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Mainstreaming innovative information and communications technology in disaster risk reduction

Expanding connectivity to disaster-affected communities through the innovative use of information and communications technologies and disaster-related information

Note by the secretariat

Summary

The present document draws attention to the information and communication needs of early warning and disaster emergency response, discusses capacity gaps and reviews related experiences that have emerged from some of the recent major disasters in Asia and the Pacific. It also considers the potential role of innovative emerging technologies.

The Committee may wish to deliberate on the issues raised in the document and provide further guidance on the direction and functions of the proposed regional cooperative mechanism on disaster emergency communications, including enhanced access for countries with special needs and disaster-prone countries. The Committee may also wish to provide further guidance on outputs that could be reflected in the programme of work for the biennium 2014-2015.

Contents

I. Introduction

1. Information and communications technologies (ICTs), including space technologies and spatial information systems, have a vital function before, during and after a disaster situation. These technologies can enable early warning of an impending disaster, improve responses during the critical hours that follow a disaster and make the management of relief and recovery efforts in the ensuing period more effective.

2. ICT tools for disaster risk management cross a wide range of technologies, including: (a) remote sensing for systematic data gathering; (b) hazard monitoring and disaster assessment; (c) spatial information systems for assessing risks and vulnerability and planning responses; (d) broadband Internet websites and portals for critical information sharing; and (e) disaster communication systems, including satellite systems, terrestrial landline and wireless communications systems, television, radio, public address systems and mobile telephony, for conveying risk information and early warning messages and for responding to disasters. The technologies used typically involve both terrestrial and satellite systems to disseminate information most effectively.

II. Information and communications needs and gaps

3. At the earliest stage of a disaster — the most critical phase for minimizing loss of life among survivors — information on the location, nature and severity of the disaster must be communicated immediately. Also of key interest in readying a disaster response is the size of the afflicted area, the estimated number and location of the people affected and the scale of the damage. The information must flow among communities, different government ministries, administrative bodies and technical supporting agencies in order to activate relevant response plans and organize and coordinate response actions. Since disasters often destroy infrastructure that is vital to fulfilling these communication needs, it is essential to have the capability to deploy rapidly alternative communication systems that are not susceptible to damage from disasters, such as satellite-based communications.

4. After this critical phase, normally 24 to 48 hours, information needs become more diverse. Local voice communications between rescue and relief teams play a significant role in the coordination and utilization of relief resources and in making land transport infrastructure usable by emergency crews. Voice and data communications are also important in connecting survivors and their families for the return to normalcy of affected communities as soon as possible.

5. Another key need, sometimes overlooked due to acute rescue needs, is the monitoring and early warning of secondary disasters. Examples of secondary disasters include dam collapses, quake-lake outbursts, glacial-lake floods, landslides, wild fires and nuclear accidents. In this regard, the information needs shift to surveying, mapping, monitoring and analysis. That information is acquired by satellite and aircraft, networking between field teams and putting in place relevant administrative and technical support systems, including highly specialized teams that are set up to deal with complex technology.

6. The media, in all its forms, are playing an increasingly important role in disaster responses, not only as a first-hand gatherer of information, but also as intermediators of information gathered by others and as disseminators.

7. Connectivity to affected communities typically suffers from a range of gaps as the result of large-scale disasters. Terrestrial infrastructure is sometimes not available in the area where a disaster has occurred or is destroyed or severely damaged during the disaster. This lack of redundancy in information and communication services applies to all forms of ICT infrastructure, namely wire line, mobile telephony systems, power grids and mass media broadcast networks. Furthermore, prohibitively high costs impede the use of non-terrestrial or satellite-based communications systems.

8. There are also a range of people-centred information and knowledge gaps. For example, national authorities or even local authorities may not be fully utilizing the potential of community structures and systems as partners in disaster risk reduction. Early warnings may thus not be understood or acted on. A lack of access to reliable data further exacerbates the problem.

