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Regional capacity-building and overview of information and communications technology for development

Review of the progress made in implementing the outcomes of the World Summit on the Information Society in Asia and the Pacific

Note by the secretariat

Summary

For the last decade, the Asian and Pacific region has witnessed significant development in the area of information and communications technology. Particularly in recent years, mobile networks have expanded and the mobile telephone has solidified its position as the predominant means of voice communication in developing countries. Broadband network development has shown varied growth patterns according to subregion. The number of fixed telephone subscribers has either stagnated or decreased across the region, while the trend toward mobile and broadband use and development has accelerated.

In the present document, the secretariat reviews the emerging trends in information and communications technology and development throughout the region, the progress made towards meeting the targets set by the World Summit on the Information Society, and the contribution of mobile applications and broadband network development to accelerated socio-economic development. Based on the findings, the report concludes with recommendations for future action at the national and regional levels.

The Committee may wish to deliberate on the issue covered in the present document regarding the progress made on Summit targets in the region, and to provide the secretariat with guidance on its future strategic direction in this area, including potential focus areas that could be reflected in the programme of work for the biennium 2012-2013.

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I. Introduction

1. Since the first session of the Committee on Information and Communications Technology, held in November 2008, Asia and the Pacific has witnessed significant development in the area of information and communications technology (ICT). Mobile networks have continued to expand, and mobile telephones have solidified their position as the predominant means of voice communication in developing countries. At the same time, broadband network development has shown varied growth patterns according to subregion, as detailed below, while the number of fixed telephone subscribers has either stagnated or decreased across the region. These points highlight the accelerating shift towards mobile and broadband technologies throughout the region.

2. In the light of the recent economic crisis and the multiple challenges of addressing climate change, meeting internationally agreed development goals and sustaining economic growth, what do these trends in information and communications technology mean for ESCAP member countries?

3. In the area of information and communications and technology for development, the targets set by the World Summit on the Information Society are drawn from the guiding principles articulated in the Declaration of Principles, which are the basis for developing an inclusive and sustainable information society.¹ As socio-economic progress is measured against the Summit targets, ESCAP member countries should use these targets as a foundation for placing ICT into the framework of inclusive and sustainable socio-economic development.

4. Rapidly expanding mobile networks and broadband network capabilities offer unparalleled opportunities for the ESCAP member countries to accelerate the achievement of both the Summit targets and the Millennium Development Goals. An increasing number of people living in remote and rural areas can now be reached by mobile phone, while more information, services and applications can be carried on a growing number of mobile broadband networks throughout the region. The combined capabilities of applications and connectivity have the potential to significantly expand access to critical information, knowledge and services for previously under-served people, some of whom lack literacy skills, to improve their lives.

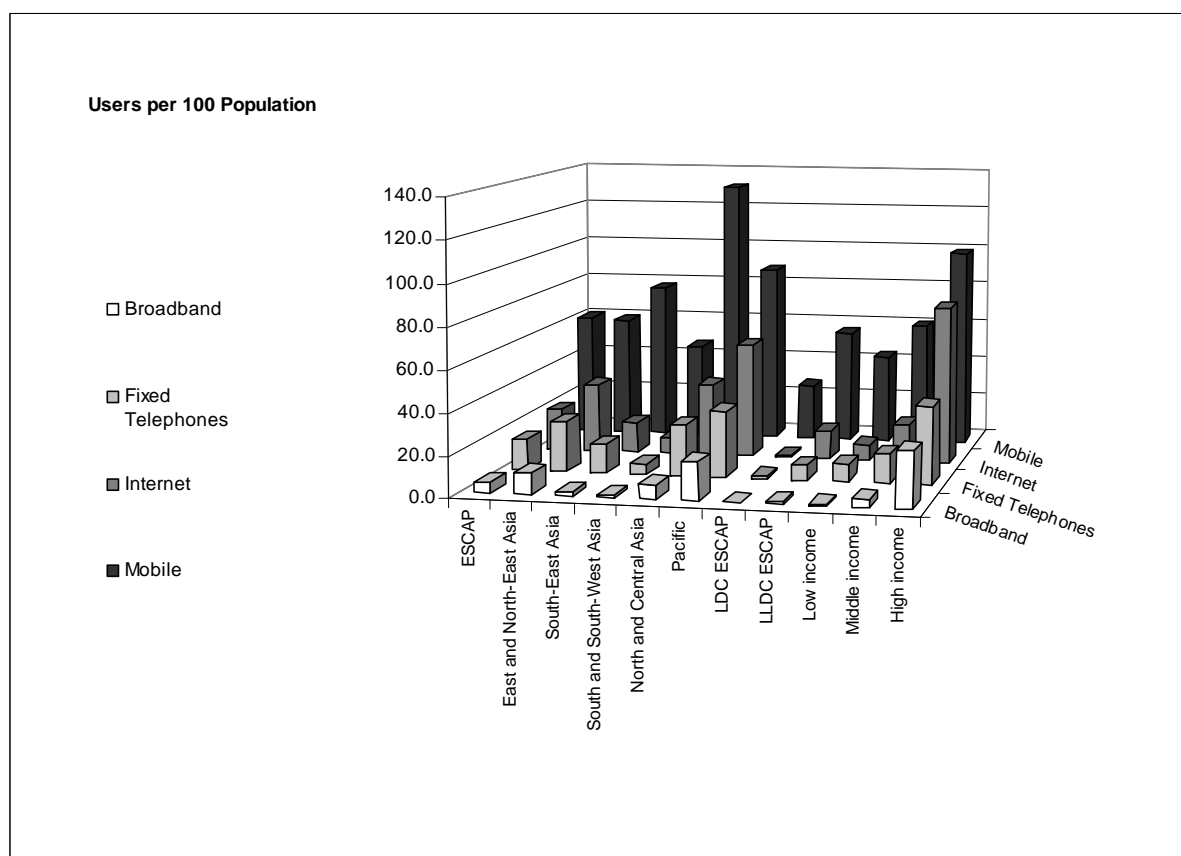
5. Against this background, the present document aims to review in detail the emerging trends in ICT development in the region, the progress made towards achieving the Summit targets, and the development of mobile applications and broadband networks, to review and assess what more could be done to accelerate socio-economic development. Based on the findings, the report concludes with a number of recommendations for future action at both the national and regional levels.

¹ See A/C.2/59/3, chap. I.

II. Regional overview: the current status of information and communications technology connectivity

6. According to the latest statistical figures on ICT compiled by the ESCAP secretariat, one of the noticeable developments in ICT for development since the last session of the Committee is the continuing proliferation of mobile telephony and the rapid growth of broadband networks in certain subregions. As the regional overview indicates (figure I), the predominance of mobile subscribers continues to characterize ICT development in Asia and the Pacific.

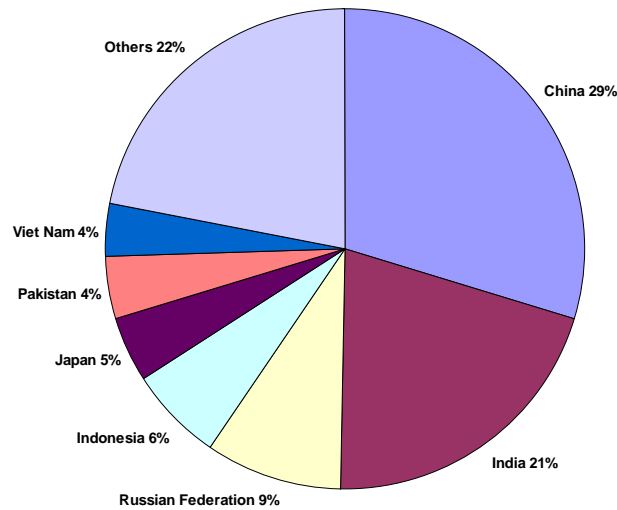
Figure I
Regional overview of information and communications technology access



Source: ESCAP, using data from International Telecommunication Union, ICT Statistics Database, 16 July 2010. Available from www.itu.int/ITU-D/icteye/Indicators/Indicators.aspx; and United Nations, *World Population Prospects: The 2008 Revision*, Population Database, 28 April 2009. Available from <http://esa.un.org/unpp/>.

