- and lower-middle-income countries.

### C. Broadband quality

13. Quality, specifically in terms of speed and latency, is another important dimension of capturing the power of broadband connectivity, as many people have experienced during the COVID-19 lockdowns. The digital divide in broadband quality is consistent with the divide in access and affordability, with the region's low- and lower-middle-income countries facing far greater challenges in providing quality broadband services than countries in other income groups. The problem is two dimensional. First, regardless of income group, average upload and download speeds and latency for mobile broadband are only half as good as fixed broadband. Consequently, lower-income countries, where little to no progress has been made in deploying fixed-line connectivity, continue to experience significant quality problems. Second, fixed broadband is three- to five-times faster in high-income countries than in low- and lower-middle-income countries, while mobile broadband is approximately three-times faster in high-income countries than in low- and lower-middle-income countries.<sup>7</sup>

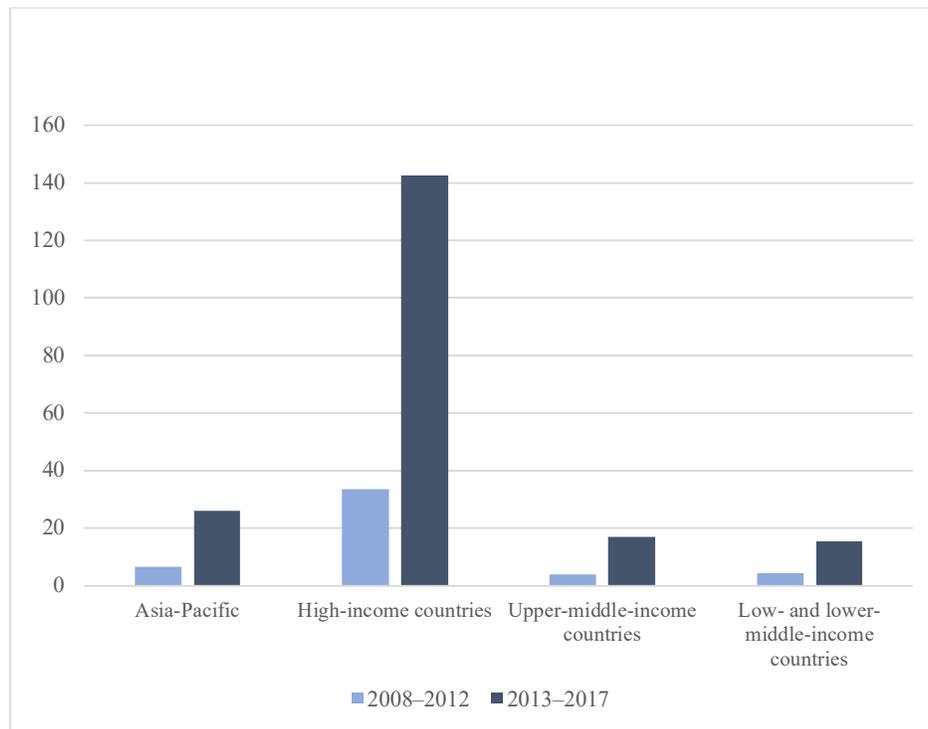
14. The digital divide is also evident in international bandwidth per Internet user. An average Internet user in high-income countries can consume at least eight times the international bandwidth than in lower-income countries (see figure II). Over time, the discrepancy between high- and low-income countries has grown as lower-income countries have lagged further behind.

15. Internet users in locations with poor-quality connectivity are unable to access the same content and services or utilize data-rich content to the same extent as users in locations with high-quality connectivity. In addition, in light of the increasing number of devices connected to the Internet of things and their data communication requirements, as well as the crises and threats to human existence, there is an immediate need for a big push to invest in infrastructure and network configuration and expansion to meet various bandwidth demands from new, emerging and unforeseen services. In the face of an unpredictable future, this investment is necessary to ensure that no one has been left behind by 2030.

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<sup>7</sup> ESCAP, “Estimating the effects of Internet exchange points on fixed-broadband speed and latency”, Asia-Pacific Information Superhighway (AP-IS) Working Paper Series (Bangkok, 2019).

Figure II  
**International Internet bandwidth per Internet user, five-year average**  
 (Kilobits per second)



Source: ESCAP calculations based on ITU, *World Telecommunication/ICT Indicators Database* (see figure I).

#### D. Connecting the last mile

16. On a more positive note, public access solutions such as Wi-Fi have proven critical in reaching groups that cannot afford regular Internet use. With the availability of smartphones continuing to increase for people of all age groups, public Wi-Fi has emerged as an effective and low-cost technology and is increasingly considered one of the preferred means to go online, especially in the context of developing countries and the large data consumption needs of their populations, poor 3G/long-term evolution connectivity and heavy concurrent data usage.

17. Asia and the Pacific has experienced an increase in public Wi-Fi networks, as not only private sector entities but also governments in the region have extended free Wi-Fi services to the public at various locations, including airports, train or bus stations, schools, hospitals and public parks, as part of government policies to achieve broadband for all.<sup>8</sup> Internet access can promote equal opportunities. Specifically, it can reduce inequality between rural and urban areas and effectively broaden opportunities for unserved or underserved communities to access higher-quality health and education services as well as other government services. Globally, the number of people with access to public Wi-Fi is expected to quadruple, from 169 million in 2018 to almost 628 million in 2023. The Asia-

<sup>8</sup> ESCAP, “Connecting the last miles: accelerating inclusive broadband in Asia and the Pacific”, Asia-Pacific Information Superhighway (AP-IS) Working Paper Series (Bangkok, 2020).