9. One of the objectives of the World Conference on Disaster Reduction, held in Kobe, Hyogo, Japan, in 2005, was "to increase the

reliability and availability of appropriate disaster-related information to the public and disaster management agencies in all regions".[1] Accordingly, one of the strategic goals listed in the Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities to Disasters, is "the development and strengthening of institutions, mechanisms and capacities at all levels, in particular at the community level, that can systematically contribute to building resilience to hazards".[2]

10. In its resolution 64/251 of 22 January 2010 on international cooperation on humanitarian assistance in the field of natural disasters, from relief to development, the General Assembly stressed the importance of strengthening international cooperation, particularly through the effective use of multilateral mechanisms, in the timely provision of humanitarian assistance through all phases of a disaster, from relief and recovery to development, including the provision of adequate resources. The Assembly recognized that information and telecommunication technology can play an important role in disaster response, encouraged member States to develop emergency response telecommunication capacities, and encouraged the international community to assist the efforts of developing countries in this area, where needed, including in the recovery phase.

11. In its resolution 64/2 of 30 April 2008 on regional cooperation in the implementation of the Hyogo Framework for Action 2005-2105: Building the Resilience of Nations and Communities to Disasters in Asia and the Pacific, the Commission recognized the urgent need to further develop and make effective use of scientific and technical knowledge to reduce vulnerability to natural disasters, and emphasized the need to facilitate the access of developing countries to technology in order to improve their ability to tackle natural disasters. The Commission also recognized that disaster risk reduction is a cross-cutting issue of great complexity, requiring understanding, knowledge, commitment and action, which should be addressed with the active participation of all stakeholders and that continued cooperation and coordination among Governments, the entities of the United Nations system, other regional and international organizations, non-governmental organizations and other partners were essential in order to address the impact of natural disasters effectively. The Commission also recognized the importance of linking disaster risk management with the policies, plans and programmes of regional frameworks, as appropriate, in order to address issues of poverty reduction and sustainable development.

12. In its resolution 64/1 of 30 April 2008 on the restructuring of the conference structure of the Commission, the Commission identified policy options and strategies on multi-hazard disaster risk reduction and mitigation, and regional cooperation mechanisms for disaster risk management, including space and other technical support systems, among other things, as issues to be addressed by the Committee on Disaster Risk Reduction.

13. At its first session, held in November 2008, the Committee on Information and Communications Technology recommended that the secretariat explore possibilities for developing regional and subregional disaster-communication standby systems by members and associate

[1] A/CONF.206/6 and Corr.1, chap. I, resolution 2, para. 10 (e).

[2] Ibid., para. 12 (b).

members and alternative means in synergy with the International Telecommunication Union (ITU), the Asia-Pacific Telecommunity (APT) and relevant stakeholders.[3] In this respect, the Regional Inter-agency Working Group on Information and Communications Technologies, which has more than 20 members representing United Nations entities and international organizations at its 14th meeting, held on 11 August 2010, agreed to promote an Asia-Pacific regional platform for disaster communications capacities.[4] This effort was supported by the Committee on Information and Communications Technology, which, at its second session, recognized the critical importance of communication capacity in ensuring the timeliness and efficiency of response actions to major disasters, and encouraged the secretariat to work closely with the Working Group, the Committee on Disaster Risk Reduction and the private sector to develop a more comprehensive analysis of the region's cooperative disaster communication capacities, including those for air traffic control and reporting.[5]

III. General trends

14. During the past decade, the Asia-Pacific region has experienced remarkable growth in the area of ICT. Related infrastructure and services have also improved, resulting in better reliability, higher speed and cost-effectiveness. Satellite communications, which represented a leap forward in regional connectivity about three decades ago, continues to improve: satellite broadband coupled with improved terminal performance and lower costs hold promise for the future. These improvements notwithstanding, more needs to be done to narrow the digital divide. The present section briefly highlights the key features of these trends.

A. Mobile telephone networks and broadband technology

15. In Asia and the Pacific, access to mobile telephony has expanded very rapidly and at a faster pace than in the rest of the world. The average annual mobile cellular subscriber growth rate for the region from 2005 to 2009 was 25.8 per cent, the second highest rate globally by region after Africa, while the average growth rate for the world during that period stood at 20.5 per cent.[6] Figure 1 shows that the average number of subscribers in Asian and Pacific countries has risen to 61.2 per 100 inhabitants. This rise is driven by China and India, for which the combined total of subscriptions added in 2010 is expected to have reached 300 million.[7]

16. The increased availability and affordability of mobile infrastructure and services and the resulting rapid growth in subscriptions to cellular mobile services have opened up new opportunities for the dissemination of disaster alerts. Consequently, mobile telephones and smart phones are quickly replacing radio and television as the best means of reaching communities in disaster areas. Entire communities can be warned about

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[3] See E/ESCAP/65/7, para. 11.

