Towards a more integrated telecom market in the Pacific: Strengthening the statistical evidence for implementation of the Asia-Pacific Information Superhighway

19-23 November 2018
Nadi, Fiji

Summary Report

ICT and Development Section
ICT and Disaster Risk Reduction Division

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Abbreviations and Acronyms

AGM	Annual General Meeting
AP-IS	Asia-Pacific Information Superhighway
APCICT	Asian and Pacific Training Centre for Information and Communication Technology for Development
CROP	Council of Regional Organisations of the Pacific
EPIC	Every Policy is Connected
ESCAP	Economic and Social Commission for Asia and the Pacific
GIS	Geographic Information System
ICT	Information and Communications Technology
IDI	ICT Development Index
ITU	International Telecommunication Union
IXP	Internet Exchange Point
PITA	Pacific Islands Telecommunications Association
PRISAP	Pacific Regional ICT Strategic Action Plan
SDG	Sustainable Development Goal
SIDS	Small Island Developing States
SPC	Pacific Community
TCC	Tonga Communications Corporation
UNDP	United Nations Development Programme
USP	University of the South Pacific

Session 1: Opening remarks

1. Mr. Iosefa Maiava, Head, Subregional Office for the Pacific, United Nations Economic and Social Commission for Asia and the Pacific (ESCAP), inaugurated the workshop with an opening statement. He started by welcoming participants and thanking the co-organizers of this subregional workshop – the International Telecommunication Union (ITU) and the Pacific Islands Telecommunications Association (PITA) – for their generous contributions and support in the organization of the workshop. He stated that this workshop marks a significant step towards fostering the use of information and communications technology (ICT) for resilient and sustainable development in Pacific island countries, by strengthening the analytical capacity of government officials in making use of national statistics to identify the digital divide. He encouraged participants to engage with each other and share experiences during the workshop. He noted the drawback of duplications in Pacific ICT plans, and informed that ESCAP is working together with international and regional organizations such as ITU and PITA to leverage synergies, reduce duplications, raise efficiency and enhance the impact of interventions.

2. Mr. Ioane Koroivuki, Regional Director, Asia and the Pacific Telecommunication Development Bureau, ITU, began his presentation stating that the subregional workshop is timely as the ICT industry has become the critical backbone of socioeconomic development. He recalled that in 2015, ITU and the Government of Tonga organized a ministerial meeting together with other partners, including the University of the South Pacific (USP) as Chair of the Council of Regional Organisations of the Pacific (CROP). The meeting clearly recognized ICT as a key tool for development, with enormous potential for socioeconomic development, governance and sustainable livelihood for the people in the Pacific. ICT was also recognized as an increasingly important tool for achieving development priorities under the Sustainable Development Goals (SDGs) and the Small Island Developing States (SIDS) Accelerated Modalities of Action Pathway, as well as disaster risk management and response, and safety and security. Mr. Koroivuki noted that while international connectivity to the Pacific islands has improved significantly over the last decade, challenges remain. The geography of the region, the small scale of island economies and the high capital cost of submarine cables mean that most Pacific islands rely solely on geostationary satellites for Internet access with international bandwidth consequentially remaining expensive and restricted. For digital transformation to fully materialize, innovative approaches to policy and regulation are now required.

3. On behalf of Mr. Sione Veikoso, President, PITA, Mr. Fred Christopher, Manager, PITA, stated that a superfast broadband connection through the Asia-Pacific Information Superhighway (AP-IS) will make a positive impact on the lives of Pacific islanders, helping them work more productively and get online faster. He emphasized the importance of working together for common needs and benefits. He recalled a key recommendation from an ESCAP study on broadband

connectivity in the Pacific that stated the need to link national efforts to subregional mechanisms and plans. PITA supports this recommendation as it could lead to upscaling of interventions and attract investments from industry and key players for building the necessary infrastructure in the Pacific. This could bridge gaps and help Pacific islands become part of the AP-IS, as well as prepare Pacific islanders for leveraging the opportunities of the AP-IS.

4. The workshop moved on to self-introductions by participants (see list of participants in Annex 3), and proceeded to Session 2 as per the agenda (see Annex 2).

Session 2: Asia-Pacific Information Superhighway (AP-IS) initiative

5. Mr. Siope Vakataki 'Ofa, Economics Affairs Officer, ESCAP, started the session by outlining the objectives of this subregional workshop. They are to identify common ICT priorities in the Pacific island countries in light of various ICT plans (national/subregional/regional), and strengthen the statistical evidence-based analysis for a more integrated telecom market in the Pacific. He proceeded to explain the AP-IS initiative, and its four pillars and seven strategic initiatives, and provided an update on the AP-IS Master Plan.

6. Mr. Kisione Finau, Director of Information Technology, USP and Chair of the CROP ICT Working Group, delivered his presentation on the Pacific Regional ICT Strategic Action Plan (PRISAP). He noted that the PRISAP was formulated in response to a call from Pacific ICT ministers at the ICT Minister's Meeting in Tonga in 2010 for greater coordination in effectively utilizing ICT for sustainable development, governance and improved livelihoods among Pacific communities. The PRISAP is comprised of five specific themes and is coordinated by USP in the period between 2015 and 2020, with a mid-term review in 2019. The first set of themes focuses on leadership, governance, coordination and partnership. Related to this first theme, Mr. Finau reported that an ICT ministerial session was held during the PITA Annual General Meeting (AGM) in 2017 and 2018. The 2017 ministerial session discussed cybersecurity and submarine cable infrastructure development, and emphasized the need for subregional cooperation in ICT development. The 2018 ministerial session again discussed cybersecurity, as well as the need to consolidate efforts and work together to implement e-government. In June 2018, at the Digital Pacific Conference hosted by Samoa, participants discussed the development of a national e-governance policy for Samoa that can be shared with other Pacific island countries. At the conference, the United Nations Development Programme (UNDP) Samoa offered to support the Digital Pacific Conference on an annual basis. In 2019, USP is planning to host a Stakeholders Meeting.

7. Mr. Kisione Finau proceeded to provide an update on the PRISAP's second theme on ICT policy, legislation and regulatory framework. He noted that most Pacific

island countries have progressed well in the development of national ICT policies, but is lacking in the legal admissibility of electronic records as evidence and data protection legislations. He moved on to explain the third theme on ICT infrastructure and universal access, and highlighted Pacific island countries' progress in cross-border submarine cable connectivity – with all islands either connected with at least one submarine cable or planning to connect to one. Mr. Finau, however, indicated a continuous need to address the fourth theme on ICT human capacity building and cybersecurity. USP has several capacity building initiatives focused on cybersecurity in Tonga and Papua New Guinea, and is planning to establish a Centre of Excellence (funded by the World Bank) for ICT capacity building. The Cook Islands has established a similar Centre of Excellence for ICT (funded by India). Moreover, the Pacific Cybersecurity Operational Network, supported by the Australian Cyber Emergency Response Team, has recently been established to strengthen subregional information sharing on cybersecurity issues. Mr. Finau noted that the fifth theme on financing, monitoring and evaluation that aims to promote a sustainable financing mechanism for the ICT sector with a comprehensive monitoring and evaluation framework is ongoing.