Pacific region is expected to lead this growth, with 45 per cent of the global share in 2023 (compared to less than 30 per cent in 2018).<sup>9</sup>

18. However, as underscored by the sudden termination of the popular private sector project, Google Station, government support will be required for users to enjoy the benefits of public Wi-Fi in a stable and predictable way. More direct investment in digital infrastructure and supportive policy frameworks are needed to address difficult-to-reconcile challenges such as promoting private sector participation, protecting consumers and investors and mitigating associated risks. Public-private partnerships thus play an important role with regard to technical expertise, risk sharing and operational capability.

## **E. Digital connectivity and coronavirus disease**

19. The COVID-19 pandemic has coincided with a surge in the design and uptake of digital solutions, tools and services (see ESCAP/CICTSTI/2020/1). These rapid developments have produced a dramatic surge in the demand for bandwidth. According to Akamai, one of the world's largest Internet service providers, global Internet traffic experienced an unprecedented month-on-month increase of 30 per cent in March 2020, compared to normal growth of approximately 3 per cent.<sup>10</sup> Internet traffic peaked at 167 Tbps in March 2020, which was twice as high as the peak in the same month in 2019. In some countries, traffic increased by 45 to 50 per cent immediately after lockdown measures were imposed. Concurrently, real-time data from Ookla, the developer of the Speedtest platform, showed that the average speed of data transmission declined in several countries in the region, including Bangladesh, China, India, Indonesia, the Lao People's Democratic Republic and the Philippines.

20. The sudden surge in Internet usage and drop in performance have raised concerns related to the third pillar of the Asia-Pacific Information Superhighway initiative, namely e-resilience. The situation has inevitably also led to a further widening of the gap between the connected and the unconnected or underconnected, creating an additional layer of inequality between these groups of people in terms of their capacity to cope with the economic impacts of COVID-19, including their capacity to absorb losses or to seize opportunities. During the stay-at-home period, those without high-speed connectivity were unable to adapt to telework or take advantage of e-government support services, and unconnected students fell behind in their education.

21. The current pandemic is thus another wake-up call that underscores the need to invest in e-resilience. Efforts need to be accelerated to boost Internet capacity and expand connectivity to cover the excluded population. There is a clear need for gigabit networks that transfer data at much higher speeds with much lower latency. It is not enough to invest in mobile networks. The networks of the future require much denser infrastructure, with fibre-optic cables traversing the last mile to reach homes. Cost-effective ways to deploy such infrastructure are available (see sect. III). Such ultra-high-speed networks are one of the many essential conditions that must be in place for people to transact every aspect of their lives through the Internet of things, both during the current crisis and in the context of future shocks.

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<sup>9</sup> Cisco, *Cisco Annual Internet Report (2018–2023) White Paper* (2020).

<sup>10</sup> Martin McKeay, "The building wave of Internet traffic", Akamai, 13 April 2020. Available at <https://blogs.akamai.com/sitr/2020/04/the-building-wave-of-internet-traffic.html>.

### III. Asia-Pacific Information Superhighway initiative: subregional responses

22. To address the digital divide, the Asia-Pacific Information Superhighway initiative is focused on four interrelated pillars, namely infrastructure connectivity (promoting investment in ICT infrastructure); efficient Internet traffic and network management (including the establishment of Internet exchange points); e-resilience (ICT infrastructure resilient to natural disasters and other shocks); and affordable broadband access for all. The implementation of the initiative is guided by the Master Plan for the Asia-Pacific Information Superhighway, 2019–2022,<sup>11</sup> the Asia-Pacific Information Superhighway Regional Cooperation Framework Document 2019–2022<sup>12</sup> and the technical working groups set up at the request of member States.

23. The four interrelated pillars are supported by current and future activities proposed by various stakeholders under seven strategic initiatives: the expansion of regional backbone networks; the establishment of Internet exchange points; social and economic impact studies; ICT infrastructure resilience; conducive ICT policy and regulations; capacity-building on ICT issues; and the identification of appropriate funding mechanisms.<sup>13</sup>

24. In its resolution 75/7, the Commission invited members and associate members to consider developing subregional implementation plans for inclusive broadband connectivity through the Asia-Pacific Information Superhighway initiative, on a voluntary basis, and taking into account the specificities of each subregion, including infrastructure sharing and co-deployment of fibre-optic cables along passive infrastructure. It also requested the Executive Secretary to support member countries with policy advice, technical studies and capacity-building and encouraged the participation of various stakeholders to that end.

25. At its third session, held in August 2019, the Asia-Pacific Information Superhighway Steering Committee agreed that member States at the subregional level should discuss detailed requirements and operationalization priorities unique to each subregion.<sup>14</sup> In particular, member States in South-East Asia (Cambodia, the Lao People's Democratic Republic, Myanmar and Viet Nam) and some member States in the Pacific recognized the need to establish expert working groups to identify policy remedies to strengthen Internet traffic and network management.

26. Furthermore, in line with the fourth strategic initiative to support the Asia-Pacific Information Superhighway initiative, focused on enhancing ICT infrastructure resilience in the region, member States recognized the importance of subregional cooperation to improve the cost-effective development of fibre-optic cable infrastructure through infrastructure sharing and co-deployment. As a result, the Governments of Kazakhstan and Kyrgyzstan (North and Central Asia), Mongolia (East and North-East Asia) and Afghanistan, Bangladesh, Bhutan, India, Maldives, Pakistan and Sri Lanka (South and South-West Asia) requested secretariat support for capacity-building workshops and the development of

<sup>11</sup> ESCAP/75/INF/5.

<sup>12</sup> ESCAP/75/INF/6.

<sup>13</sup> ESCAP/CICTSTI/2018/INF/1, table 1.