[4] See www.itu.int/ITU-D/asp/CMS/Events/2010/14th-IWG/index.asp.

[5] See E/ESCAP/67/9, para 47.

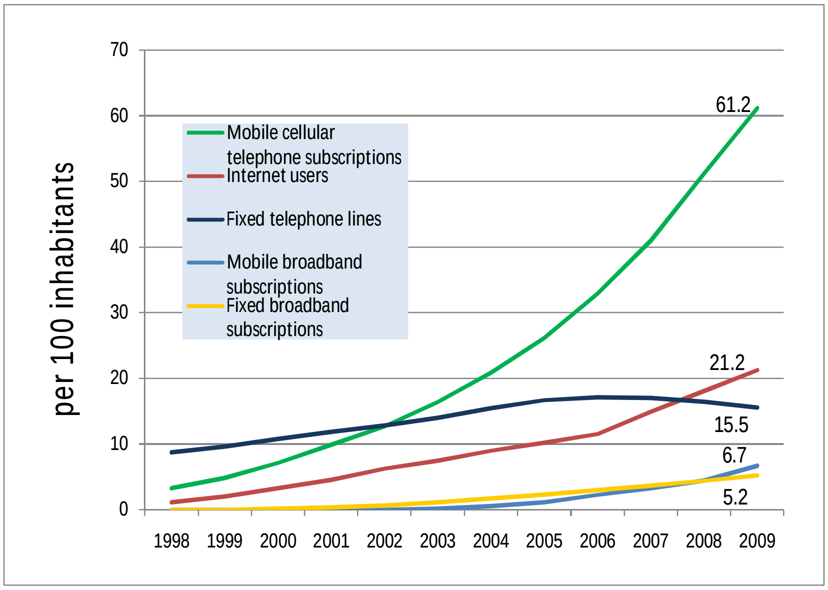
[6] International Telecommunication Union, ICT Statistics Database. Available from www.itu.int/ITU-D/ict/statistics/index.html.

[7] Ibid., *The World in 2010: ICT Facts and Figures*. Available from www.itu.int/ITU-D/ict/material/FactsFigures2010.pdf.

risks using common alerting protocol, short message service (SMS), Really Simple Syndication (RSS) feeds or Twitter,[8] among other means.[9] It also remains the most inexpensive form of communications. Additionally, in normal times, mobile telephony provides remote communities with access to constantly updated weather information.

17. In contrast to the above, growth in Internet usage in the Asia-Pacific region has been slower during the period from 2005 to 2009, with 19.7 users per 100 inhabitants.[10] Similarly, broadband penetration has lagged, with 4.8 users per 100 inhabitants on average,[11] creating a digital divide between the most advanced broadband countries (notably Japan and the Republic of Korea) and low-income developing countries of the region. This trend is worrisome because it limits the extent to which technological advances can be utilized fully for disaster risk management.

Figure 1
ICT growth in Asia and the Pacific



Source: ESCAP, using data from the ITU World Telecommunication/ICT Indicators Database 2010.

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[8] Mention of firm names and commercial products does not imply the endorsement of the United Nations.

[9] Abhas K. Jha and others, *Safer Homes, Stronger Communities: A Handbook for Reconstructing after Natural Disasters* (Washington, D.C., World Bank, 2010), p. 257.

[10] International Telecommunication Union (ITU), ICT Statistics Database. Available from http://www.itu.int/ITU-D/ict/statistics/index.html.

[11] Ibid.