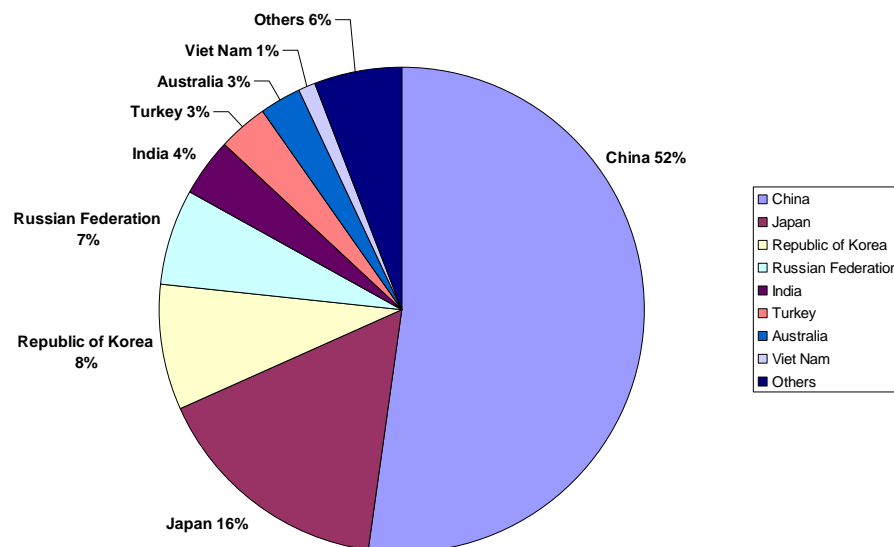
7. Over the same period, the share of mobile and broadband Internet subscribers in Asia and the Pacific as a proportion of the total number of subscribers worldwide increased to 54 per cent and 42 per cent, respectively. For mobile service subscriptions in the region in 2009, China and India were the leaders, with a combined 50 per cent share of subscribers, while China and Japan led for broadband subscriptions, with 52 per cent and 16 per cent of subscriptions, respectively (see figures II and III).

Figure II
Mobile subscribers by country as a percentage of total subscribers in Asia and the Pacific, 2009



Source: ESCAP, using data from International Telecommunication Union, ICT Statistics Database, 16 July 2010. Available from www.itu.int/ITU-D/icteye/Indicators/Indicators.aspx; and United Nations, *World Population Prospects: The 2008 Revision*, Population Database, 28 April 2009. Available from <http://esa.un.org/unpp/>.

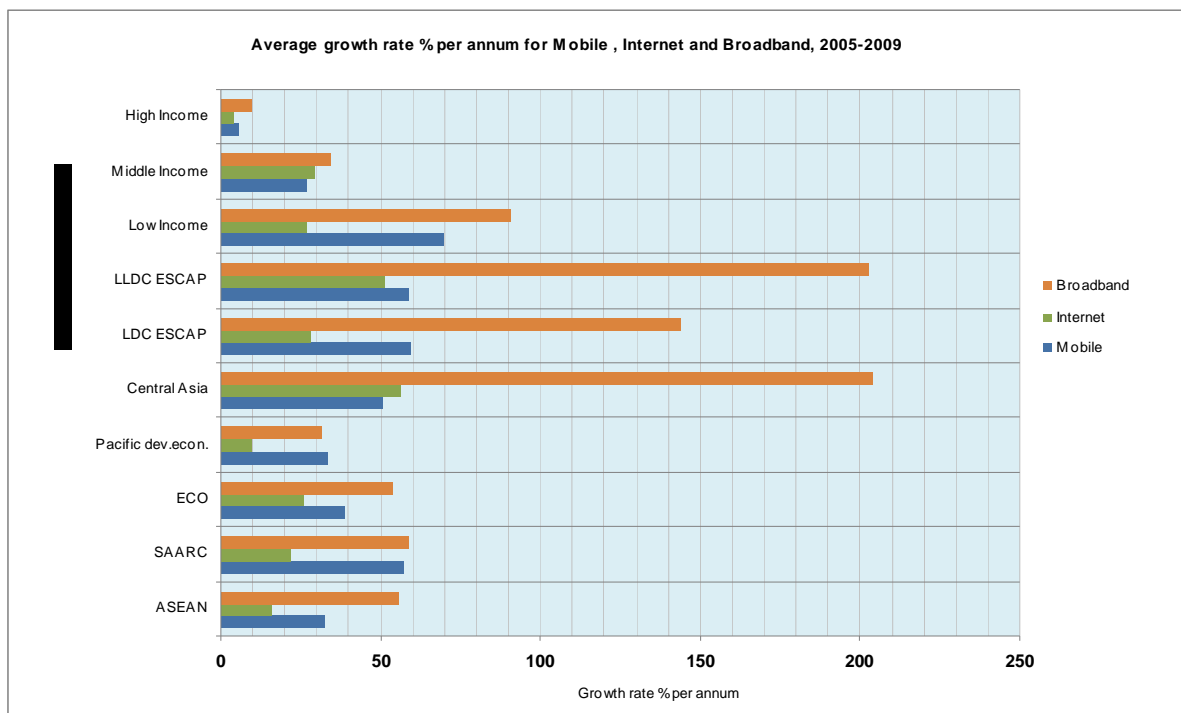
Figure III
Broadband subscribers by country as a percentage of total subscribers in Asia and the Pacific, 2009



Source: ESCAP, using data from International Telecommunication Union, ICT Statistics Database, 16 July 2010. Available from www.itu.int/ITU-D/icteye/Indicators/Indicators.aspx; and United Nations, *World Population Prospects: The 2008 Revision*, Population Database, 28 April 2009. Available from <http://esa.un.org/unpp/>.

8. The growth patterns observed demonstrate distinctive features, as illustrated in figure IV. Among various means of access, broadband subscriptions in Central Asia and in landlocked developing countries showed by far the highest growth rates. High-income countries showed slow growth rates for mobile, Internet and broadband subscriptions, demonstrating the saturation of high-income markets, while Pacific developing economies continued to show slow growth patterns, as well.

Figure IV
Growth rate by subregional and income groups, 2009



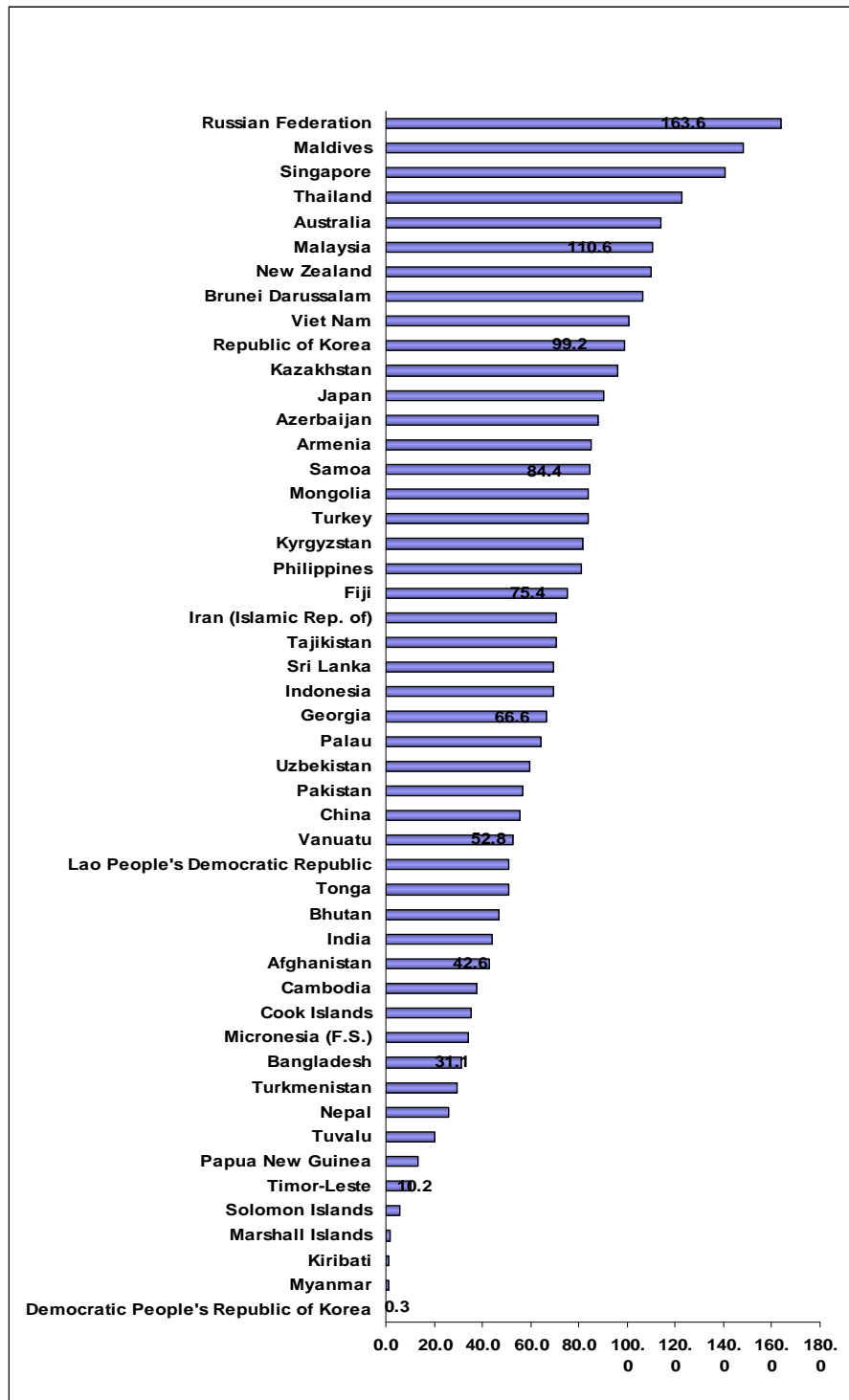
Source: ESCAP, using data from International Telecommunication Union, ICT Statistics Database, 16 July 2010. Available from www.itu.int/ITU-D/icteye/Indicators/Indicators.aspx; and United Nations, *World Population Prospects: The 2008 Revision*, Population Database, 28 April 2009. Available from <http://esa.un.org/unpp/>.