<sup>14</sup> ESCAP, "Third session of the Asia-Pacific Information Superhighway Steering Committee and WSIS Regional Review, UNCC, Bangkok, 26–27 August 2019, summary report". Available at [www.unescap.org/sites/default/files/Summary%20Report%20-%20Third%20AP-IS%20SC\\_0.pdf](http://www.unescap.org/sites/default/files/Summary%20Report%20-%20Third%20AP-IS%20SC_0.pdf).

appropriate policy guidelines to better coordinate ICT co-deployment projects. Progress in that regard is examined below.

#### **A. Strengthening efficient Internet traffic management for improved speed and latency**

27. The key role of Internet exchange points is to coordinate and link all Internet traffic locally within a country or a group of countries, thereby reducing the transit costs of Internet traffic exchanged internationally, reducing the Internet traffic tromboning effect and improving the quality of domestic users' access through more direct connections to local and cached content. Internet exchange points therefore drastically improve the efficiency of Internet traffic flows by eliminating the need for Internet traffic to flow through expensive long-distance traffic routes lying outside the country of origin.<sup>15</sup>

28. However, establishing an Internet exchange point is complex, especially when multiple countries are involved. Many Internet exchange points are established for non-commercial public service, which requires the collaboration of all Internet service providers in the country. The subsequent success of an Internet exchange point relies on the willingness of competing Internet service providers to cooperate and connect their traffic. Considerable time and resources are required to build trust and convince them of the expected mutual benefits.

##### **1. South-East Asia**

29. The majority of the international Internet traffic routes between Cambodia, the Lao People's Democratic Republic, Myanmar and Viet Nam are exchanged on routes outside the region (in North America or Europe).<sup>16</sup> Table 2 contains a tromboning index summarizing Internet routing between Cambodia, the Lao People's Democratic Republic, Myanmar and Viet Nam. The index is calculated by dividing the entire routing distance by the shortest linear distance (in kilometres). Hence, the longer the actual Internet route between two points, the greater the tromboning index will be.

30. As result, the tromboning index for the Internet traffic between the Lao People's Democratic Republic and Myanmar is inefficient, as is the index for the traffic on the Lao People's Democratic Republic to Cambodia and the Cambodia to Viet Nam routes. In a forthcoming study, ESCAP and the National Information Society Agency of the Republic of Korea have recommended that a carrier-neutral Internet exchange point be established to facilitate the efficient exchange of Internet traffic between these four countries in South-East Asia.<sup>17</sup>

31. In August 2019, ESCAP and the National Information Society Agency hosted a meeting for representatives of Cambodia, the Lao People's Democratic Republic, Myanmar and Viet Nam to review the preliminary findings of a

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<sup>15</sup> For a discussion on the benefits of Internet exchange points, see Internet Society, *Collaborative Draft: The Internet Exchange Point Toolkit and Best Practices Guide – How to Maximize the Effectiveness of Independent Network Interconnection in Developing Regions and Emerging Markets* (2014). Available at [www.ixptoolkit.org/wp-content/uploads/2016/08/Global-IXPToolkit\\_Collaborative-Draft\\_Feb-24.pdf](http://www.ixptoolkit.org/wp-content/uploads/2016/08/Global-IXPToolkit_Collaborative-Draft_Feb-24.pdf).

<sup>16</sup> ESCAP and National Information Society Agency, *Technical Report: A Pre-Feasibility Study on the Asia-Pacific Information Superhighway in the ASEAN Sub-region – Conceptualization, International Traffic and Quality Analysis, Network Topology Design and Implementation Model* (Bangkok, 2016).

<sup>17</sup> *Feasibility Study on Inter-Country IXP for Efficient and Effective Internet Traffic Management in CLMV* (forthcoming).

feasibility study on establishing an Internet exchange point. Member States reviewed and suggested additional issues for consideration in the study. As a follow-up measure, ESCAP and the National Information Society Agency are planning to hold a meeting of an expert working group on Internet exchange points on 9 July 2020. At the meeting, which is expected to be virtual, participants will discuss the findings of the study and guide the secretariat on the next steps in the establishment of a common Internet exchange point.

Table 2  
**Tromboning index**

	<i>Cambodia</i>	<i>Lao People's Democratic Republic</i>	<i>Myanmar</i>	<i>Viet Nam</i>	<i>Thailand</i>
Cambodia	-	32	7	2	5
Lao People's Democratic Republic	11	-	33	4	3
Myanmar	6	3	-	2	6
Viet Nam	28	2	23	-	3

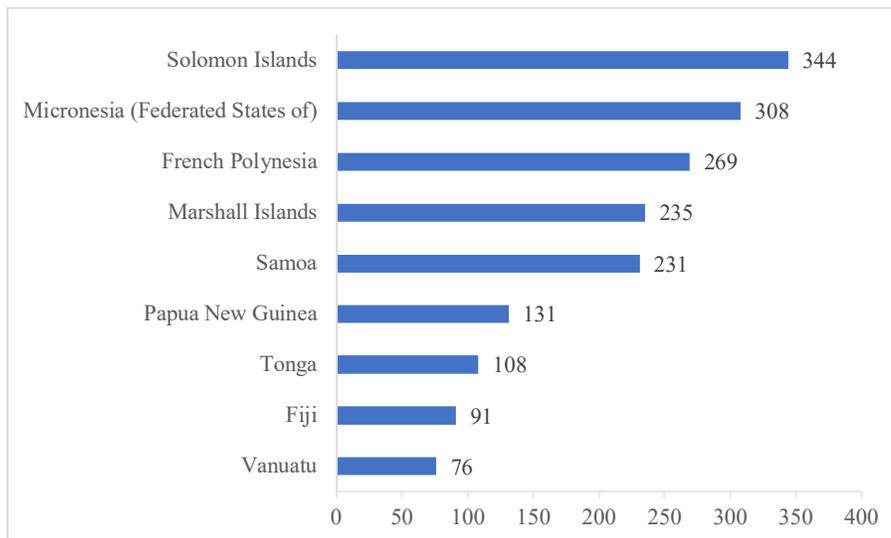
*Source:* ESCAP, “An in-depth study of the Asia-Pacific Information Superhighway in CLMV Countries”, Asia-Pacific Information Superhighway (AP-IS) Working Paper Series (Bangkok, 2020).