8. Following the presentations, participants reflected on the current progress of implementing the PRISAP, and emphasized the importance of subregional coordination and cooperation in the Pacific towards bridging the digital divide, leveraging synergies and avoiding duplications.

9. Mr. Fred Christopher, Manager, PITA, pointed out that PITA's AGM is an existing subregional activity held every year, bringing together ICT ministers and government officials, regulators, telecom operators, and related private sector organizations to improve ICT connectivity. Mr. Christopher proposed to hold the AP-IS Pacific Subregional Meeting as a side event of the AGM to track progress of AP-IS activities in the Pacific. He informed that formal invitations to ESCAP, ITU and other stakeholders will be sent out for the 2019 AGM (tentatively planned to be held in Fiji). He advised that the 2019 AGM will be a great opportunity to present the AP-IS initiative to a larger audience (100+ participants) of ICT stakeholders, including ICT ministers. Mr. Christopher stated that PITA looks forward to further collaboration with ESCAP, ITU and other stakeholders in advancing the development of ICT connectivity in the Pacific.

Session 3: Infrastructure connectivity – Towards a more integrated market

10. Mr. Lealailepule Rimoni Aiafi, Associate (Vice) Minister of ICT, Samoa, opened his remarks by highlighting the unique set of developmental challenges for Pacific SIDS, including small isolated markets and populations, the negative impacts of climate change, and heavy reliance on private remittances. However, he noted that Pacific island countries can overcome these challenges at the regional level

through relevant digital initiatives that are built on timely exchanges of information in a cooperative and transparent manner.

11. Mr. Kisione Finau, Director of Information Technology, USP and Chair of the CROP ICT Working Group, pointed out that the Pacific has 27 countries and territories scattered across the world's largest ocean, and most have small populations. Nevertheless, all Pacific island countries have a satellite communication system that is used mostly for back up and redundancy. He stressed that land ownership is an important component in the development of satellite communication in Papua New Guinea. Mr. Finau believed that satellite will continue to play a major role in connecting the Pacific islands. However, satellite service providers need to diversify their services, for example, with cloud services for communication, business productivity and online banking, among others.

12. Mr. George Samisoni, Chief Executive Officer, Fiji International Telecommunications Limited, began his presentation stressing that bandwidth is key for the development of different ICTs. He noted that Fiji has developed several submarine cables since 1902, and Fiji is now connected to the Hawaiki Submarine Cable, Cora Sea Cable System, East Micronesia Cable, Manatua Cable, Southern Cross Cable (upcoming) and Interchange Cable Network 2. He emphasized the important role of Internet exchange points (IXPs) in reducing the cost of connectivity and improving the speed, latency and quality of Internet services, thus boosting the Internet economy and the ability to support emerging technologies and services. He informed that approximately 50 per cent of Internet traffic in Fiji is to Google and YouTube, 25 per cent to Facebook, and 10 per cent to content hosted locally.

13. Following the presentations, participants emphasized the need to continue strengthening national legislations and regulatory policies for cybersecurity and e-government services in Pacific island countries. Mr. Ioane Koroivuki, Regional Director, Asia and the Pacific Telecommunication Development Bureau, ITU, informed that ITU continues to provide advisory services on the drafting of cybersecurity legislations to Pacific island countries. In addition, participants requested that a Pacific digital transformation strategy be developed to advance broadband connectivity.

Session 4: Internet traffic and network management

14. Mr. Iki Tu'itavake, Chief Technical Officer, Tonga Communications Corporation (TCC), delivered his remarks by stating that TCC provides various Internet services, including 2G, 3G, 4G, ADSL 2+, fibre optic to buildings, fibre optic lease lines and copper lease lines. He informed that the TCC mobile network coverage (as a percentage of the total population) is about 90 per cent for 2G/3G and 35 per cent for 4G. The fixed-line network coverage (as a percentage of the total

population) for Tongatapu is 97 per cent, Ha'apai (92 per cent), Vava'u (65 per cent), Niuafo'ou (85 per cent) and none in Niuatoputapu. Active subscribers (as a percentage of the total population) is 35 per cent for mobile Internet and 5 per cent for fixed-line Internet. Mr. Tu'itavake highlighted that the challenges encountered by TCC include, the lack of affordability of ICT devices and difficulties in securing vendor licences in a timely manner. He further noted that deploying infrastructure to fulfil universal service obligation requirements, deploying a resilient infrastructure due to high costs, limited power supply in remote areas and growing cyberthreats continue to hamper the operator's ability to deliver efficient Internet services. As a way forward for reducing the cost of ICTs, he suggested the use of IXPs, data centres, cloud databases, value-added services, bundling Internet packages, caching and hosting servers.

15. Mr. Navitali Taka, Head of IP Network and Transport, Telecom Fiji Limited, informed that Telecom Fiji Limited provides fixed-broadband services for Fiji. Furthermore, Telecom Fiji Limited supports 85 per cent of Fiji government's ICT connection with remote areas and rural schools via satellite. Telecom Fiji Limited also provides IXP peering and backhaul connectivity for mobile-broadband operators in the country. Mr. Taka noted that the demand for Internet bandwidth has grown significantly in the last decade. He stated that the majority of subscribers of Telecom Fiji Limited (41.9 per cent) use Internet connectivity for streaming video applications. This is followed by web applications (22.7 per cent) and file transfers (18.3 per cent). Mr. Taka highlighted that the challenges encountered by Telecom Fiji Limited include, maintaining consistent network connectivity, enhancing network capacity to meet increasing demand, addressing cyberthreats, building network resilience to natural disasters, updating the technical skills of staff, and filtering illegal and inappropriate content.

16. Mr. Aftab Siddiqui, Technical Engagement Manager from ISOC shared the project IXP project of ISOC (www.ixpmap.org) with the audience highlighting that the purpose of this project was to mark all the existing IXPs in the Asia-Pacific region and where do we need IXPs. The IXP project is one of ISOC's activities in support of the Asia-Pacific Information Superhighway initiative implementation. Mr. John Jack from Vanuatu raised a concern that due to lack of traffic in Pacific island nations it is impossible for IX operators in the Pacific to bring content providers like Facebook, Google among others. He suggested that all Pacific IXPs should be interconnected and share the benefits. Mr. Siddiqui proposed to conduct a study to find out if interconnecting IXPs in the Pacific region is feasible. He also proposed that content providers such as Facebook and Google should put their caches as part of their corporate social responsibilities rather than a commercial decision to circumvent their strict requirements of minimum bandwidth.