9. When the ESCAP region is examined by country, significant differences can be seen. Figure V shows the number of mobile subscribers per 100 population in 2009 by country.² The Russian Federation and the Maldives registered the highest numbers, while the majority of countries surpassed the threshold of 50 subscribers per 100 population, although a number of Pacific countries still lagged behind.

10. The number of Internet subscribers per 100 population in 2009 showed an interesting pattern, as illustrated in figure VI, with a small number of high-income countries having Internet penetration rates of over 70 subscribers per 100 population. This was followed by a second group with between 60 and 30 subscribers per 100 population. According to the figures, over half of the countries have less than 30 subscribers per 100 population, and 22 countries are still below 10 subscribers per 100 population.

² The number includes pre-paid card holders and multiple SIM card holders.

Figure V
Mobile subscribers per 100 population, 2009



Source: ESCAP, using data from International Telecommunication Union, ICT Statistics Database, 16 July 2010. Available from www.itu.int/ITU-D/icteye/Indicators/Indicators.aspx; and United Nations, *World Population Prospects: The 2008 Revision*, Population Database, 28 April 2009. Available from <http://esa.un.org/unpp/>.

11. Some economic theories have identified network effects, such as employment generation and the setting of a threshold for fixed telephone penetration, as a basis for generating multiplier effects.³ These theories indicate that, once infrastructure reaches a determined critical mass of users, the economic impact will be maximized and a significant increase in return on investment will be realized.

12. For instance, one study puts the critical mass threshold for mobile penetration, beyond which network effects are observed at 25 per cent,⁴ while another study places the equivalent threshold for broadband penetration at 20 per cent.⁵

13. If these threshold levels are applicable, it would mean that mobile networks have reached a critical mass of users in most of the ESCAP member countries and therefore could generate the desired multiplier effects. This is one of the reasons why the use of mobile phones for socio-economic development could be highlighted. In terms of the number of broadband Internet subscribers, figure VI shows that significantly fewer countries in the region satisfy the 20 per cent threshold. A distinctive dichotomy exists between the more advanced countries and other countries in terms of broadband Internet subscribers per 100 population, as illustrated in figure VII. Even if a 10 per cent threshold is applied, only five countries satisfy the threshold requirement to achieve network effects. However, the discussion would benefit from more economic research, as conditions surrounding mobile, Internet and broadband usage, as well as how they accrue benefits, may differentiate.

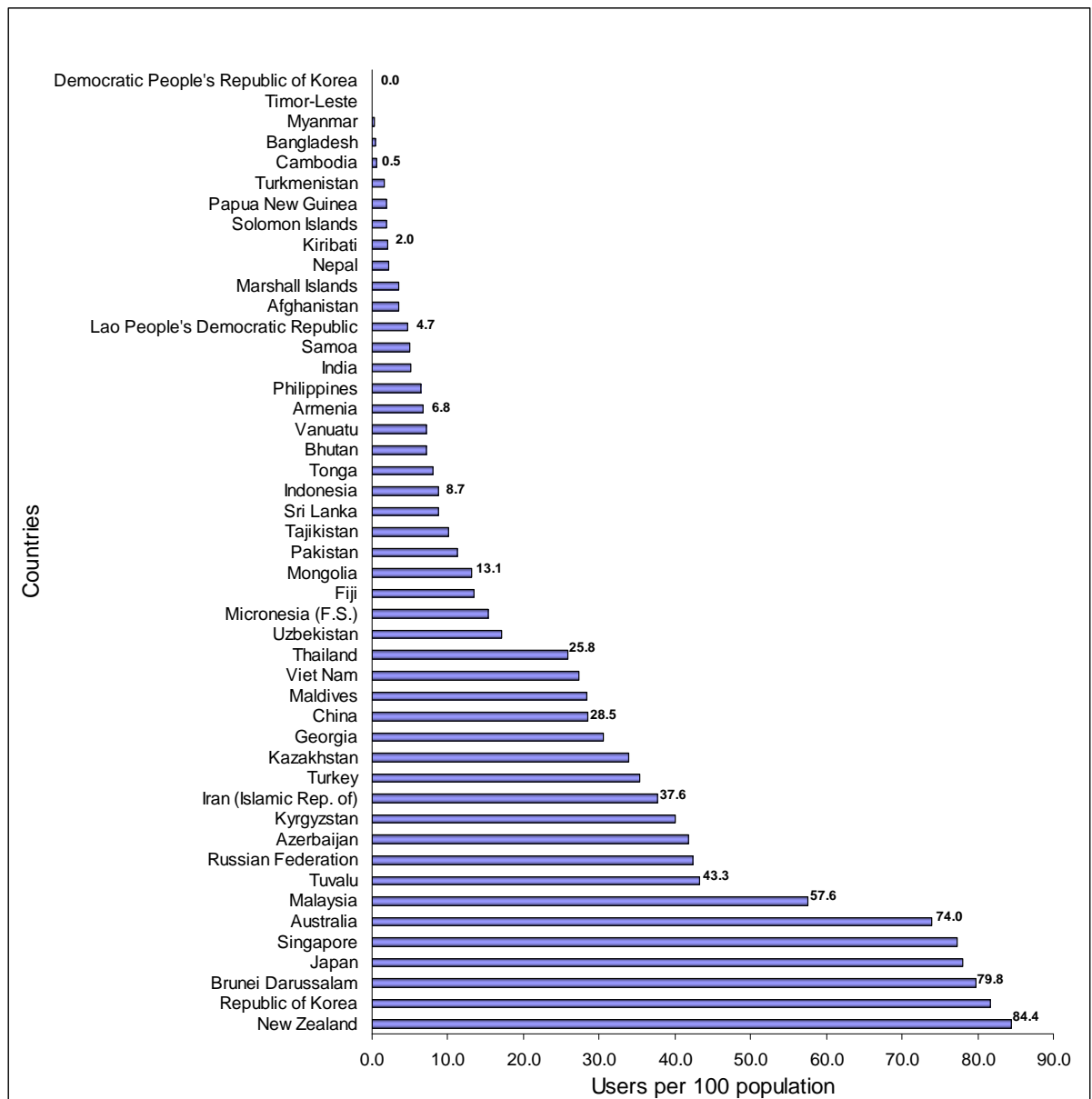
14. The last characteristic of recent ICT trends is the increased predominance of mobile phones as a share of total telephone lines in 2009, as illustrated in figure VIII.

³ Raul Katz and Stephan Suter, "Estimating the economic impact of the broadband stimulus plan" (2009). Available from www.elinoam.com/raulkatz/Dr_Raul_Katz_-_BB_Stimulus_Working_Paper.pdf; Raul Katz "Broadband stimulus and the economy" (Columbia Business School, 2009). Available from <http://unpan1.un.org/intradoc/groups/public/documents/gaid/unpan036759.pdf>.