*Note:* The tromboning index is calculated by dividing the entire routing distance by the shortest linear distance (in kilometres).

## 2. Pacific

32. Internet latency in the Pacific varies significantly but is generally affected by such factors as inefficient Internet network and traffic management and the long distances fibre-optic cables have to cover. Figure III indicates the combined average national latency of major telecommunications operators for selected Pacific island countries connected to New Zealand.

Figure III  
**Internet latency for selected Pacific island countries connected to New Zealand, December 2019**  
 (Weighted average in milliseconds)



Source: ESCAP calculations based on Layer 10 Telecommunications Strategy and Design, *Pacific-IX Desktop Feasibility Study: Feasibility Study into Subsea Cable Transmission and Establishment of a Pacific Islands Internet Exchange* (December 2019).

33. Higher Internet latency in several Pacific island countries has been linked to the lack of national or international Internet exchange points. In the Pacific, Australia, New Zealand and Papua New Guinea have established neutral Internet exchange points. Fiji, Samoa, Tonga and Vanuatu have established national Internet exchange points, and latency between local operators has improved significantly in those countries. Most of the other Pacific island countries do not have Internet exchange points.

34. The secretariat collaborated with the Internet Society to conduct a feasibility study on establishing a subregional Internet exchange point to better coordinate Internet traffic within the region. The preliminary findings predict significant improvement in Internet latency between selected Pacific island countries and New Zealand (see table 3). The average national latency of the seven Pacific island countries without a subregional Internet exchange point was 187 milliseconds. However, if Internet exchange points in Fiji, New Zealand and Samoa were connected to coordinate the traffic using the shortest route, it could drastically reduce average latency by up to 94 per cent, to 6 milliseconds.<sup>18</sup>

35. The main findings of the feasibility study<sup>19</sup> were shared at the meeting of an expert working group on establishing a Pacific Internet exchange point, held in December 2019. The expert working group requested ESCAP to conduct a second

<sup>18</sup> A similar result was found when an Internet exchange point was established in Kenya for neighbouring countries in Africa. See ESCAP and National Information Society Agency, *Feasibility Study*.

<sup>19</sup> ESCAP, “Estimating the effects of Internet exchange points on fixed-broadband speed and latency”.

study on developing an operational model for a Pacific Internet exchange point.<sup>20</sup> The preliminary findings of the second study will be presented at the second meeting of the expert working group, to be held in August 2020. Key outcomes from the second meeting will be presented as the subregion’s input to the Asia-Pacific Information Superhighway Steering Committee at its fourth session, to be held on 11 August 2020.

Table 3  
**Estimated change in latency for selected Pacific island countries connecting to New Zealand, if Internet exchange points in Fiji, New Zealand and Samoa were connected**

<i>Country</i>	<i>National latency without subregional Internet exchange point (weighted average in milliseconds)</i>	<i>Estimated latency with subregional Internet exchange point (weighted average in milliseconds)</i>	<i>Percentage change</i>
Vanuatu	76	2.55	-97
Fiji	91	11.24	-89
Tonga	108	1.47	-99
Samoa	231	2.13	-98
French Polynesia	269	13.16	-87
Solomon Islands	344	3.69	-96
<b>Average</b>	<b>187</b>	<b>6.00</b>	<b>-94</b>

*Source:* ESCAP calculations based on Layer 10 Telecommunications Strategy and Design, *Pacific-IX Desktop Feasibility Study* (see figure III).

**B. Improving the efficiency of fibre-optic cable infrastructure development through infrastructure sharing and co-deployment**

36. Co-deployment of fibre-optic cables along utility infrastructure including roads, railways and power grids is one way of reducing investment costs and supporting the expansion of broadband connectivity. Approximately 80 to 90 per cent of fibre-optic cable deployment costs are related to excavation work and obtaining right of way. Co-deployment is one cost-effective way of bringing connectivity to the unconnected, as a single excavation can serve multiple functions.

37. In addition, co-deployment of fibre-optic cables will reduce the need for often complex procedures as well as the cost and time of seeking right of way or permission from multiple entities to deploy fibre-optic cables. Co-deployment of fibre-optic cables along utility infrastructure has been implemented successfully in several countries in Asia, including Bangladesh, Bhutan, China, India, Myanmar, the Republic of Korea, the Russian Federation, Thailand and Turkey, among

<sup>20</sup> ESCAP, “First session of the Asia-Pacific Information Superhighway (AP-IS) Working Group on ‘Strengthening efficient Internet traffic management through a subregional Internet Exchange Point (IXP) in Pacific Island Countries’, University of the South Pacific, Laucala Campus, 3–5 December 2019, conclusions and recommendations”. Available at [www.unescap.org/sites/default/files/Conclusions%20and%20Recommendations\\_2.pdf](http://www.unescap.org/sites/default/files/Conclusions%20and%20Recommendations_2.pdf).

others.<sup>21</sup> However, co-deployment of ICT along utility infrastructure still faces regulatory challenges.