17. Following the presentations, the representative of Vanuatu highlighted the importance of establishing an IXP for efficient network traffic management, and requested ESCAP and other implementing partners to explore the feasibility of a

subregional IXP to be hosted by USP, in order to increase efficiency and reduce costs.

Session 5: ICT infrastructure resilience to natural disasters

18. Mr. Nuwan Waidyanatha, Senior Research Fellow, LIRNEasia, presented the findings from experiences of building ICT infrastructure resilience in India, Maldives, Myanmar, Nepal and Vanuatu. In these disaster prone countries, the ICT infrastructure is highly vulnerable to damages from various hazards. Yet, a resilient ICT infrastructure is critical for emergency communication, and a formal team to coordinate the use of ICT in disaster and emergency communication is needed. Mr. Waidyanatha, therefore, suggested several tools for strengthening ICT infrastructure resilience. For example, geographic information system (GIS) mapping of hazards and the vulnerability of various infrastructures to these hazards can be used to inform disaster risk management and planning. In addition, communities and organizations can assess disaster risks and ensure continuity of communications using software and tools such as the RASTER risk assessment and the stepwise refinement method. He also suggested that an inventory of best practices for developing community networks can provide useful lessons for Asia-Pacific countries.

19. Following the presentation, participants affirmed the need to promote sharing of best practices among Pacific island countries on ICT infrastructure resilience to recent natural disasters.

Session 6: e-Resilience survivability and availability exercise – The RASTER methodology

20. Mr. Nuwan Waidyanatha, Senior Research Fellow, LIRNEasia, pointed out that in the past, a telecommunication outage was merely an inconvenience; but today, an outage would stall businesses and production. He noted that the unavailability of telecom services during natural disasters is often due to component and network failure. He introduced the RASTER methodology that can help organizations strengthen their resilience to natural disasters by understanding what can go wrong with each telecom service they use. The RASTER methodology facilitates the uncovering of "black swans" (i.e., risks with low probability and high impact or effects), and preparation of recommendations using a tested methodical analysis based on the technical aspects of failure of telecom services. It also considers the societal impact of failure and risk perceptions of external stakeholders.

21. Mr. Nuwan Waidyanatha explained the types of projects that have utilized the RASTER methodology. They include both commercial and non-commercial projects, as well as projects across a wide range of sectors and industries including,

health care, public administration, fire and emergency service, water management and flood protection, aviation, and the energy sector. The lessons from these projects reveal some valuable insights. For instance, technical organizations are generally better equipped to assess telecommunication risks, while health care organizations require more support. Another lesson shows that "old" technologies are not necessarily riskier, as long as there are ongoing training, maintenance and availability of spare parts. Risk assessment is critical for resilience and can be done by any organization, using the knowledge of existing employees. Mr. Waidyanatha proceeded to focus on the evaluation of risk of failure in the telecommunication sector using the RASTER methodology, and participants were requested to discuss in small groups.

22. Following the presentation and groups discussions, participants recognized the usefulness of the RASTER methodology for conducting risk assessment in the different organizations to strengthen their ICT infrastructure resilience. Participants, however, acknowledged that more time for group discussion could have been allocated to facilitate fruitful discussions on the exercise scenarios.

Session 7: Affordable broadband for all

23. Mr. Siaosi Sovaleni, Member of Parliament, Tonga, delivered his presentation on affordable broadband by noting the continued progress in connectivity and the use of ICTs, particularly the increasingly pervasive mobile-cellular network that is now the dominant channel for basic telecom services. Mr. Sovaleni, however, noted the substantial digital divides between countries and regions, and between developed and developing countries, particularly least developed countries. Mr. Sovaleni stated that ICT connectivity in the Pacific follows the global trend, but needs robust competition and the establishment of an independent regulator to monitor public and private investments in the telecommunication sector. Mr. Sovaleni recognized that there are many challenges hampering affordable broadband in the Pacific. They include, poor domestic connectivity, lack of competition, lack of an independent regulator, growing cyberthreats, outdated telecommunication legislations, lack of digital literacy, high cost of access to devices and data, limited electricity coverage in rural areas, vulnerability to natural disasters, and lack of leadership in the telecommunication sector. As a way forward, Mr. Sovaleni emphasized the importance of monitoring the status of ICT connectivity in the country and analysing ICT indicators, including statistics from census and other surveys. In addition, he stressed the need to raise policymakers and legislators' awareness on the development of ICT in order to facilitate an enabling policy and legislative environment for the telecommunication sector to grow.

24. Mr. John Jack, Deputy Chief Information Officer, Prime Minister's Office, Vanuatu, outlined key milestones of ICT development in Vanuatu. It includes the establishment of the Telecommunications Regulator in 2006; adoption of the

Telecommunications Policy in 2007; establishment of the Office of the Government Chief Information Officer and an IXP in 2012; development of a Mobile Government Strategy, a National Broadband Strategy, a National Child Online Protection Programme and a Consumer Champion Programme in 2015; establishment of the emergency cluster in 2016; and strengthening of the national domain name administration, establishment and launch of Vanuatu's Computer Emergency Response Team, and launch of the Vanuatu Internet Governance Forum in 2018. Mr. Jack noted that as a result of these national efforts, access, use and revenue from broadband connectivity (mobile- and fixed-broadband subscriptions) have increased significantly. However, he indicated that challenges remain for the development of ICT in Vanuatu. They include, retention of professional skilled workforce, relocation of communities in certain islands due to natural disasters, availability of reliable electricity in the rural areas, high cost of ICT infrastructure deployment (including transportation, logistics and maintenance) in remote and isolated islands, increase of fake news and online threats/cyberattacks, and establishment of an effective governance structure for the submarine cable infrastructure. As a way forward, Mr. Jack suggested the review of current policies to ensure their relevance to the ongoing changes in technology. He also suggested the development of a national digital governance roadmap, as well as key ICT policies for infrastructure sharing, and for the universal access and service fund. In addition, the alignment of ICT policies to national development strategy and the enactment of a cybercrime bill will be critical to improving broadband access and use.

25. Mr. Ioane Koroivuki, Regional Director, Asia and the Pacific Telecommunication Development Bureau, ITU, highlighted that international connectivity to the Pacific islands has improved significantly over the last decade with submarine fibre-optic cables connected to most Pacific island countries. He further added that inter-island national submarine connectivity in the Pacific has also improved significantly. As a result, wholesale demand for international Internet bandwidth has increased and price has dropped significantly. Mr. Koroivuki shared the case of Tonga, as documented in a Hibbard Consulting report. He noted that prior to the commissioning of the submarine cable in 2013, the wholesale price of international Internet bandwidth was around USD 3,800 per Mbit/s per month and total international bandwidth purchases were just 65 Mbit/s. By May 2016, the average price was drastically reduced to around USD 250 per Mbit/s per month and total bandwidth increased to 710 Mbit/s. Later, regulatory intervention further lowered average price to around USD 150 per Mbit/s per month, and by July 2017, total bandwidth was 1,000 Mbit/s. Mr. Koroivuki stated that access obligations and regulations for submarine cables in the Pacific vary significantly. While most Pacific island countries have some form of general open access obligation, he noted that Fiji, Marshall Islands, New Caledonia and Vanuatu do not have general open access obligation (either as law, under licence or regulation). Moreover, only a few countries have specific regulations for access pricing, such as Fiji, French Polynesia, New Caledonia, Samoa and Tonga.