⁴ Rajat Kathuria, Mashesh Uppal and, Mamta, "An econometric analysis on the impact of mobile", in *India: The Impact of Mobile Phones, Moving the Debate Forward: Policy Paper Series, No. 9* (Vodafone: Group Plc: January 2009), p.7. Available from www.vodafone.com/etc/medialib/public_policy_series.Par.56572.File.dat/public_policy_series_9.pdf.

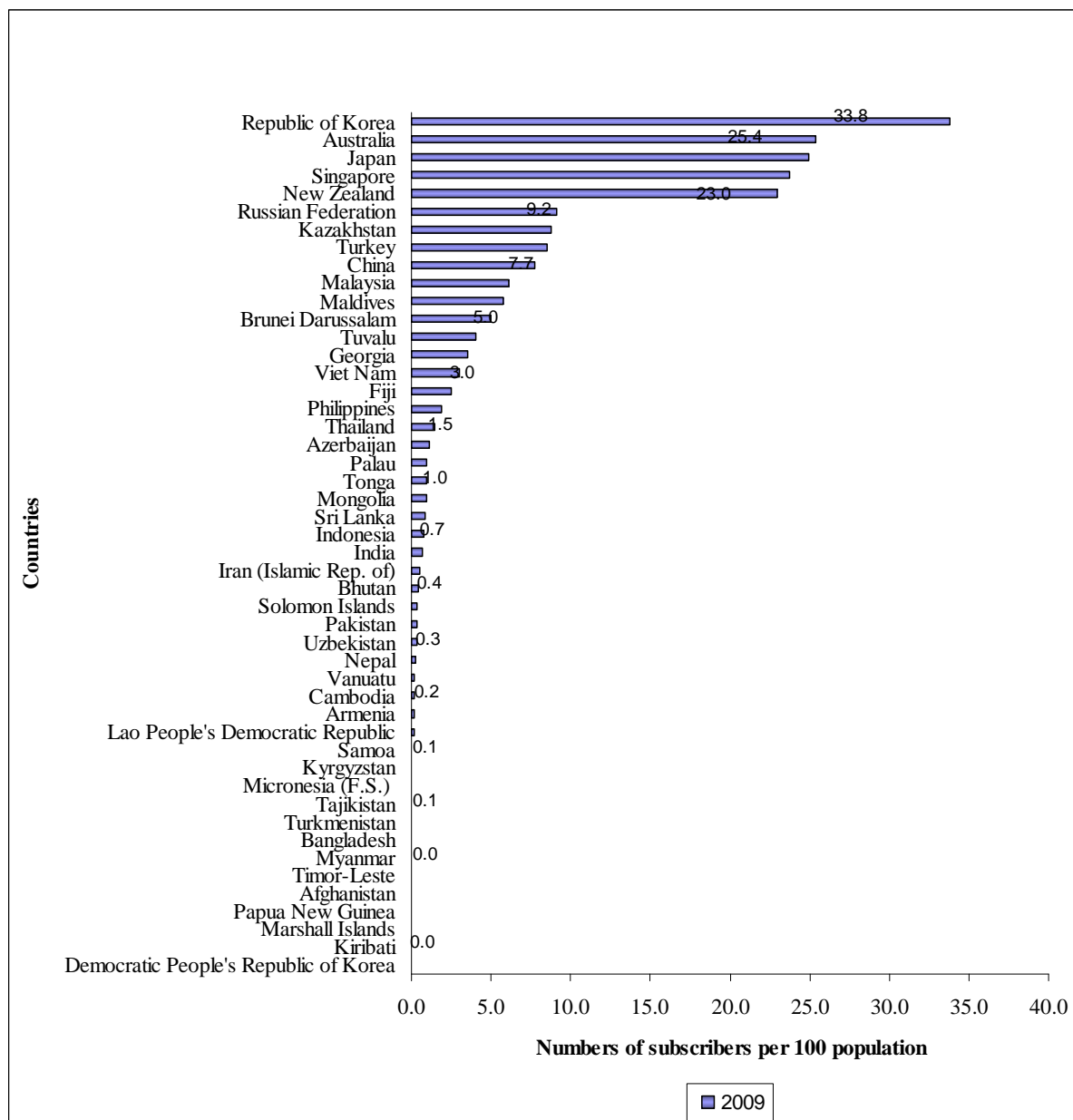
⁵ Pantelis Koutroumpis, "The economic impact of broadband on growth: a simultaneous approach". Available from www.canavents.com/its2008/abstracts/102.pdf.

Figure VI
Internet users per 100 population in 2009



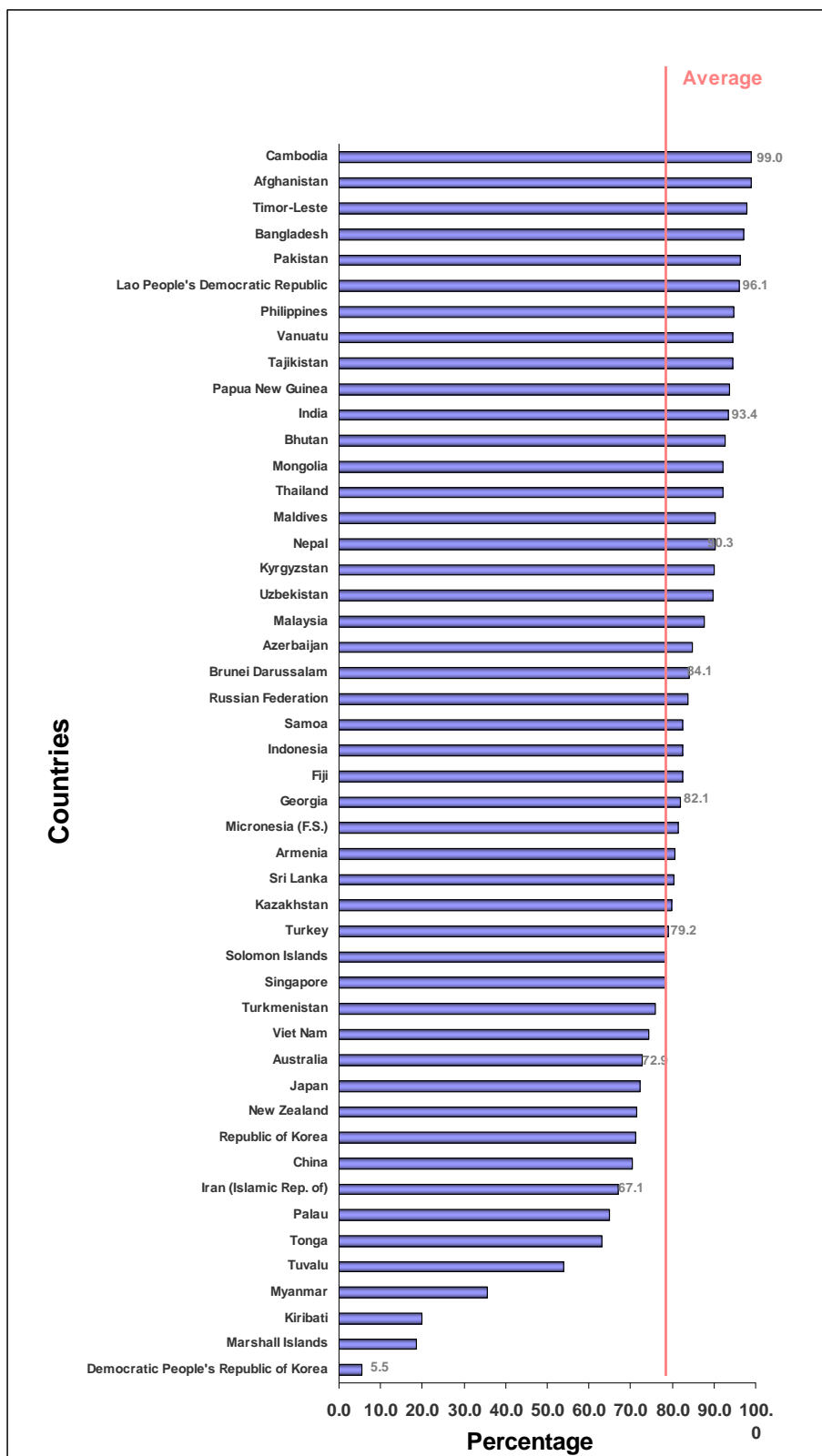
Source: ESCAP, using data from International Telecommunication Union, ICT Statistics Database, 16 July 2010. Available from www.itu.int/ITU-D/icteye/Indicators/Indicators.aspx; and United Nations, *World Population Prospects: The 2008 Revision*, Population Database, 28 April 2009. Available from <http://esa.un.org/unpp/>.