### 1. Subregional cooperation in North and Central Asia and North and North-East Asia

38. The secretariat conducted studies in three pilot countries, namely Kazakhstan, Kyrgyzstan and Mongolia. The studies show that a lack of enabling domestic policies and coordination among ministries hinders ICT infrastructure co-deployment prospects. While some domestic policies in Kazakhstan provide opportunities for co-deployment, rules and procedures for granting access to road transport infrastructure remain absent, as do methods for determining fees related to infrastructure access and maintenance. Coordination and cooperation on co-deployment between government agencies and private companies are also lacking.<sup>22</sup>

39. In Kyrgyzstan, the main obstacles affecting ICT infrastructure co-deployment were the absence of transparent regulatory mechanisms and the lack of awareness about the associated benefits. Other factors affecting co-deployment along road infrastructure included the lack of approved standards for the construction and operation of fibre-optic links; difficulties in land acquisition for the construction of fibre-optic lines; and, in some cases, a refusal of permission by road transport owners for the construction of fibre-optic lines in certain zones of highways.<sup>23</sup>

40. In October 2019, ESCAP consulted policymakers in Kazakhstan and Kyrgyzstan and developed a toolkit for assessing the compatibility of ICT infrastructure co-deployment with road transport and energy infrastructure.<sup>24</sup> The toolkit included a methodology to assess co-deployment compatibility on the basis of technical, economic and social parameters in the context of selected road transport and energy infrastructure projects in the two countries. The toolkit was used in Kazakhstan to determine that prospective projects for a fibre-optic cable line between Uralsk and Ozinki and a highway connecting Uralsk, Taskala and Ozinki were compatible for co-deployment, and that prospective projects for a fibre-optic cable line and a 500-kilovolt electric line between Datka, Kyrgyzstan, and Hujant, Tajikistan, were compatible for co-deployment as well.

41. The first of its kind, this toolkit provides useful guidelines for policymakers to match ICT infrastructure projects with road transport and energy infrastructure projects. Widespread development of road transport and energy infrastructure in most countries in the region has created multiple opportunities for cost-effective deployment of fibre-optic cables. In addition, as various stakeholders and organizations involved in the ICT infrastructure co-deployment process must work together to meet the intensive data requirement of the toolkit, it therefore helps to strengthen coordination and cooperation. Lastly, the toolkit helps policymakers to

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<sup>21</sup> Additional information on co-deployment implementation in these countries is available at [www.unescap.org/our-work/ict-disaster-risk-reduction/asia-pacific-information-superhighway/resources](http://www.unescap.org/our-work/ict-disaster-risk-reduction/asia-pacific-information-superhighway/resources).

<sup>22</sup> ESCAP, “An in-depth national study on ICT infrastructure deployment with road transport and energy infrastructure in Kazakhstan: part I”, Asia-Pacific Information Superhighway (AP-IS) Working Paper Series (Bangkok, 2020).

<sup>23</sup> Ibid.

<sup>24</sup> ESCAP, “Toolkit for ICT infrastructure co-deployment with road transport and energy infrastructure”, Asia-Pacific Information Superhighway (AP-IS) Working Paper Series (Bangkok, 2020).

identify the domestic policies in need of revision in order to facilitate co-deployment.

42. In Mongolia, investment in fibre-optic cable infrastructure (including co-deployment with other infrastructures) encountered challenges including the lack of right of way, relevant standards or coordination between relevant stakeholders and the unavailability of funds for investment.<sup>25</sup> The lack of institutional or regulatory mechanisms often makes it difficult for stakeholders to share vital information with one another, such as the cost of civil works. In addition, the country lacks a uniform regulatory mechanism or standardization policy governing fibre-optic cable deployment.

43. The secretariat and the International Think Tank for Landlocked Developing Countries hosted an expert consultation workshop in Mongolia in 2019. The workshop brought together government officials and experts working on various dimensions of infrastructure development, including ICT, transport, energy, disaster management, social policies and financing. The participants recognized that the National Development Agency of Mongolia was best positioned to coordinate co-deployment. They also recommended that the National Development Agency facilitate the work of an inter-agency working group to coordinate among various government units and telecommunications operators with regard to policy on sustainable investments in co-deployment initiatives.<sup>26</sup> In addition, the inter-agency working group would review the harmonization of workflow among development policies and plans at the sectoral, subnational, national and regional levels.

44. In line with the national priorities and needs identified at the workshop, follow-up national consultation workshops will be held virtually in July 2020 to further enhance awareness and strengthen the capacity of government officials in the target countries with regard to the practical implementation of the guidelines, in line with national priorities and needs. The aim is to enable officials to propose policy measures and strategies that leverage cross-sectoral synergies to promote e-resilience and bring broadband to all in cost-effective ways. Sustainable financing for transboundary infrastructure projects will also be discussed.

## 2. South and South-West Asia

45. The challenges for ICT infrastructure co-deployment in South and South-West Asia include difficulties in acquiring land or obtaining permission for land use from land authorities and private landowners, which create uncertainty and delays in the roll-out of planned ICT infrastructure. The lack of uniform and transparent pricing policies governing co-deployment license fees has the same effect. The lack of fibre-optic cable deployment standards and of ICT infrastructure co-deployment coordination poses another challenge.<sup>27</sup>

<sup>25</sup> ESCAP, “Research report on ICT infrastructure co-deployment with transport and energy infrastructures in Mongolia”, Asia-Pacific Information Superhighway (AP-IS) Working Paper Series (Bangkok, 2020).

<sup>26</sup> ESCAP, “Addressing the transboundary dimensions of the 2030 Agenda through regional economic cooperation and integration in Asia and the Pacific: Mongolia’s expert consultation workshop, 21–22 November 2019, UN House, Ulaanbaatar, Mongolia”. Available at [www.unescap.org/sites/default/files/Policy%20Recommendations\\_final.pdf](http://www.unescap.org/sites/default/files/Policy%20Recommendations_final.pdf).