26. Mr. Ioane Koroivuki indicated that the challenges for submarine cable deployment in the Pacific island countries include, lengthy cross-border submarine cables that are costly to construct and maintain, small markets that make it difficult to cover operating expenses, low utilization that keeps unit costs and pricing high, and difficulties in sourcing and retaining skilled labour. In light of the challenges, Mr. Koroivuki recommended the following:

    a. Pacific island governments to leverage development funds from development partners to strategically achieve long-term broadband-enabled socioeconomic development;

    b. Pacific island governments to cooperate as a region to construct and operate point-to-point cable links, which can increase market size, foster the development of additional hubs, share the burden of repair contingency costs, promote greater integration, and better utilize the limited skills and capital available in the region;

    c. Pacific island governments to explore future connection opportunities that may be offered by new larger trans-Pacific cable companies during the planning stage. This may be cost-effective in the long term and increase redundancy;

    d. Pacific island governments to review their existing telecommunication regulatory framework in anticipation of submarine cable landings. Key areas for attention include, licensing and access regulation (including price regulation). Considerations need to be given to whether a new type or special category of licence is necessary to fit the circumstances of the landing station operator. Fixed licence periods, where they exist, need to be longer than 15 years and ideally matched to the design life of the cable to enable the licencee to continue selling (or at least offer) long-term service during the term of the licence; and

    e. In addition to telecommunication licence for landing station operator, there may be a range of other licences and authorizations required to lay and land a submarine cable. For example, approval of the cable route and cable laying activity by a maritime authority; and authorizations to construct beach manholes, bury terrestrial cables, or construct and power landing stations on public or customary land. It is vital that these processes be simplified, or alternatively, a coordinating authority could be appointed.

27. Following the presentations, participants recognized the importance of reviewing current legislations and regulatory framework relating to the effective management of landing cable operators. Mr. Ioane Koroivuki, Regional Director, Asia and the Pacific Telecommunication Development Bureau, ITU, informed that ITU continues to provide advisory services on reviewing rules and regulations in licensing and access regulation in Pacific island countries.

Session 8: AP-IS subregional ICT plan for Pacific island countries

28. Mr. Sanjay Srivastava, Chief, Disaster Risk Reduction Section, ICT and Disaster Risk Reduction, ESCAP, began his presentation titled, "Building Disaster Resilience in the ICT Sector in Pacific SIDS", by informing that 8.8 per cent of annual GDP in the Pacific is estimated as needed infrastructure investment (adjusted for climate investment) for implementation of the SDGs by 2030. By sector, ICT accounts for 0.8 per cent of annual investment needed in the Pacific, with the energy and transport sectors accounting for 5.1 per cent and 2.9 per cent of annual investment needed, respectively. He explained that disaster risk maps have identified the vulnerability of the ICT infrastructure to tropical cyclones and earthquakes in many Pacific island countries. This was demonstrated in New Zealand in November 2016, when the terrestrial backbone fibre-optic cable connecting Kaikoura to the national network was severely damaged in many places by an earthquake. Mr. Srivastava further noted that reliance of some Pacific island countries on a single fibre-optic cable means there is limited Internet bandwidth capacity to cope with disruptions due to submarine cable damages. For instance, in July 2015, Typhoon Chan-hom in the Northern Mariana Islands broke the single submarine fibre-optic cable connecting the islands. As a result, all data transmissions suffered severe disruptions, including Internet communications, phone calls, text messages and banking transactions. For six days, Internet traffic only reached 5-10 per cent of usual levels, before an old microwave link was used as an interim solution, and it took two weeks for a full recovery. Another example is the impact of Cyclone Winston on Fiji in 2016 that damaged the telecommunication infrastructure and impeded disaster response.

29. Mr. Sanjay Srinivastava reminded participants that enhancing the resilience of critical ICT infrastructure requires three policy steps: (1) identify critical ICT infrastructure at risk; (2) identify interlinkages and interdependencies among critical sectors; and (3) put in place "hard" (built environment) and "soft" (land-use plan, building codes) resiliency. He further noted that accounting for and estimating socioeconomic risks from current and future natural disasters are crucial for strengthening the resilience of the ICT infrastructure.

30. Mr. Kiyoung Ko, Head, Asian and Pacific Training Centre for Information and Communication Technology for Development (APCICT), presented a summary of APCICT's capacity building initiatives. He informed that as ESCAP's regional institute, APCICT provides capacity building support to member States on leveraging ICT for sustainable development. APCICT's initiatives target various groups of stakeholders, including policymakers through the provision of the Academy of ICT Essentials for Government Leaders; women entrepreneurs through the Women ICT Frontier Initiative; and future leaders (students and young people) through the Primer Series on ICT for Development for Youth. Mr. Ko shared that APCICT has launched the Academy in 35 countries (152 countries

reached via distance learning) across Asia and the Pacific, with more than 35,000 participants benefiting from the Academy training. Mr. Ko informed that APCICT is developing capacity development trainings for the four pillars of the AP-IS. There will be training on network and information security and privacy, and Internet governance for the connectivity pillar; training on ICT for disaster risk management, and ICT and climate change for the e-resilience pillar; training on data-driven governance for the Internet and network traffic management pillar; and training on ICT for development policy, process and governance for the broadband for all pillar.

31. Following the presentations, Pacific island countries participants requested that ESCAP and AP-IS implementing partners continue to provide capacity development in the key areas of cybersecurity, infrastructure connectivity, Internet traffic and network management, e-resilience, and affordable broadband for all.