Figure VII
Broadband subscribers per 100 population in Asia and the Pacific, 2009



Source: ESCAP, using data from International Telecommunication Union, ICT Statistics Database, 16 July 2010. Available from www.itu.int/ITU-D/icteye/Indicators/Indicators.aspx; and United Nations, *World Population Prospects: The 2008 Revision*, Population Database, 28 April 2009. Available from <http://esa.un.org/unpp/>.

Figure VIII
Mobile cellular subscriptions as a share of total telephone lines, 2009



Source: ESCAP, using data from International Telecommunication Union, ICT Statistics Database, 16 July 2010. Available from www.itu.int/ITU-D/icteye/Indicators/Indicators.aspx; and United Nations, *World Population Prospects: The 2008 Revision*, Population Database, 28 April 2009. Available from <http://esa.un.org/unpp/>.

III. Achieving the goals of the World Summit on the Information Society in Asia and the Pacific

15. The use of ICT in the Asia-Pacific region is expanding. The internationally recognized targets established in 2003 at the World Summit on the Information Society can be utilized to measure the extent to which this expansion is bringing social and economic benefits to the people of the region. The General Assembly recognized ICT as a tool for development, and, accordingly, urged Member States, relevant United Nations bodies and other intergovernmental organizations, non-governmental organizations, civil society and the private sector to contribute actively to the implementation of the outcome of the Geneva phase of the Summit, including the Geneva Plan of Action, as well as to promote strategic partnerships among governments, donors, the private sector and civil society with the aim of enhancing collaboration for building an inclusive and development-oriented information society.⁶ It also encouraged the promotion of national, regional and international multi-stakeholder partnerships in this context.⁷

16. The Tunis Agenda of the World Summit on the Information Society (see A/60/687) established a follow-up mechanism at the international level, as recommended in the Geneva Plan of Action,⁸ (A/C.2/59/3, annex) and attached great importance to multi-stakeholder implementation at the international level, to be moderated or facilitated by United Nations agencies (see A/60/687, para 108). Additionally, the United Nations Group on the Information Society,⁹ co-chaired by the International Telecommunication Union, the United Nations Educational, Scientific and Cultural Organization, the United Nations Development Programme, and the United Nations Conference on Trade and Development, meets annually to coordinate implementation among United Nations agencies.

17. The Commission on Science and Technology for Development, a subsidiary body of the Economic and Social Council, also reviews progress made in the implementation of the outcomes of the World Summit on the Information Society and prepares an annual report (see E/2010/12) and ongoing assessment related to the Summit. Additionally, the Partnership on Measuring Information and Communication Technology for Development was established to improve the availability and quality of ICT data and indicators, particularly in developing countries, for the purpose of monitoring the development of the information society.

18. Overall, the Asia-Pacific region is making progress towards achieving the targets set by the Summit, and certain countries, in particular, are leading the world in the generation of local language content, e-government, and the penetration of mobile telephones. As of 2008, the region succeeded in achieving target 10 (“to ensure that more than half the world’s inhabitants have access to ICTs within their reach”), with subscriptions to mobile telephones per 100 population having reached 50

⁶ See General Assembly resolution 59/220, para. 6.

⁷ See General Assembly resolution 64/187, para. 9.

⁸ See A/60/687, para 83.

⁹ See www.ungis.org.

per cent.¹⁰ The discrepancies between countries in the region are striking, however, and the success of certain countries masks the lack of progress in others. The profile of the subscribers should also be analysed more carefully.

19. When compared to other regions worldwide, Asia and the Pacific falls short of the more than 80 per cent of subscriptions to mobile telephones reported in Europe, North America, and Latin America and the Caribbean. It also lags behind these regions in terms of Internet connectivity and broadband.¹¹

20. A more detailed review of the progress made in meeting the Summit targets in Asia and the Pacific follows.

Target 1

To connect villages with information and communications technologies and establish community access points

21. Mobile telecommunications have become increasingly important in recent years, particularly as a way to reach rural areas and previously unconnected people. The reach of mobile networks is enabling people to access voice and data services both through mobile telephones and through personal computers which connect to the Internet via these mobile networks.

22. A recent study published by the International Telecommunications Union, estimated that, in Asia and the Pacific, 76 per cent of the rural population (1,720 million people) is covered by a mobile cellular network signal. This figure is higher than in Africa and the Americas, but there are still more than 500 million people living in rural areas who are not covered by such a signal.¹² Mobile networks are increasingly being used in remote areas to connect to the Internet. This solution was used to connect community access points in a project implemented by ESCAP in collaboration with the Asian Development Bank and the Governments of Bangladesh, Bhutan, India and Nepal.¹³ Wired telecommunications were not available in the villages concerned and satellite connectivity was prohibitively expensive.

¹⁰ See ESCAP, *Statistical Yearbook for Asia and the Pacific 2009* (United Nations publication, Sales No.E.10.II.F.1), p. 132.

¹¹ Ibid.

¹² International Telecommunication Union, *World Telecommunication/ICT Development Report 2010, Monitoring the WSIS Targets: a Midterm mid-term review* (Geneva, Switzerland, 2010.), p. 14. Available from www.itu.int/dms_pub/itu-d/opb/ind/D-IND-WTDR-2010-PDF-E.pdf (accessed on 8 October 2010)p.14.

¹³ Project Overview, Empowering Rural Hyunjung Lee, Asian Development Bank, "Project overview: empowering rural areas through community e-centers (CeCs) under SASEC Program (BAN, BHU, IND, NEP)." presentation delivered on 29 October 2009 at a regional workshop in Delhi, India. Available from www.unescap.org/idd/events/2009_Delhi_WS/Presentations/ADB-Delhi-Project-Overview.ppt.

Target 2**To connect universities, colleges, secondary schools and primary schools with information and communications technologies**

23. Connecting educational institutions can improve teaching and learning by providing access to educational materials and tools, by supporting ICT-enabled distance education programmes, and by enhancing the administration of educational institutions. Radio, television and the Internet are effective for the delivery of educational content to far-reaching areas. In a 2008 survey conducted by UNESCO¹⁴ on the availability of equipment in primary schools, it was reported that less than half of the schools in India had a radio, while this figure was close to two thirds in the Philippines, more than 80 per cent in Sri Lanka, and above 95 per cent in Malaysia. The survey found that the rate of access to television sets in schools was about 20 per cent in India, about 50 per cent in the Philippines and Sri Lanka, and above 95 per cent in Malaysia. Unfortunately, data were not available for every member State. The survey also found that, in Sri Lanka, the Philippines and India, close to 80 per cent of the students in primary schools did not have access to computers, while in Malaysia, a computing infrastructure was available to more than half of the students.

Table. Information and communications technology in schools, 2009

Country	Per cent of schools with radio	Per cent of schools with TV	Per cent of schools with Internet	Per cent of schools with broadband	Learners to one computer
Australia	...	...	99	...	5
Bhutan	...	...	16	...	21
Brunei Darussalam	100	...	100	100	...
Japan	...	...	100	...	...
Republic of Korea	100	100	100	100	5
Malaysia	100	100	100	80	13
Nauru	...	...	0	0	19
Singapore	100	...	100	100	5
Thailand	72	100	100	100	25

Source: Adapted from International Telecommunication Union, *World Telecommunication/ICT Development Report 2010: Monitoring the WSIS Targets: a mid-term review* (Geneva, Switzerland, 2010), p. 45. Only countries with available data are listed in the table.

Note: The International Standard Classification of Education (ISCED) was designed by UNESCO in the early 1970's to serve "as an instrument suitable for assembling, compiling and presenting statistics of education both within individual countries and internationally". Level 1-3 covers the first stage of basic education to upper secondary education (see http://www.unesco.org/education/information/nfsunesco/doc/isced_1997.htm).

¹⁴ Yanhong Zhang, T. Neville Postlethwaite and Aletta Grisay, eds. *A View Inside Primary Schools, A World Education Indicators (WEI) Cross-National Study* (Montreal, Canada, UNESCO Institute for Statistics, 2008), pp. 45-46. Available from www.uis.unesco.org/template/pdf/wei/sps/Report.pdf.