<sup>27</sup> ESCAP, *Co-deployment of Fibre Optic Cables along Transport Infrastructure for SDGs Including Cross Border* (Bangkok, 2018).

46. The secretariat and the Asian Institute of Transport Development conducted a study on the co-deployment of fibre-optic cables including in selected countries, in South Asia, namely Bangladesh, Bhutan and India.<sup>28</sup> According to the study, in a majority (77 per cent) of the countries surveyed fibre-optic cables are co-deployed along the right of way of roads. The findings highlighted the importance of establishing a single government agency to coordinate and enforce directives on co-deployment and of encouraging stronger and transparent policies on right of way, leasing and sharing rates. In addition, the findings highlighted the importance of developing a central repository of maps, policy experiences, regulations and standards in the form of an online platform to assist all stakeholders with existing and future plans.

47. In 2019, the secretariat and the Asian Institute of Transport Development hosted a subregional capacity-building workshop on ICT infrastructure co-deployment along passive infrastructure. The objective of the workshop was to raise awareness and facilitate constructive dialogue between government officials responsible for ICT and transport about opportunities and challenges in implementing policies on cross-border infrastructure co-deployment. The participants of the workshop recognized that while co-deployment had been in practice at the national level in some countries for more than 20 years, there were gaps in cross-border co-deployment. They also noted that some examples of co-deployment at the national level, including RailTel in India, could be a source of best practices for neighbouring countries.

#### **IV. Capacity-building to facilitate the use of information and communications technology for inclusive and sustainable development**

48. Addressing the digital divide and enabling the emergence of dynamic and inclusive digital economies is dependent on digital infrastructure that is e-resilient, efficient and cost-effective. This, however, is not enough. Building widespread digital skills is also crucial, as it allows individuals, businesses and governments to harness the opportunities and guard against the risks of digital connectivity.

49. The work of ESCAP dedicated to assisting member States in strengthening their human and institutional capacities to utilize ICT is carried out by the Asian and Pacific Training Centre for Information and Communication Technology for Development. Established in June 2006, the Asian and Pacific Training Centre conducts demand-driven training programmes, provides advisory services, facilitates knowledge-sharing and fosters multi-stakeholder dialogue on ICT capacity development in the region.

50. The Centre's activities contribute to ESCAP subprogramme 5 on information and communications technology and disaster risk reduction and management. In the strategic framework for the period 2018–2019, the Centre contributes to expected accomplishment (c) on strengthened capacity of member States to use information and communications technology, space technology applications and disaster risk reduction and management for resilient and sustainable development.

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<sup>28</sup> The focus of the study is on national and cross-border co-deployment of fibre-optic cables in China, India, the Republic of Korea, the Russian Federation, Thailand and Turkey; however, to the extent that the study involves cross-border fibre-optic cables from additional countries, those countries are also included.

51. The Governing Council of the Asian and Pacific Training Centre for Information and Communication Technology for Development, composed of representatives of eight member States and one representative nominated by the host country, the Republic of Korea, reviews the Centre's administration and financial status as well as the implementation of its programme of work and provides strategic advice on future programmes and activities. At the seventy-fourth session of the Commission, held from 11 to 16 May 2018, the following member States were elected to the Council for the period from 2018 to 2021, in addition to the Republic of Korea: Bangladesh, Cambodia, India, Indonesia, the Philippines, the Russian Federation, Sri Lanka and Thailand.

#### **A. Activities implemented since the second session of the Committee on Information and Communications Technology, Science, Technology and Innovation**

52. The Centre's activities are implemented under three flagship initiatives: (a) the Academy of ICT Essentials for Government Leaders; (b) the Women ICT Frontier Initiative; and (c) the Primer Series on ICT for Development for Youth.

##### **1. Academy of ICT Essentials for Government Leaders**

53. The Academy of ICT Essentials for Government Leaders is the Centre's flagship training programme for policymakers and civil servants. It consists of a comprehensive ICT for development curriculum and is implemented in the region through training-of-trainers activities and workshops for policymakers and civil servants. The Centre works closely with ICT ministries, civil service training institutes and other training providers to institutionalize and integrate the training programme into efforts to develop human resources in the civil service.

54. **Content development.** In December 2018, the Centre launched a new Academy module: Realizing Data-Driven Governance. The Centre also began updating existing Academy modules to reflect the latest ICT trends and technologies. These include the following: Overview of ICTs and Sustainable Development (module 1); Information Security and Privacy (module 6); ICT and Disaster Risk Management (module 9); and Social Media for Development (module 11).

55. **Regional and national implementation.** The Centre implements the Academy initiative in the region through a combination of training-of-trainers activities and national workshops for policymakers and civil servants. The training-of-trainers activities in particular help to expand the pool of human resources capable of delivering training at the national level.

56. **Regional training-of-trainers event on data-driven governance.** The Centre held the regional training-of-trainers event on data-driven governance in Incheon, Republic of Korea, from 5 to 7 December 2018, marking the regional roll-out of the Centre's newest training module. The event was attended by 22 government officials and trainers nominated by ICT ministries, data agencies, civil service organizations and training institutions in the region.