Session 9: Way forward

32. Mr. Siope Vakataki 'Ofa, Economics Affairs Officer, ESCAP, summarized the key priorities raised by Pacific member States as a basis for developing the Pacific subregional AP-IS plan (see Annex 1) as follows:

   a. Noting the PRISAP 2015-2020, emphasize the importance of subregional coordination and cooperation in the Pacific towards bridging the digital divide, leveraging synergies, sharing limited resources, avoiding duplication and enhancing the impact of interventions;

   b. In light of this successful joint workshop by ESCAP, ITU and PITA, continue to promote regular coordination and cooperation among national, subregional, regional and international organizations, and track progress of AP-IS activities in the Pacific by holding the AP-IS Pacific Subregional Meeting as a side event of the PITA AGM. This recommendation is supported by PITA;

   c. Continue to strengthen national legislations and regulatory policies for cybersecurity and e-government services in Pacific island countries;

   d. Develop a Pacific digital transformation strategy to advance broadband connectivity;

   e. Explore the feasibility of a subregional IXP to be hosted by USP, in order to increase efficiency in Internet traffic and network management;

   f. Promote the sharing of best practices among Pacific island countries on ICT infrastructure resilience to recent natural disasters;

g. Review the legislative and regulatory framework for licensing and access regulation in Pacific island countries, in anticipation of new landing submarine cables;

h. Recognize the importance of collecting and reporting national ICT statistics, and emphasize the need for closer cooperation and data sharing between ministries, regulators and the national statistics office at the national level; and

i. ESCAP and AP-IS implementing partners to continue to provide capacity development in the key areas of cybersecurity, infrastructure connectivity, Internet traffic and network management, e-resilience, and affordable broadband for all.

Session 10: ICT statistics for evidence-based policymaking

33. Mr. Christopher Ryan, Statistician, ESCAP Pacific Office, introduced the Every Policy is Connected (EPIC) tool that is supported by ESCAP for Pacific island countries. The tool helps to identify indicators that best track progress against key issues as addressed in national planning documents. He explained that EPIC is carried out in two stages. The first stage focuses on scrutinizing national and sector plans to identify all the key issues that require action. It also guides the review of indicators that track progress of the key issues. The second stage involves consulting regional and global initiatives with indicator frameworks, such as the SDGs, to assess whether the indicators in these frameworks can further assist with tracking progress of the key issues identified. He stated that the key objective is to have a one-stop shop for national statistic offices to provide useful guidance when conducting national surveys, as well as for line ministries to produce official statistics.

34. Mr. Christopher Ryan indicated that one of the objectives of the 10-Year Pacific Statistics Strategy is to, "produce the agreed core set of statistics across key sectors, economics, population, civil registration and vital statistics, education and health, as required by their national plans and agreed upon regional and international reporting frameworks, with timely analysis and dissemination of results to national users". However, he noted that one key challenge is the lack of clarity around the "agreed core set of statistics" for the Pacific and linkages to the National Minimum Development Indicators and the SDGs. Few Pacific island countries have clearly defined a core set of statistics, and there remain many data gaps in the Pacific National Minimum Development Indicators.

35. Mr. Christopher Ryan, proceeded to share the experience from Samoa and noted that 116 indicators have been adopted and linked to the Samoa Development Strategy. He informed that Samoan policies and plans appear to have very clear narratives, but not all key issues are addressed in the monitoring and evaluation frameworks of plans, and thus, do not have indicators to track their progress. He

further stated that Pacific island countries need a set of national sustainable development indicators that specifies key indicator requirements for the country by sector. This will guide the focus of national surveys and provide clarity on the types of information to collect. Moreover, it will assist in tracking progress and meeting regional and global reporting requirements. He advised that the set of national sustainable development indicators can have a two-tier indicator system, with tier 1 indicators providing an accurate picture of the development level of the country (and these indicators are normally required for regional and global reporting). Tier 2 indicators are all other indicators identified in the national development plan and various sector plans.

36. Following the presentation and group discussions, Pacific island countries participants recognized the importance of adopting appropriate statistical indicators that measure the national priorities of a country. Yet, participants raised concerns about the affordability of data collection for the adopted indicators.

Session 11: ICT indicators for the SDGs in Pacific island countries

37. Ms. Alison Culpin, Social Statistics Advisor (SDG), Pacific Community (SPC), informed that the ICT-related SDG indicators Pacific island countries have selected for monitoring and reporting include SDGs 4.a.1, 5.b.1, 9.c.1, 17.6.2 and 17.8.1. She noted that SDGs 1.4.1, 7.b.1, 8.10.2 and 17.7.1 are also related to ICT. She provided an update on the status of data collection for access to mobile phones and access to the Internet, and noted that the level of connectivity in the Pacific varies significantly.

38. Ms. Alison Culpin proceeded to explain the rationale for selecting each Pacific SDG and indicated relevant sources from national surveys that can be used to collect data for reporting. In the case of Pacific SDG indicator 5.b.1 – "Proportion of individuals who own a mobile telephone, by sex", she explained that mobile phone ownership is important for tracking gender equality since the mobile phone is a personal device that, if owned and not just shared, provides women with a degree of independence and autonomy. She stated that countries can collect data on this indicator through national household surveys. In the case of 9.c.1 – "Proportion of population covered by a mobile network, by technology", the percentage of the population covered by mobile-cellular network can be considered a minimum indicator for ICT access since it provides people with the possibility to subscribe to and use mobile-cellular services to communicate. ITU collects data for this indicator through an annual questionnaire to national regulatory authorities or ICT ministries, who collect the data from Internet service providers.

39. Following the presentation and group discussions, participants appreciated the work that has been done by national statistics offices in this area in collaboration with regional partners such as SPC.

Session 12: National surveys and ICT statistics

40. Ms. Alison Culpin, Social Statistics Advisor (SDG), SPC, shared the experience of collecting data (mini census) post-Cyclone Pam in Vanuatu in 2016. She noted that using 350 tablets to conduct 280 interviews in 55,527 households, provided very accurate and timely statistics for policymakers. She also informed that national statistics offices in Pacific island countries have established a schedule (2010-2022+) outlining the types of surveys planned for each country and each year. She explained that specific questions on communications are asked in typical household surveys that provide useful insights on access, affordability and expenditure.

41. Following the presentation and group discussion, participants highlighted the importance of accurate and official statistics for reporting of ICT progress in respective countries. The representative of Solomon Islands informed that the number presented for Solomon Islands on proportion of population covered by 4G mobile network (13.3 per cent) may not be accurate considering that in 2016, 4G technology was not launched yet in the country.

Session 13: ICT statistics – Insights from the population census data of Tonga

42. Mr. Siope Vakataki 'Ofa, Economics Affairs Officer, ESCAP, presented disaggregated ICT statistics extracted from the Tonga national census 2016. He informed that the population census survey questionnaire included a module on "communications and Internet". The module included questions on: (1) access to the Internet (fixed-broadband); (2) Internet access location; (3) access to mobile phones (with and without Internet); and (4) primary use of the Internet from mobile phones. With disaggregated information, useful insights were drawn on the number of Internet/mobile users by island group, sex, age and income group. Other access indicators were categorized by purpose of use, literacy level and Internet access location. He also shared the use of this statistics through an online GIS mapping platform (PopGIS 3.0) that is supported by SPC. Through this platform, spatial trends of access to ICT can be easily analysed using innovative maps.