Target 3**To connect scientific and research centres with information and communications technologies**

24. One way to estimate the progress made on this target is to look at the availability of network connectivity at institutions that are recognized by Governments as research institutions. Such institutions are often connected to each other through what is sometimes referred to as a national research and education network. Such networks provide Internet connectivity between research and education communities within a country. For example, in India, the Education and Research Network, the BIOGRID (a virtual private network of the Department of Biotechnology, Government of India) and GARUDA (a grid computing initiative)¹⁵ provide network connectivity to research institutions and government agencies. Nearly two thirds of the countries in the Asia-Pacific region have national research and education networks, which is a higher share than in the Americas, the Arab States or Africa. Based on available data, in the Republic of Korea and Singapore, 100 per cent of public scientific and research centres are equipped with Internet access, which corresponds to their high degree of Internet penetration for the entire population. However, in Bhutan, which is a least developed country with a much lower Internet penetration for the general population, 100 per cent of the research centres are connected,¹⁶ which may indicate that research centres are, in fact, a priority for Governments in the region.

Target 4**To connect public libraries, cultural centres, museums, post offices and archives with information and communications technologies**

25. Data compiled for 28 countries in Asia and the Pacific showed that, by 2007, in eight countries, more than 80 per cent of public libraries offered Internet access to users. By contrast, 11 countries were found to have Internet access in less than 20 per cent of their libraries, indicating the sharp contrast in access between countries in the region. Initiatives such as the Global Library Initiative, which has granted funds to libraries in countries such as Viet Nam, seek to promote the use of computers and the Internet in public libraries. In 1995, Singapore initiated the nation's Library 2000 plan, which resulted in the implementation of broadband and wireless Internet access for patrons at public libraries.¹⁷

26. Regarding Internet connections in cultural centres, insufficient data are available. However, the connectivity of museums can be estimated by verifying if a museum has developed an Internet website. An Internet search conducted by the secretariat at the time the present document was being drafted found that less than half of the least developed countries in the region had a website for their national museums.

¹⁵ See www.garudaindia.in.

¹⁶ International Telecommunication Union, *World Telecommunication/ICT Development Report 2010, Monitoring the WSIS Targets: a Midterm mid-term review* (Geneva, Switzerland, 2010), pp.49 and 52). Available from www.itu.int/dms_pub/itu-d/opb/ind/D-IND-WTDR-2010-PDF-E.pdf (accessed on 8 October 2010), p. 49.

¹⁷ *Ibid.*, p. 76.

27. In order to quantify the connectivity of post offices, researchers have sought to determine the number of post offices that offer Internet access to the public. Data are only available for a few countries and areas, including the Republic of Korea, with more than 60 per cent of post offices offering Internet access to the public, Bhutan, with more than 30 per cent, and the Russian Federation and Hong Kong, China, with more than 10 per cent.¹⁸

Target 5

To connect health centres and hospitals with information and communications technologies

28. ICT has great potential to have a positive impact on health systems.¹⁹ For instance, ICT can be used to maintain patient health records and to deliver health services remotely (tele-health, telemedicine and mobile health).²⁰ It can also complement the skills of health workers by assisting in making health decisions and gaining knowledge through distance learning programmes. Additionally, ICT is important for health centres and health practitioners in that it provides access to reference materials, assists in the collection and dissemination of health information, and facilitates the movement of information to and from the field. ICT also assists policy- and decision makers in formulating health policies and strategies.

29. Few statistics are available with which to measure the availability of ICT in health centres. However, one indication of the use of ICT for health research at health centres in the region can be inferred from the number of institutions subscribing to the Health InterNetwork Access to Research Initiative (HINARI) of the World Health Organization, which provides affordable access to online health-related journals. Data show that the South-East Asian subregion and the western Pacific area have the fewest institutions subscribing to this programme, when compared with other parts of the world.²¹

30. According to the ITU *World Telecommunication/ICT Development Report 2010*,²² Bhutan, Nauru, New Zealand, the Republic of Korea and Singapore reported that 100 per cent of their health institutions had access to the Internet, while Thailand reported 91 per cent access. However, these figures should be interpreted with care as the term “health institutions” can be interpreted in different ways by different survey respondents.

¹⁸ Ibid., p. 86.

¹⁹ ESCAP, “E-health in Asia and the Pacific: challenges and opportunities” (Bangkok, 2010), p.26. Accessed on 18 August 2010 from www.unescap.org/esid/hds/lastestadd/eHealthReport.pdf.

²⁰ Ibid., p. 13 and 15-16.

²¹ International Telecommunication Union, *World Telecommunication/ICT Development Report 2010: Monitoring the WSIS Targets: a Midterm mid-term review* (Geneva, Switzerland, 2010), p. 102. Available from www.itu.int/dms_pub/itu-d/opb/ind/D-IND-WTDR-2010-PDF-E.pdf (accessed on 8 October 2010)p. 102. The regions mentioned reflect WHO conventions. Source of data: HINARI programme.

²² Ibid., p. 106.

Target 6**To connect all local and central government departments and establish websites and e-mail addresses**

31. Connecting and providing communications tools to central and local governments is critical for effectively governing a nation. According to the United Nations *e-Government Survey 2010*, countries in Asia and the Pacific lag behind countries in Europe and the Americas in terms of the e-government development index, which combines the availability and quality of online government services (online service index), telecommunications infrastructure, and the capacity of the people to utilize ICT.²³ However, vast differences exist between countries in the Asia-Pacific region. Among 183 countries surveyed worldwide, the Republic of Korea ranks first, indicating an unmatched e-government sophistication, while six other countries from the region rank in the bottom 30.²⁴

32. Singapore, Bahrain, Japan, Malaysia and Kazakhstan follow the Republic of Korea in the e-government development index ranking, while at the subregional level, Eastern Asia leads, followed by Western Asia, South-East Asia, Central Asia, Oceania, and Southern Asia, in that order.²⁵ Six countries in Asia and the Pacific rank among the top 20 in the “online service index”, indicating strength in this domain. On the other hand, only two countries rank among the top 20 in the “telecommunications infrastructure index” and in the “human capital index”.²⁶

Target 7**To adapt all primary and secondary school curricula to meet the challenges of the information society, taking into account national circumstances**

33. Adapting primary and secondary school curricula to incorporate ICT requires ICT-qualified teachers and access to ICT. ICT can be used in education as a complementary tool that provides teachers with learning materials that can be delivered directly to students, with the teachers acting as facilitators. Data show that Governments are increasingly using ICT for this purpose. In Malaysia, the Republic of Korea and Singapore, it is reported that 100 per cent of schools use Internet-assisted instruction. Even in Bhutan, a least developed country, it is reported that close to 50 per cent of schools have computer-assisted instruction. Countries around the world use varying standards to consider a teacher to be qualified to teach basic computer skills. While some countries require a formal degree in an ICT-related field, others have certification courses. Reports show that teachers

²³ United Nations Department of Economic and Social Affairs, *United Nations E-Government Survey 2010: Leveraging E-Government at a Time of Financial and Economic Crisis* (United Nations publication, Sales No. 10.II.H.2P), p. 61. *Note:* This survey groups countries in an Asian region and an Oceania region; both these regions were grouped together for this statistic. Exact groupings can be seen in Annex A of the survey.

²⁴ *Ibid.*, pp. 114-115.

²⁵ *Ibid.*, p. 61.

²⁶ *Ibid.*, pp. 116, 118 and, 122.

with such qualifications are scarce; for instance in Malaysia, the Republic of Korea and Thailand, less than 5 per cent of teachers have qualifications.²⁷

Target 8

To ensure that all of the world's population have access to television and radio services

34. Estimates on the penetration of radio and television indicate that, by 2009, 75 per cent of households in the Asia-Pacific region had a television set.²⁸ Countries such as Bangladesh, Bhutan, Kiribati, the Lao People's Democratic Republic, Myanmar, Nepal, and Timor-Leste, however, had less than 50 per cent penetration.²⁹ With regard to radio penetration, the target has not been met in the least developed countries of the region, with the exception of Samoa, which reportedly had radios in close to 90 per cent of its households. Afghanistan, Bangladesh, Bhutan, Cambodia, Kiribati, the Lao People's Democratic Republic, Myanmar, Nepal, and Timor-Leste are all reported to have had no more than 65 per cent.³⁰

Target 9

To encourage the development of content and to put in place technical conditions in order to facilitate the presence and use of all world languages on the Internet

35. While close to 7,000 languages are known to be in use around the world, more than half of them are spoken by less than 10,000 people. English and Chinese are by far the most used languages on the Internet, with more than 750 million users combined, followed by Spanish, Japanese, French, Portuguese, German, Arabic, Russian, and Korean.³¹

36. In 2010, the Internet Corporation for Assigned Names and Numbers announced support for non-Latin language uniform resource locators (URLs), – commonly referred to as web-page addresses, such as www.un.org, in non-Latin languages, such as Arabic and Russian. These internationalized domain names provide a localized Internet presence for millions of people in their native language. The development of, and access to, URLs with the use of Cyrillic, Arabic, Chinese and Hangul alphabets is now possible, improving the usability of the Internet in regions where language has been a barrier.