57. **Country-level training activities.** The Centre continued its cooperation with national partners to implement training-of-trainers activities and national workshops for policymakers and civil servants. Over the reporting period, the following training activities were conducted:

- (a) Workshop on e-government, ICT trends for government leaders and information security and privacy, held in Lower Myanmar from 19 to 23 March 2018 (30 participants);
- (b) Workshop on ICTs and sustainable development and ICT trends for government leaders, held in Upper Myanmar from 2 to 5 July 2018 (50 participants);
- (c) Philippines training-of-trainers event on data-driven governance, held in Manila from 26 to 28 February 2019 (49 participants);
- (d) Cambodia training-of-trainers event on data-driven governance, held in Phnom Penh from 30 April to 3 May 2019 (34 participants);
- (e) Lao People's Democratic Republic national workshop on ICT for development policy, processes and governance, held in Vientiane on 2 and 3 July 2019 (37 participants);
- (f) Myanmar training on social media for development, held in Pyin Oo Lwin on 7 and 8 August 2019 (30 participants);
- (g) Philippines training-of-trainers event on digital local government, held in Manila from 24 to 26 September 2019 (20 participants);
- (h) Kazakhstan national workshop on data-driven governance, held in Nur-Sultan on 7 October 2019 (33 participants);
- (i) Bhutan training-of-trainers event on data-driven governance, held in Thimphu from 23 to 25 October 2019 (20 participants);
- (j) Myanmar training on ICTs and sustainable development, held in Hpaung Gyi (East) on 13 and 14 November 2019 (41 participants).

58. **Partner-led activities.** Many of the Academy's partners, including ICT ministries and training institutes, continue to use the Academy modules in their capacity-building initiatives. In Myanmar, for example, the Union Civil Service Board has integrated the Academy into its executive officials management course. In the Philippines, the Department of Information and Communications Technology and the Career Executive Service Board have integrated the Academy modules into their regular training offerings. During the reporting period, the Academy programme has reached approximately 4,000 officials who have participated in the Academy programme through training events held by the Centre's partners in 13 countries.<sup>29</sup>

59. **Knowledge-sharing, information and communications technology, and coronavirus disease.** The disruption of human lives and economic activities around the world caused by COVID-19 has underscored the urgent need to assist member States in using ICT-based solutions in their responses to the pandemic. Recognizing the success of the Republic of Korea in using ICT for that purpose, the Centre held a webinar on how the Republic of Korea turned the tide on COVID-19 using ICT, on 28 April 2020. With more than 300 participants connected virtually from around the world, the webinar served to introduce the policies and practices implemented in the Republic of Korea with regard to the use of digital technologies in testing, tracing and treating COVID-19 infections. It also provided a platform for dialogue on challenges that may be encountered in other countries in implementing digital solutions to address the virus.

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<sup>29</sup> Bhutan, Cambodia, India, Indonesia, Kazakhstan, Kyrgyzstan, the Lao People's Democratic Republic, Myanmar, Pakistan, the Philippines, Tajikistan, Thailand and Turkmenistan.

## 2. Women ICT Frontier Initiative

60. Launched in June 2016, the Women ICT Frontier Initiative is an integrated ICT and entrepreneurship training programme for women entrepreneurs and policymakers. Its aim is to strengthen the capacity of current and potential women entrepreneurs to utilize ICT in support of their businesses and the capacity of policymakers to create an enabling environment for ICT-empowered women entrepreneurs.

61. Since its regional launch in June 2016, the Women ICT Frontier Initiative has been rolled out in Sri Lanka (September 2016), Cambodia (December 2016), Bangladesh (June 2017), the Philippines (August 2017) and Armenia (September 2017) and launched at the subregional level in Central Asia (April 2017) and in the States members of the Association of Southeast Asian Nations (August 2017).

62. In February 2018, the Centre launched the Initiative in the city of Tirupati in Andhra Pradesh, India, in partnership with Sri Padmavati Mahila Visvavidyalayam (Women's University). Following the launch, a training-of-trainers event, held from 20 to 22 February 2018, was attended by 97 participants including officials and trainers from various districts, universities, training institutions, self-help groups and associations of women entrepreneurs.

63. With strong ownership and support from national partners, the Initiative has begun to benefit an increasing number of women entrepreneurs. National partners have also demonstrated their commitment to sustaining the programme by continuing to use it and integrate it into their own initiatives. Examples include the following:

(a) In Cambodia, in 2019, the One Village One Product programme under the Council for Agricultural and Rural Development of Cambodia trained 849 women entrepreneurs from 11 provinces on ICT for planning and managing a business;

(b) In Bangladesh, the national ICT Division has trained more than 5,300 women on ICT for business management since the launch of the Initiative in 2017, integrated the Initiative into its programme and set a target to train 30,000 women by 2021;

(c) In the Philippines, in 2018, the Department of Information and Communications Technology worked with Connected Women and Facebook to launch the Women Empowerment ICT initiative, which is aimed at empowering Filipinas by strengthening their economic and digital literacy skills, and which utilizes customized Women ICT Frontier Initiative modules to train women owners of small and medium-sized enterprises;

(d) In Sri Lanka, the Information and Communication Technology Agency and the Ministry of Women and Child Affairs customized the Initiative to benefit female heads of household in post-conflict Sri Lanka in a programme known as the Women ICT Frontier Initiative Suhuruliya (Smart Women), which offers training modules translated to Sinhalese and Tamil as well as audiobook versions for wider dissemination.

64. The Centre is collaborating with the Social Development Division and Trade, Investment and Innovation Division of ESCAP in the implementation of a five-year project on catalysing women's entrepreneurship, funded by the Government of Canada through its Global Affairs Canada department. The project, which began in April 2018, is aimed at addressing key barriers faced by women entrepreneurs in six countries (Bangladesh, Cambodia, Fiji, Nepal, Samoa and

Viet Nam) through interventions in policy development and the regulatory environment; access to finance and credit; and access to ICT and capacity-building.