43. Following the presentation, participants recognized the usefulness of analysing ICT statistics from national surveys. Participants also recognized the value of the online GIS mapping platform (PopGIS 3.0) in aiding evidence-based policymaking.

Session 14: Wrap up and evaluation

44. The representatives of ESCAP, ITU and PITA thanked participants for their valuable insights and active participation and closed the workshop. Participants were asked to complete the evaluation form.

Annex 1: Asia-Pacific Information Superhighway Steering Group Plan for the Pacific, 2019-2022.

Pacific Regional ICT Strategic Action Plan (PRISAP) 2015–2020[1] - Relevant **Themes** and *(Priorities)*	Asia-Pacific Information Superhighway Focus Areas	Outputs	Timeframe	Responsible Stakeholders
Theme 1. Leadership, governance, coordination and partnership *(1.1 Better coordination of regional and national initiatives in the Pacific; 1.2 Engagement of development partners and key stakeholders in ICT development, as early as possible; 1.3 Strengthening of partnerships and strategic engagement between regional and international organisations to reduce duplication of efforts, exploit synergies and utilise complementary activities).*	a) Noting the Pacific Regional ICT Strategic Action Plan 2015-2020, emphasized the importance of coordination of subregional cooperation and initiatives in the Pacific towards bridging the digital divide, to leverage synergies and avoiding duplication. In particular, the need for subregional cooperation initiatives in the Pacific to be rationalized by regional/international stakeholders working in this sector and consolidate into an annual basis as a side-event to PITA's annual AGMs;	Asia-Pacific Information Superhighway session during the next PITA AGM hosted, with the focus to discuss challenges and opportunities to ICT connectivity in the Pacific.	2019-2022	ESCAP, PITA, Pacific Islands Countries
Theme 1. Leadership, governance, coordination and partnership *(1.1 Better coordination of regional and national initiatives in the Pacific; 1.2 Engagement of development partners and key stakeholders in ICT development, as early as possible; 1.3 Strengthening of partnerships and strategic engagement between regional and international organisations to reduce duplication of efforts, exploit*	b) Pacific island countries participants recognized the need for ESCAP's sustainable interventions in the Pacific and working together with other regional/international organizations and requested that a follow-up meeting on AP-IS subregional meeting for the Pacific be undertaken in 2019. PITA supported this recommendation and requested that an AP-IS session for the Pacific be held during the next PITA Annual General Meeting in 2019;	Asia-Pacific Information Superhighway session during the next PITA AGM hosted, with the focus to discuss challenges and opportunities to ICT connectivity in the Pacific.	2019-2022	ESCAP, PITA, Pacific Islands Countries

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[1] https://www.itu.int/en/ITU-D/Regional-Presence/AsiaPacific/Pages/Events/2015/June-Pacific-Ministerial-Meeting/home.aspx

synergies and utilise complementary activities).				
Theme 1. Leadership, governance, coordination and partnership *(1.1 Better coordination of regional and national initiatives in the Pacific; 1.2 Engagement of development partners and key stakeholders in ICT development, as early as possible; 1.3 Strengthening of partnerships and strategic engagement between regional and international organisations to reduce duplication of efforts, exploit synergies and utilise complementary activities).*	c) Pacific island countries participants appreciated the coordination of the joint activity by ESCAP, ITU and PITA, in order to leverage synergies, share limited resources, avoid duplication and increase impact of intervention on the ground, and requested ESCAP to continue working together with other subregional/regional and international partners in the Pacific;	Asia-Pacific Information Superhighway session during the next PITA AGM hosted, with the focus to discuss challenges and opportunities to ICT connectivity in the Pacific.	2019-2022	ESCAP, PITA, Pacific Islands Countries
Theme 1. Leadership, governance, coordination and partnership *(1.1 Better coordination of regional and national initiatives in the Pacific)*	d) Promote sharing of best practices between Pacific island countries of ICT infrastructure resilience to recent natural disasters;	Asia-Pacific Information Superhighway session during the next PITA AGM hosted, with the focus to discuss challenges and opportunities to ICT connectivity in the Pacific.	2019-2022	ESCAP, PITA, Pacific Islands Countries
Theme 2. ICT policy, legislation and regulatory framework *(2.1.1 Encourage and support the development and adoption of national ICT policies)*	e) Review legislation and regulatory framework for licensing and access regulation in Pacific island countries, in anticipation of new landing submarine cables;	Policy advisory services	2019-2022	ITU, Pacific Island Countries
Theme 2. ICT policy, legislation and regulatory framework *(2.1 ICT policy, legislation and regulatory frameworks that provide a conducive and enabling environment for social and economic sustainable development)*	f) Develop a Pacific digital transformation strategy to advance broadband connectivity;	Study	2019-2022	USP, Pacific CROP ICT Taskforce

Theme 3. ICT infrastructure and Universal Access *(3.2 Ensure that ICT networks and support infrastructure are reliable, secure, fast and cost effective)*	g) Explore the feasibility of a subregional Internet exchange point (IXP) to be hosted by USP or another regional organization, in order to increase Internet traffic management;	Feasibility study	2019-2022	ISOC, ESCAP, ITU, USP, Pacific Island Countries
Theme 4. ICT human capacity building and Cybersecurity *(4.1 Develop a sustainable workforce with ICT skills; 4.2 Improve citizens basic ICT skills; and 4.3 Provide a more secure and safe ICT environment).*	h) Continue to strengthen national legislations and regulatory policies for Cybersecurity and e-government services in Pacific island countries; and	Policy advisory services and capacity building on cybersecurity/e-government services	2019-2022	ITU, ESCAP (APCICT), Pacific Island Countries
Theme 5. Financing, Monitoring and Evaluation *(5.1 Quality data and guidelines for better policy and effective monitoring and evaluation)*	i) Recognized the importance of collecting and reporting of national ICT statistics and emphasized the need for closer cooperation and data sharing between the Ministry, the Regulator, and the National Statistics office at the national level.	Line ministries consultation	2019-2022	Ministry of Communications, Regulators, National Statistics Bureaus, and other relevant domestic stakeholders

Annex 2: Agenda

Time	19 November 2018
08:30-09:00	*Registration*

09:00-09:30	**1. Opening**
	
	• Welcome remarks:
	   o Mr. Iosefa Maiava, Head, Pacific ESCAP Office
	   o Mr. Ioane Koroivuki, Regional Director, Asia and the Pacific Telecommunication Development Bureau, ITU
	   o Mr. Fred Christopher, Manager, PITA
	