37. New registrations of Internet addresses in each country (country code top-level domains or ccTLDs), such as “.cn” for China and “.in” for India, also provide a rough indication of the content generated in each language. In this respect, some ESCAP member States are leading globally in terms of new registrations. Between 2005 and 2009, countries from the

²⁷ ITU, *International Telecommunication Union, World Telecommunication/ICT Development Report 2010: Monitoring the WSIS Targets, a Midterm Review* (Geneva, 2010). Available from www.itu.int/dms_pub/itu-d/opb/ind/D-IND-WTDR-2010-PDF-E.pdf (accessed on 8 October 2010) p.144

²⁸ *Ibid.*, p. 159. *Note:* The Asia and the Pacific country grouping according to ITU differs from the ESCAP country grouping. ITU includes some Central Asian countries in the CIS region.

²⁹ *Ibid.*, p. 160.

³⁰ *Ibid.*

³¹ *Ibid.*, pp. 179, 180 and 182.

former Soviet Union (.su), China (.cn), Tajikistan (.tj), Viet Nam (.vn), the Russian Federation (.ru) and India (.in), topped the worldwide list for average annual growth in registrations. If growth is measured as a percentage of the population of any given country, however, no ESCAP member State is ranked among the top 20 countries for the same period.³²

Target 10

To ensure that more than half the world's inhabitants have access to information and communications technologies within their reach

38. This target does not specify which ICT should reach more than half the world's inhabitants. However since target 8, "to ensure that all of the world's population have access to television and radio services", makes specific mention of radio and television, it could be assumed that this target refers to more sophisticated technologies capable of transmitting and receiving voice and data, such as the Internet and telephones (fixed and mobile).

39. As mentioned above, the Asia-Pacific region has seen impressive growth in the number of subscriptions to mobile telephones, passing the 50 per cent mark in 2008. However, the region still lags behind Europe, Latin America and the Caribbean, and North America, which have subscription rates of more than 80 per cent.³³

40. In summary, significant progress has been made in the implementation of the Geneva Plan of Action. In particular, goals related to connectivity and access have been met in an increasing number of countries in the region, as mobile networks have proliferated widely in remote and rural areas of developing countries. Based on the above review, however, a number of challenges remain:

- (a) ICT capacity development, especially among policymakers and decision makers, as well as among teachers and students;
- (b) Development of applications and content;
- (c) More bandwidth, where mobile network networks exists, and further expansion of mobile and other networks for inclusive and universal access to information and knowledge;
- (d) Regional cooperation to share resources, knowledge, good practices and lessons learned.

41. ICT capacity-building and the significant efforts made by the Asian and Pacific Training Centre for Information and Communication Technology for Development (APCICT) are reported separately in document E/ESCAP/CICT2/1.

42. The following chapter will focus on the remaining challenges, and the opportunities that ESCAP member countries could harness in the coming years.

³² Ibid., p. 185.

³³ See ESCAP, *Statistical Yearbook for Asia and the Pacific 2009* (United Nations publication, Sales No.E.10.II.F.1), p. 132.

IV. Pacific connectivity

43. Pacific connectivity remains one of the major challenges in building an inclusive and sustainable information society in Asia and the Pacific. The Pacific island countries have been showing much slower growth than the rest of the region in expanding ICT access. According to the statistical figures (compiled by ESCAP and based on ITU data, as referenced above), despite the dynamic expansion in mobile communications in the rest of the region, the Pacific island developing economies had 24.2 mobile subscribers per 100 population in 2009, while the ESCAP average was 60.7 and the landlocked developing countries averaged 55.9. The slow pace of broadband uptake is also evident in the fact that most Pacific island developing economies had less than 1 subscriber per 100 population in 2009, with the exception of Tuvalu (4), Fiji (2.5), Tonga (1) and Palau (1).

44. Subregional organizations and bodies in the Pacific have been playing a critical role by assisting Pacific island developing economies in expanding ICT access and deepening its usage. For instance, the Pacific Islands Telecommunications Association and the Secretariat of the Pacific Community aim to assist member countries in improving, promoting, enhancing, facilitating and providing ICT services. In turn, this strengthens subregional and regional cooperation and integration through the coordination, implementation, and monitoring and evaluation of ICT strategies and initiatives. As a recent and concrete outcome of such efforts, ICT ministries from the Pacific countries adopted the Tonga Declaration³⁴ at the Pacific Regional Information and Communication Technology ministers' meeting in Nuku'alofa, in June 2010, recognizing that ICT has enormous potential for socio-economic development, and endorsed the Framework for Action on ICT for Development for the Pacific.³⁵

45. The ESCAP secretariat has taken the approach of supporting Pacific subregional organizations in their efforts to harmonize ICT policies and regulations through capacity-building and technical cooperation projects. For example, APCICT has been implementing its ICT for development capacity-building programme called the Academy of ICT Essentials for Government Leaders in five Pacific island States, namely the Cook Islands, Kiribati, Samoa, Tonga and Tuvalu, in cooperation with the Secretariat of the Pacific Community. Moreover, in October 2009, the secretariat organized the Subregional Workshop on Strengthening ICT Policies and Applications to achieve the Millennium Development Goals and the Summit targets in South-East Asia and the Pacific,³⁶ focusing on the specific needs of Pacific island countries. The Commission was informed during its sixty-sixth session, in May 2010, that the Pacific Island Forum

³⁴ Available from [www.spc.int/edd/images/stories/ictpapers/Tonga%20Declaration%20\(2\).pdf](http://www.spc.int/edd/images/stories/ictpapers/Tonga%20Declaration%20(2).pdf)

³⁵ See www.spc.int/en/component/content/article/216-about-spc-news/494-ministers-declare-to-move-ict-development-forward.html.

³⁶ See www.unescap.org/idd/events/2009_sRW-MDG-WSIS-SEAsia%20and%20Pacific/index.asp.

Leaders had requested a review of the Pacific Plan³⁷ Digital Strategy and an update of the ICT development framework for the Pacific subregion.³⁸

46. Given the special geographic situation of less populated, scattered islands and the specific socio-economic needs of the Pacific island developing economies, ESCAP and other multilateral and bilateral development agencies should focus on the need of these countries to facilitate connectivity. This includes uniform support and encouragement for mobile applications and broadband network development. At the same time, there is a need for a more holistic approach to Pacific connectivity. In addition to fixed and mobile broadband, the use of satellite communications and services should be fully deployed to extend ICT access to the islands that are not connected.

47. In this regard, the secretariat will further mobilize partners, such as the Japan Aerospace Exploration Agency and the Korea Communications Commission, to conduct technical cooperation projects in partnership with Pacific subregional organizations. In particular, the Wideband InterNetworking engineering test and Demonstration Satellite³⁹ of the Japan Aerospace Exploration Agency and the Chinese satellite constellation for environment and disaster monitoring (see E/ESCAP/CDR/2) provide a great opportunity for the Pacific island developing economies in the coming years.

V. Focus on mobile applications and broadband networks

48. As discussed in the preceding chapters, the Asian and Pacific region has experienced significant development and growth in connectivity. As the development of mobile networks is promoted by private sector initiatives, thus creating a better policy environment, the next step which ICT policy- and decision makers may wish to take is to consider is how best to take advantage of the newly acquired reach of mobile networks to the previously under-served people, thus fostering inclusive and sustainable socio-economic development through mobile applications. The development of a people-centred information society requires both expanding access and deepening usage. Now that mobile networks are expanding their reach, the policy focus could shift towards disseminating information and knowledge and delivering public services using these networks.

49. ESCAP has conducted research on several mobile applications, which may hold promise for promoting inclusive and sustainable socio-economic development among ESCAP member countries. One area of mobile applications which could be considered is m-finance, including m-payment, m-remittances and m-banking. An ESCAP forthcoming report entitled “Advancing financial inclusions with mobile phones: ICT for inclusive economic development” examines some of the advanced uses of mobile phones for financial services, especially among the poor in

³⁷ The *Pacific Plan for Strengthening Regional Cooperation and Integration* was endorsed by Leaders at the Pacific Islands Forum meeting in October 2005. It is available online at www.forumsec.org.fj.