18. Bandwidth is vital for facilitating global web-based access to geospatial information across technology infrastructures.[12] It facilitates the processing of data by significantly enhancing the speed of data downloading. Through higher bandwidths, countries can capture large amounts of pre-disaster information at the time it is needed. Furthermore, the web, as a universal platform that integrates and distributes diverse information systems, can overcome the decades-old technical challenges of interoperability. Given the catalytic role that high-speed Internet connections play in making the benefits of ICT available to people, particularly during disasters, bridging the broadband divide in the Asian and Pacific region remains a major task for national and regional policymakers.[13]

19. Consequently, a number of developing countries have redoubled efforts to roll out mobile broadband infrastructure. Long Term Evolution (LTE) and Worldwide Interoperability for Microwave Access (WiMAX) are among the emerging technologies that will play important roles in both fixed and mobile broadband Internet access, especially in providing broadband services for underdeveloped, rural and remote regions. The Asia-Pacific region is expected to take a leading role in the deployment of WiMAX, with considerable investment in new infrastructure planned in 2011.[14]

20. For terrestrial wireless services to function effectively, they need to be connected to local and global backbone networks, which are provided mostly through optical fibre infrastructure. In disaster situations, this infrastructure, if it existed, is destroyed by the disaster. To address emergency situations in high-risk areas, large and complex infrastructures, such as electricity and mobile phone networks, should be able to cope with massive service failures following disasters. While much depends on the scale and spread of the disaster, there are ways in which preparedness for disaster communications could be improved. One way is to avoid reliance on a single communications system, such as mobile phones, which may become overloaded or inoperable after a disaster. In this regard, satellite communications represent a major backup means for ground-based communications. Another effective measure could be to decentralize emergency management and control systems of a network to the local level, which would result in the network remaining operable in areas that have not been damaged. Finally, the resilience of existing terrestrial communications infrastructure could be improved by adhering to higher construction standards for mobile base stations and wireless transmission towers in high disaster-risk areas; providing higher power backup capacities and guaranteed scalability to handle the sudden increase in traffic that could occur during emergency disaster responses and increased network redundancy are also important.

[12] For a comprehensive discussion of the use of ICT as a tool to support the different phases of disaster management, see Chanuka Wattegama, “ICT for disaster management” (UNDP-Asia-Pacific Development Information Programme and the Asian and Pacific Training Centre for Information and Communication Technology for Development, 2007), available from: www.unapcict.org/ecohub/resources/ict-for-disaster-management.

[13] International Telecommunication Union, *Information Society Statistical Profiles 2009: Asia and the Pacific*. Available from www.itu.int/ITU-D/ict/material/ISSP09-AP_final.pdf..

[14] Ibid.

B. Integrated space technology and spatial information systems

21. Throughout the Asia-Pacific region, more than 70 geostationary Earth communications satellites are providing various services, such as television/audio/data transmission and broadcasting, Internet backbone, backhaul and individual access, networking and regional satellite mobile services. Ten of these satellites are operated by government agencies, while the others are commercially operated. Devices for accessing satellite services have been miniaturized to make them more convenient for rapid deployment during emergency response actions. Very small aperture terminals (VSAT) are used for accessing broadband services, and satellite mobile services may provide telephony and Internet access through portable terminals or handsets.

22. Satellite short message services provided by the Compass navigation satellite system of China demonstrated their value as the most reliable means of communication during the response to the Wenchuan earthquake in May 2008. The capacity of this system to provide services for other parts of the region is under development.

23. When ground-based broadband Internet is not available, connectivity can be established through satellite broadband services. Many communication satellites are providing such services with different geographical coverage and technical systems, and many kinds of terminals are suitable for rapid deployment, including those that can be air-dropped and carried to geographically problematic areas. Among the satellites providing broadband services, the IPStar satellite, launched by Thaicom, has established the widest service network, covering many Asia-Pacific countries.

24. Space-based technology is particularly effective in providing continuous information acquisition over broad geographic areas, as well as in distributing information to remote and less-serviced areas. The rapid development of space-based ICT and the integration of remote sensing, geographic information systems (GIS) and satellite positioning systems, have created a solid foundation for effective disaster monitoring and information and knowledge management. In short, advances in spatial information systems are revolutionizing the way risks and vulnerability to hazards are analysed, consequently improving disaster preparedness.