	• Self-introduction by participants

09:30-09:45	*Group Photo and Coffee/Tea Break*
09:45-12:00	**2. Asia-Pacific Information Superhighway (AP-IS) initiative** Moderator: ESCAP This session focuses on the AP-IS initiative supported by ESCAP (update on progress and way forward). • Updated AP-IS Master Plan – Mr. Siope Vakataki 'Ofa, ESCAP • Pacific ICT Roadmap – Mr. Kisione Finau, University of the South Pacific
12:00-14:00	*Lunch Break* *Informal session for the Pacific private sector and governments to enhance partnerships.* • Efficient wireless technology – Professor Francois Gagnon, Chair of NSERC Ultra Electronics, Electrical Engineering Department, Canada (13:00-14:00)
14:00-15:15	**3. Infrastructure connectivity: Towards a more integrated market** Moderator: Mr. Ioane Koroivuki, Regional Director, Asia and the Pacific Telecommunication Development Bureau, ITU (Panel discussion) This session discusses the opportunities and challenges of promoting cross-border broadband connectivity in Pacific island countries. • Mr. Lealailepule Rimoni Aiafi, Associate (Vice) Minister of ICT, Samoa • Satellite communications in Pacific island countries – Mr. Kisione Finau, University of the South Pacific (Chair of CROP ICT Working Group) • Mr. George Samisoni, Chief Executive Officer, Fiji International Telecommunications Limited
15:15-15:30	*Coffee/Tea Break*
15:30-16:45	**4. Internet traffic and network management** Moderator: Mr. George Samisoni, Chief Executive Officer, Fiji International Telecommunications Limited (Panel discussion) This session focuses on measures for improving efficiency in Internet traffic and network management.

	• IXPs in Pacific island countries – Mr. Aftab Siddiqui, Internet Society • Mr. 'Iki Tu'itavake, Chief Technical Officer, Tonga Communications Corporation • Mr. Navitali Taka, Head of IP Network and Transport, Telecom Fiji Limited
16:45-17:00	**Wrap up** • ESCAP/ITU/PITA
20 November 2018	
09:00-10:15	**5. ICT infrastructure resilience to natural disasters** Moderator: LIRNEasia This session focuses on measures for enhancing the resilience of the ICT infrastructure to natural disaster, including experiences on the use of ICT for disaster risk management. • e-Resilience in support of emergency communication: Lessons learned on the need for contingencies – Mr. Nuwan Waidyanatha, LIRNEasia
10:15-10:30	*Coffee/Tea Break*
10:30-12:00	**6. e-Resilience exercise** Moderator: Mr. Nuwan Waidyanatha, LIRNEasia (Group exercise) This session introduces a software tool (RASTER) for assessing network vulnerabilities in Pacific island countries.
12:00-14:00	*Lunch Break* *Informal session for the Pacific private sector and governments to enhance partnerships.*
14:00-15:15	**7. Affordable broadband for all** Moderator: Mr. Lealailepule Rimoni Aiafi, Associate (Vice) Minister of ICT, Samoa (Panel discussion) This session discusses the opportunities and challenges of promoting affordable broadband access in Pacific island countries. • Mr. Siaosi Sovaleni, Member of Parliament, Tonga • Mr. John Jack, Deputy Chief Information Officer, Prime Minister's Office, Vanuatu • Mr. Ioane Koroivuki, Regional Director, Asia and the Pacific Telecommunication Development Bureau, ITU
15:15-15:30	*Coffee/Tea Break*
15:30-16:45	**8. AP-IS subregional ICT plan for Pacific island countries** Moderator: ESCAP • Building disaster resilience in the ICT sector in Pacific SIDS – Mr. Sanjay Srivastava, Chief, Disaster Risk Reduction Section, ICT and Disaster Risk Reduction Divison, ESCAP (remote) • Capacity training on ICT – Mr. Kiyoung Ko, Head, Asian and Pacific Training Centre for Information and Communication Technology for Development (remote)

	In this session, Pacific island countries' government representatives discuss key ICT priorities that need to be consolidated and reflected in the Pacific's AP-IS subregional implementation plan. • Summary of key ICT priorities – Mr. Siope Vakataki 'Ofa, ESCAP
16:45-17:00	**9. Way forward** ESCAP/ITU/PITA

<table>
<tr><td colspan="2">21 November 2018
Training Workshop #1: Collecting ICT statistics – Insights from national surveys (ESCAP)</td></tr>
<tr><td>09:00-10:30</td><td>10. ICT statistics for evidence-based policymaking
Speaker: Mr. Christopher Ryan, ESCAP</td></tr>
<tr><td>10:30-10:45</td><td>Coffee/Tea Break</td></tr>
<tr><td>10:45-12:00</td><td>11. ICT indicators for the SDGs in Pacific island countries
Speaker: Ms. Alison Culpin, SPC</td></tr>
<tr><td>12:00-13:30</td><td>Lunch Break</td></tr>
<tr><td>13:30-15:00</td><td>12. National surveys and ICT statistics
Speaker: Ms. Alison Culpin, SPC</td></tr>
<tr><td>15:00-15:15</td><td>Coffee/Tea Break</td></tr>
<tr><td>15:15-16:30</td><td>13. ICT statistics: Insights from the population census data of Tonga
Speaker: Mr. Siope Vakataki 'Ofa, ESCAP</td></tr>
<tr><td>16:30-16:45</td><td>14. Wrap up and evaluation
• Wrap up – ESCAP/ITU/PITA
• Evaluation – ESCAP</td></tr>
</table>

<table>
<tr><td colspan="2">22 November 2018
Training Workshop #2: ICT indicators and the IDI (national and global data collection) – ITU and PITA</td></tr>
<tr><td>09:00 - 09:45</td><td>1. Introduction
1.1 Introduction and objective of the workshop
1.2 Practical information for participants
    Speaker: ITU/PITA</td></tr>
<tr><td>09:45-10:15</td><td>Group Photo and Coffee/Tea Break</td></tr>
<tr><td>10:15-11:15</td><td>2. National ICT data collection and challenges in the Pacific
2.1 Purpose of ICT data collection, data collection schedule and data collected
2.2 Legal provisions for data collection and/or licensing conditions, and confidentiality measures
2.3 Data processing, dissemination and use of data
2.4 Challenges
    Speakers: Representatives from SIDS</td></tr>
<tr><td>11:15-12:30</td><td>3. Global ICT data collection: Overview of ITU's work on ICT statistics
3.1 Collection and validation of global administrative and household ICT statistics
3.2 Development of internationally comparable ICT indicators
3.3 Dissemination of ICT trends and analysis
    Speaker: Mr. Koay Hock Eng, ITU Expert on IDI Indicators</td></tr>
</table>