³⁸ See *Official Records of the Economic and Social Council, 2010, Supplement No. 19* (E/2010/39-E/ESCAP/66/27), para. 109.

³⁹ See www.jaxa.jp/projects/sat/winds/index_e.html.

developing countries. This report finds mobile payment and remittance services to be much less expensive and more convenient for migrant workers and their families to transfer money. The possibility for people to access financial services, such as savings accounts, through their mobile telephones or through branchless banks operating through agents, has the potential of bringing inclusive finance to millions of unbanked people. Such deposit facilities give marginalized men and women avenues for financial preparation in facing emergencies brought about by economic changes, natural disasters, and other unexpected factors. In addition to the economic benefits of mobile applications, a wide range of applications for social development have started taking root. According to recent ESCAP publications, some of the Millennium Development Goals which are off track are health-related, such as reducing maternal mortality, infant mortality and malnutrition. For this reason, ESCAP is in the process of preparing several reports to promote ICT, in particular mobile phones, for accelerating the achievement of the Millennium Development Goals. In the area of health, the forthcoming ESCAP report entitled “Health in the digital age: reaching the poor with mobile phones” captures the dynamism and proliferation of the use of mobile phones in the health sector as well as how m-health applications could assist health practitioners in reaching the poor with health information and services.

50. The widespread use of mobile phones and applications for economic and social purposes is expected to further fuel the expansion of the subscriber base and the development of applications, services and content, which will in turn lead to the growth of the ICT private sector. Such growth will reduce the cost of hardware and devices and generate employment opportunities within the ICT sector as well as help create network effects.

51. The virtuous cycle and proliferation of applications and usage will then lead to a demand for more bandwidth, thus necessitating the development of broadband networks on a larger scale. Various reports and publications focus solely on the digital divide in the area of broadband access; however, it is important to stimulate discussion concerning what such broadband access can do to promote inclusive and sustainable socio-economic development. Furthermore, consistent technological roadmaps at the national and regional levels can be developed, including information on how such access could be linked to existing and planned networks, services, products and applications, be it mobile, Internet or fixed broadband.

52. The new and emerging technologies and opportunities also require a fundamental review of ICT policies and regulatory frameworks. The secretariat has been implementing a project on ICT access and policies funded by the Government of the Republic of Korea,⁴⁰ with a view to incorporating the emerging technological trends into the development plans of countries in the region. The outcomes of the project include the drafting of recommendations to update ICT policies, strategies and regulations to take advantage of the new capabilities as well as to raise awareness among policy- and decision makers of the new challenges and opportunities.⁴¹

⁴⁰ Available from www.unescap.org/idd/events/2009_sRW-MDG-WSIS-SEAsia%20and%20Pacific/index.asp.

⁴¹ See www.unescap.org/idd/events/2009_sRW-MDG-WSIS-Central%20and%20South%20Asia/2010-04-20_UN_ESCAP_Telecom_Seminar_Report.pdf.

53. Coupled with strengthened regional cooperation, the development of broadband networks would open up new opportunities in the context of cloud computing. Once access is robust and reliable and with country engagement, various socio-economic applications could be run in the cloud at the regional level. It could be a common education application to which countries agree to subscribe, or health applications which could be accessed across national boundaries. Regional cooperation and cloud computing could provide unparalleled opportunities in lowering costs and enhancing access to information and services, especially among least developed countries, landlocked developing countries and small island developing States.

VI. Recommendations

54. Against this background, the Committee may wish to consider the following recommendations as the way forward:

(a) Considering the growing mobile subscriber base in remote and rural areas, promote mobile applications which have a direct impact on the achievement of the Millennium Development Goals, such as m-payment and m-health, through national debates based on identified good practices and lessons learned;

(b) Align ICT policies and strategies to take advantage of mobile and broadband development, in particular by updating telecommunications regulations as recommended in the report cited in paragraph 52 above;⁴²

(c) Encourage the development of private sector companies which provide new and innovative applications for socio-economic development, based on good practices and lessons learned from the region;

(d) In view of the expected growth of mobile and other Internet applications and increased demand for bandwidth in the coming years, prioritize the development of broadband networks in ICT policies and strategies;

(e) Pacific connectivity should remain a priority in the region, given slow growth in mobile and broadband subscriptions in the Pacific, and Pacific subregional organizations should be strengthened in their coordination role;

(f) ICT ministries and agencies should strengthen their efforts to monitor the progress made towards achieving the Summit targets. Such monitoring should be based on the internationally agreed indicators promoted by the Partnership on Measuring ICT for Development;

(g) Regional cooperation should be further strengthened; in particular, subregional organizations such as the Special Programme for the Economies of Central Asia, should be supported in order to channel available technological and financial resources and expertise more effectively to less advanced countries.

⁴² Ibid., paras. 224 and 225.

Annex

Details about the sources of data used

Number of fixed telephone mainlines (Thousand people per 100 population; per cent per annum)

Fixed telephone lines refer to telephone lines connecting a subscriber's terminal equipment to the public switched telephone network and which have a dedicated port on a telephone exchange. Fixed telephone lines per 100 population is calculated by dividing the number of fixed telephone lines by the population and multiplying by 100. Aggregates: Calculated by ESCAP using total population as weight. Source: Calculated by ESCAP, using data from International Telecommunication Union, ICT Statistics Database, 16 July 2010. Available from www.itu.int/ITU-D/icteye/Indicators/Indicators.aspx; and United Nations, *World Population Prospects: The 2008 Revision*, Population Database, 28 April 2009. Available from <http://esa.un.org/unpp/>.

Number of mobile cellular subscriptions (Thousand people per 100 population; per cent per annum)

The number of users of portable telephones subscribing to a public mobile telephone service using cellular technology, which provides access to the public switched telephone network, expressed per 100 population. This includes analogue and digital cellular systems, including IMT-2000 (Third Generation, 3G). Post-paid and prepaid subscribers are included. Aggregates: Calculated by ESCAP using total population as weight. Source: Calculated by ESCAP using total population as weight. Source: Calculated by ESCAP, using data from International Telecommunication Union, ICT Statistics Database, 16 July 2010. Available from www.itu.int/ITU-D/icteye/Indicators/Indicators.aspx; and United Nations, *World Population Prospects: The 2008 Revision*, Population Database, 28 April 2009. Available from <http://esa.un.org/unpp/>.

Mobile cellular subscriptions as share of total fixed telephone lines (Percentage; per annum)

The proportion of mobile phones of all telephones. Aggregates: Calculated by ESCAP using total population as weight. Source: Calculated by ESCAP using total population as weight. Source: Calculated by ESCAP, using data from International Telecommunication Union, ICT Statistics Database, 16 July 2010. Available from www.itu.int/ITU-D/icteye/Indicators/Indicators.aspx; and United Nations, *World Population Prospects: The 2008 Revision*, Population Database, 28 April 2009. Available from <http://esa.un.org/unpp/>.

Number of Internet users (Thousands of people per 100 population; percentage per annum)

The total number of Internet users via fixed and mobile networks irrespective of the device used, expressed per 100 population. Aggregates: Calculated by ESCAP using total population as weight. Source: Calculated by ESCAP, using data from International Telecommunication Union, ICT Statistics Database, 16 July 2010. Available from www.itu.int/ITU-D/icteye/Indicators/Indicators.aspx; and United Nations, *World Population*

Prospects: The 2008 Revision, Population Database, 28 April 2009. Available from <http://esa.un.org/unpp/>.

Fixed broadband Internet subscribers (Thousand people per 100 population; per cent per annum)

The number of users of the Internet subscribing to paid high-speed access to the public Internet, expressed per 100 population. High speed is at least 256 kbit/s, in one or both directions. Fixed broadband Internet includes cable modem, DSL, fibre and other fixed broadband technology (such as satellite broadband Internet, Ethernet LANs, fixed-wireless access, Wireless Local Area Network, and WiMAX). Subscribers with access to data communications (including the Internet) via mobile cellular networks are excluded. Aggregates: Calculated by ESCAP using total population as weight. Source: Calculated by ESCAP using total population as weight. Source: Calculated by ESCAP, using data from International Telecommunication Union, ICT Statistics Database, 16 July 2010. Available from www.itu.int/ITU-D/icteye/Indicators/Indicators.aspx; and United Nations, *World Population Prospects: The 2008 Revision*, Population Database, 28 April 2009. Available from <http://esa.un.org/unpp/>.