65. The Centre is responsible for implementing the project's ICT component, which consists of capacity-building activities for policymakers and women entrepreneurs. The Centre held the training-of-trainers event on basic financial management and ICT tools for women entrepreneurs in Phnom Penh from 5 to 7 November 2019. The training helped to build the capacity of trainers in Cambodia to deliver basic training on business financial management, including the use of a mobile bookkeeping app, to women micro-entrepreneurs in the country. It was attended by 46 trainers from 10 training providers who committed to train more than 700 women micro-entrepreneurs.

66. While the Women ICT Frontier Initiative has been officially launched in six countries, its resources have also been used by partners in other countries. The Lao Women's Union, for example, uses the policy module to train government officials and civil servants. Over the reporting period, national partners from 10 countries<sup>30</sup> conducted trainings related to ICT and women entrepreneurship using the Initiative's training content, benefiting nearly 2,500 policymakers and women entrepreneurs.

### **3. Primer Series on ICT for Development for Youth**

67. The aim of the Primer Series on ICT for Development for Youth is to impart key knowledge about ICT for sustainable development to students and youth. It includes learning resources on digital development for use by colleges, universities and training institutions in the region.

68. The Primer Series currently consists of five primers: An Introduction to ICT for Development (primer 1); Project Management and ICT for Development (primer 2); ICT for Disaster Risk Management (primer 3); ICT, Climate Change and Green Growth (primer 4); and Exploring Social Media's Role in Development (primer 5). These learning resources are used by educators at academic institutions and training institutes, both in classroom teaching and training activities.

69. Colleges, universities and training institutes from nine countries<sup>31</sup> reported that they included the Primer Series in their course materials, reaching nearly 10,000 students and participants. For example, the University of Indonesia in Depok introduced the Primer Series as a learning resource for use by 8,000 students.

### **4. Advisory services**

70. Upon request from member States, the Centre provides technical assistance and advisory services in the development of ICT policy and the implementation of capacity development programmes. The Centre also advises Governments, universities and training partners on how to institutionalize its three flagship initiatives in the context of their own capacity-building initiatives.

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<sup>30</sup> Bangladesh, Bhutan, Cambodia, India, Kazakhstan, the Lao People's Democratic Republic, Pakistan, Tajikistan, Thailand and Turkmenistan.

<sup>31</sup> Bangladesh, Cambodia, Indonesia, Kazakhstan, Myanmar, Nepal, the Philippines, Tajikistan and Thailand.

71. Specific requests for assistance have been received from the Government of Maldives on the development of its digital government policy and the provision of customized training on digital government to policymakers; from the Government of Bhutan on the development of its media policy framework; and from the Government of the Lao People’s Democratic Republic on the development of its national digital transformation plan.

**5. Virtual Academy**

72. The Virtual Academy of the Asian and Pacific Training Centre for Information and Communications Technology for Development is the online distance-learning platform for the Centre’s three flagship initiatives. It is integral to the Centre’s strategy of diversifying the delivery channels for its capacity-building activities. Since its launch in 2009, the Virtual Academy has received a total of 12,236 course enrolments.

73. The Centre added new online courses on realizing data-driven governance; ICTs and sustainable development; and women’s empowerment and entrepreneurship through ICT, based on the respective modules of the Academy of ICT Essentials for Government Leaders and the Women ICT Frontier Initiative. Recognizing the linguistic diversity in the Asia-Pacific region, the Centre works closely with national partners in offering its courses in multiple languages. For example, the Vietnamese version of the Academy module on ICT, climate change and green growth was launched in August 2018.

**6. Strategic partnerships**

74. The Centre continues to forge partnerships with national ministries and agencies; civil service institutes; regional organizations and networks; United Nations system entities; academic and research institutions; civil society; the private sector; and the host country Government and agencies. Leveraging partnerships is critical to the sustainability of the Centre’s capacity development work. The Centre cooperates closely with its partners who contribute at all stages of programme implementation, from conceptualization and development of training content to delivery and roll-out at the regional, subregional and national levels.

**7. Governing Council**

75. The Governing Council meets annually to review the Centre’s administrative and financial status, implementation of its work programme and the development of its work plan for the coming year. The thirteenth session of the Council was held in Bangkok on 31 August 2018 in conjunction with the second session of the Committee on Information and Communications Technology, Science, Technology and Innovation. The fourteenth session was held in Incheon, Republic of Korea, on 28 November 2019.

**V. Issues for consideration by the Committee**

76. In view of the progress, opportunities and challenges outlined above, the Committee may wish to provide guidance to the secretariat on the Asia-Pacific Information Superhighway initiative and on the work of the Asian and Pacific Training Centre for Information and Communication Technology for Development. The Committee may wish to consider taking the following actions:

- (a) To note the progress made in implementing the outcomes of the third session of the Asia-Pacific Information Superhighway Steering Committee, as summarized in the present document;
  - (b) To encourage member States and partner organizations to continue supporting the implementation of the Master Plan for the Asia-Pacific Information Superhighway, 2019–2022, and the Asia-Pacific Information Superhighway Regional Cooperation Framework Document, 2019–2022, through financial and in-kind contributions;
  - (c) To request the secretariat to develop the next phase of the master plan for the period 2023–2026, building on the existing Master Plan for the Asia-Pacific Information Superhighway, taking into account the 2030 Agenda for Sustainable Development, the regional dimensions of the World Summit on the Information Society and the need to respond and build resilience to pandemics such as COVID-19, for consideration and adoption by the Committee at its fourth session, to be held in 2022;
  - (d) To identify and provide further guidance on programmes and activities that may be implemented by the Centre to assist member States in deploying ICT-based solutions to address the COVID-19 pandemic;
  - (e) To identify priority areas and activities that could be pursued by the Centre through its flagship initiatives to support the enhanced understanding and use of ICT in the implementation of the 2030 Agenda.
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