12:30-14:00	*Lunch Break*
14:00-15:00	**4. Fixed-telephone network, mobile-cellular network and international bandwidth indicators** 4.1 Fixed-telephone indicators 4.2 Mobile-cellular indicators 4.3 International bandwidth indicators 4.4 Discussion *Speaker: Mr. Koay Hock Eng, ITU Expert on IDI Indicators*
15:00 – 16:00	**5. Fixed-broadband, mobile-broadband and bundled telecom services indicators** 5.1 Fixed-broadband indicators 5.2 Mobile-broadband indicators 5.3 Bundled telecom services indicators 5.4 Discussion *Speaker: Mr. Koay Hock Eng, ITU Expert on IDI Indicators*
16:00 – 17:00	**6. Quality of service and traffic indicators** 6.1 Quality of service indicators 6.2 Traffic indicators 6.3 Discussion *Speaker: Mr. Koay Hock Eng, ITU Expert on IDI Indicators*
23 November 2018 **Global benchmarking**	
09:00-09:15	Interaction and discussion: Recap from day 1 *Speaker: ITU Consultant*
09:15 – 10:15	**7. Revenue, investment, employment and Pay TV** (Continuation of national and global data collection) 7.1 Revenue indicators 7.2 Investment indicators 7.3 Employment indicators 7.4 Pay TV indicators 7.5 Discussion *Speaker: Mr. Koay Hock Eng, ITU Expert on IDI Indicators*
10:15 – 10:30	*Coffee/Tea Break*
10:30 – 12:30	**8. Composite indices: A brief look around** 8.1 What they are 8.2 What they do 8.3 Good practices in composite index construction **9. The ICT Development Index (IDI)** 9.1 Conceptual framework and methodology 9.2 Subindices 9.3 Indicators used and their relevance and definitions 9.4 Setting national goals: IDI score or rank? **10. Reviewing the IDI** 10.1 Need for review of indicators 10.2 New indicators for the IDI and definitions

	Speaker: Mr. Koay Hock Eng, ITU Expert on IDI Indicators
12:30 – 14:00	*Lunch Break*

14:00 – 15:00	**11. IDI 2018: Pacific in focus**
	    11.1 What the IDI 2018 reveals and the road ahead
	        Speaker: tbc

15:00 – 16:00	**12. Hands-on session**
	    12.1 Quiz on indicators
	    12.2 Calculation of the IDI
	        Speaker: Consultant, Mr. Koay Hock Eng, ITU Expert on IDI Indicators

16:00-16:30	*Coffee/Tea Break*

16:30-17:00	**13. Vignette**
	    13.1 Sustainable Development Goals
	        Speaker: Mr. Koay Hock Eng, ITU Expert on IDI Indicators

17:00 – 17:30	**14. Closing and way forward**
	    14.1 Conclusions and way forward – *Mr. Koay Hock Eng, ITU Expert on IDI Indicators*
	    14.2 Closing remarks:
	      • Mr. Ioane Koroivuki, Regional Director, Asia and the Pacific Telecommunication Development Bureau, ITU
	      • PITA
	      • ESCAP

Annex 3: List of participants

MEMBERS

FIJI

Mr. Jone Waika Cagialau, Engineer Support Officer, Telecommunications Authority Fiji.

KIRIBATI

Ms. Renga Teannaki, Permanent Secretary, ICT Department, Ministry of Information, Communication, Transport and Tourism Development.

Ms. Kaboterenga Terry Romatoa, Technical Officer, Communications Commission Kiribati.

MARSHALL ISLANDS

Mr. Damian Jetnil, Spectrum Manager, Ministry of Transportation and Communications and Information Technology.

Mr. Ayapa Apuahe, Lead Engineer, National Telecommunications Authority.

MICRONESIA (Federated States of)

Mr. Paul James, Frequency Manager, Department of Transportation, Communication and Infrastructure.

PALAU

Mr. Jonathan Temol, Chief, Bureau of Communications, Ministry of Public Information, Infrastructure and Commerce.

PAPUA NEW GUINEA

Mr. David Bonjui, Economist, National Information and Communication Technology Authority.

SAMOA

Hon. Mr. Lealailepule Rimoni Aiafi, Vice Minister, Ministry of Communication and Information Technology.

Mr. Taimane Tony Sa'aga, Manager of ICT Secretariat / Secretary of Digital Transformation Council, Ministry of Communication and Information Technology.

SOLOMON ISLANDS

Mr. Wilson Sopanau Leguvaka, Director, Telecommunications Commission Solomon Islands.

TUVALU

Mr. Opetaia Simati, Director, ICT Department, Ministry of Communications and Transport.

TONGA

Mr. 'Anitelu Toimoana, Director of Information and Technology, Ministry of Meteorology, Energy, Information, Disaster Management, Climate Change and Communications.

VANUATU

Mr. John Jack, Deputy Chief Information Officer, Prime Minister's Office.

Mr. Rara Soro, Acting Director, Vanuatu Statistical Office.

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SPECIALIZED AGENCIES AND RELATED ORGANIZATIONS

International Telecommunication Union

Mr. Ioane Koroivuki, Regional Director, Bangkok, Thailand.

Mr. Koay Hock Eng, ITU Expert, Bangkok, Thailand.

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INTERGOVERNMENTAL ORGANIZATIONS

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OTHER INTERNATIONAL ORGANIZATIONS

Pacific Community (SPC)

Ms. Alison Culpin, Social Statistics Advisor (SDG), Statistics Division.

LIRNEasia

Mr. Nuwan Waidyanatha, Senior Research Fellow, LIRNEasia.

Internet Corporation for Assigned Names and Numbers (ICANN)

Mr. Savenaca Vocea, VP Stakeholder Engage Oceania, Australia.

Internet Society (ISOC)

Mr. Aftab Siddiqui, Technical Engagement Manager, Australia.

Pacific Islands Telecommunications Association (PITA)

Mr. Fred Christopher, Manager, Fiji.

Mr. 'Iki Tu'itavake, Chief Technical Officer, Tonga Communications Corporation, Tonga (Representative of the President, PITA)

Ms. Deborah Albert, Admin Assistant, Fiji.

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PRIVATE SECTOR ORGANIZATIONS

Fiji International Telecommunications Ltd.

Mr. George Samisoni, Chief Executive Officer, Fiji.

Telecom Fiji Ltd.

Mr. Navitali Taka, Head of IP Network and Transport, Fiji.

Ms. Radhika Karunaratne, Manager Analytics, Fiji.

Mr. Rahul Rolland Prasad, Team Leader Service Delivery, Fiji.

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EXPERTS

Mr. Siaosi Sovaleni, Member of Parliament, Parliament of Tonga, Tonga.

Mr. Kisione Finau, Director of Information Technology, University of the South Pacific, Fiji.

Professor Francois Gagnon, NSERC Ultra Electronics, Electrical Engineering Department, Canada.

<center>**************************************</center>

ESCAP SECRETARIAT

Mr. Iosefa Maiava	Head, ESCAP Pacific Office
Mr. Christopher Ryan	Statistician, ESCAP Pacific Office
Mr. Siope Vakataki 'Ofa	Economic Affairs Officer, ICT and Development Section, ICT and Disaster Risk Reduction Division
Mr. Jone Biudole Tikoicolo	Programme Assistant, ESCAP Pacific Office