25. For example, GIS technology, using spatial data, enables different kinds of information to be combined as map overlays and analysed. This can include information on transport routes, power lines, flood hazard and seismicity zones, and the location of emergency services and facilities. The main users of this technology have been scientists and the emergency management services of national and local governments in developed countries and in some developing countries. However, non-governmental organizations have also utilized GIS for risk management in developing countries. For example, the RiskMap package of Save the Children was used to monitor trends in food security and the Philippine National Red Cross used GIS in a community-level disaster preparedness programme.[15]

[15] John Twigg, *Disaster Risk Reduction: Mitigation and Preparedness in Development and Emergency Programming*, Good Practice Review series (London, Overseas Development Institute, 2004), p. 47. Available from www.odihpn.org/documents/gpr9/part1.pdf.

26. Spatial positioning systems can be used to determine a person's position via satellites in real time anywhere on Earth. The Global Positioning System of the United States of America and the Global Orbital Navigation Satellite System of the Russian Federation are examples. The Galileo system of the European Union and Compass are being developed. In terms of dynamic mapping, the Office for the Coordination of Humanitarian Affairs, the Office of the United Nations High Commissioner for Refugees and United Nations humanitarian information centres are actively using spatial positioning technology and Google Earth to map and share dynamic georeferenced information to improve their work.

27. Low and moderate resolution Earth observation data are available for free. Since the 1970s, meteorological satellites have been the most important information source for monitoring and early warning of extreme weather events, such as tropical cyclones, windstorms and strong rainfall, and slowly developing drought risks. Many polar orbit satellites that are operated by China, the United States and various European countries may be utilized by countries in the region. This holds true also for quasi-polar satellites (operated by the Russian Federation) and geostationary orbit satellites (operated by China, India, Japan and the Republic of Korea). Moderate-Resolution Imaging Spectroradiometer data (around 250 m) are provided by the Terra and Aqua satellites operated by the United States, with many countries in the region having established facilities to receive data directly from the satellites or from relevant websites.

28. In affected areas, medium-resolution optical data provided by many Earth observation satellites are the most valuable information source for mapping out vulnerability and disaster risks, monitoring drought and wildfire disasters that affect vegetation and estimating disaster damage. Acquiring real-time and near real-time information repeatedly over large geographic areas can only be done by Earth observation satellites. Almost all public operators of Earth observation satellites, including those from countries in the region (China, India, Japan, the Republic of Korea, Thailand and Turkey), have committed to sharing their satellite information during major disasters. Some private operators of very high resolution (less than 1 m) Earth observation satellites have also joined such efforts in many major disaster situations, though without full commitment.

IV. Trends in people-centred connectivity and innovative information and communications technologies for disaster-affected communities

29. Currently, several promising technologies are being developed and/or being tested for use in various stages of disaster management. Some cellular handsets, in addition to having telephonic, short message service and multimedia message service capabilities, are now able to communicate their location through embedded Global Positioning System (GPS) functions. This satellite tracking system can map a person's location every few minutes and can thus be a powerful tool for search and rescue operations. However, mobile phone GPS functions are not without their critics, mainly due to their invasive nature and the concomitant privacy issues regarding tracking as well as concern over higher radiation emissions, which may, in the long run, be harmful to users, especially children and young adults.

30. Other related innovations that can be used for disaster response efforts include: an interface to display fully georeferenced text messages from the field on Google Earth in real time; a camera with a built-in satellite positioning system and wireless capability that can send images directly to a laptop via satellite; equipment that enables online communication via satellite; mobile-to-notebook communication and vice versa; an inflatable satellite communications device for short-term emergency outbreaks; and simultaneous instant messaging translation in multiple languages.

31. Though it has become common practice during disasters to set up temporary backup infrastructure, such as diesel-powered generators, container-based mobile telephony systems, microwave links and satellite communication equipment, the costs to do this can be prohibitive in geographically extended incident scenes. Efforts are being directed towards developing mobile-to-mobile communications without the use of infrastructure. An example of this is the Serval Project, in which researchers in Australia are testing network-free communications for emergency situations utilizing the signal broadcasting (Wi-Fi) capabilities of current mobile phone handsets and devices, such as small cell towers, to chain the network together to enhance connectivity during a disaster.[16] However, this type of ICT application will have to overcome spectrum policy and licensing issues, as with other communications methods currently used during emergencies.

32. Notwithstanding the rationale for shifting to more flexible disaster emergency communications technology, the effectiveness of the new systems and the new technologies in a disaster situation would depend on how efficiently they are used. One of the challenges is capacity development. Sophisticated technologies require a high degree of familiarity with the equipment and the operational protocols if it is to work efficiently when needed.

V. Experience gained during recent large-scale disasters in Asia and the Pacific

A. Floods in Pakistan

33. During the extensive flooding experienced by Pakistan in mid-2010, ICT, including space-based applications, enabled the Government and the international community to rapidly scale up emergency assistance in the vast geographical area affected by the disaster.

34. Satellite images taken on different dates and GIS databases were used extensively for situation analysis by virtually all the international humanitarian agencies. The dynamics of the flood waves were captured by a constellation of 17 orbiting satellites with more than 22 imaging sensors on board. These products were available free of charge to end-users for most of the critical days following the disaster. Furthermore, cooperative mechanisms at the international and regional levels, such as the International Charter on Space and Major Disasters, Sentinel Asia, the United Nations Platform for Space-based Information for Disaster Management and Emergency Response and the Operational Satellite Applications Programme of the United Nations Institute for Training and Research, provided free access to value added high resolution satellite data

[16] For more information on the Serval project, see http://www.servalproject.org.

that were made available and compiled by Government and private space agencies.

35. Earth observation satellites were used extensively, not only for rapid humanitarian response and early recovery, but also for flash appeals. The Pakistan Initial Floods Emergency Response Plan, which sought almost $460 million in contributions, was launched by the United Nations on 11 August 2010.[17] The appeal was based on GIS and remote sensing data on the affected areas, which were used to help mobilize international aid and support.

36. At the ground level, mobile phones in particular, as has been the case in many other disasters, proved most helpful in the dissemination of early warning messages in the long stretches of the Indus flood plain basin from north to south, which encompasses a geographical area of about 13 million hectares. An emergency telecommunications cluster was put in place to enhance the response capacity of the Government of Pakistan, the United Nations response team and non-governmental organizations. The World Food Programme (WFP) provided the first line of ICT support to the United Nations system in Pakistan. WFP, through its Fast Information Technology and Telecommunications Emergency and Support Team, provided the Government of Pakistan with direct assistance in evacuation and search and rescue efforts.

37. In addition to these in-country efforts, the social media facilitated communications and flash appeals between nationals and the diaspora. Images of the devastation were transmitted to mobile personal devices around the globe unceasingly, while at the same time helping to keep world attention on the tragedy, despite the relatively long duration of the disaster (3-4 months).

B. Twin disasters in Japan

38. On 11 March 2011, Japan experienced a powerful earthquake, registering a magnitude of 9.0 on the Richter scale. It was the world's fourth largest earthquake since 1900 and the largest in Japan since the advent of modern methods of seismic recording 130 years ago.[18]

39. Japan has advanced tsunami early warning systems that consist of 300 sensors (of which 80 are aquatic) around the archipelago, monitoring seismic activity at all times. This helped save thousands of lives, considering the enormity and unprecedented force of the earthquake and tsunami.

40. The disaster response was highly organized and instantaneous. An accurate and timely tsunami early warning was issued by the Japan Meteorological Agency at 14:49 hrs., three minutes after the earthquake occurred. The warning information was immediately disseminated to the public through various means, including sirens, community broadcasting,

[17] Food and Agriculture Organization of the United Nations, "Pakistan Initial Floods Emergency Response Plan 2010", 11 August 2010. Available from www.fao.org/emergencies/tce-appfund/tce-appeals/appeals/emergency-detail0/fr/item/44701/icode/?uidf=19653.

[18] United States Geological Survey, "Magnitude 9.0 – near the east coast of Honshu, Japan". Available from: http://earthquake.usgs.gov/earthquakes/recenteqsww/Quakes/usc0001xgp.php.

television, radio, the Internet and text messages. The Japan Meteorological Agency was also able to send out earthquake warnings to the public and vulnerable sectors, such as railroads and utilities, several seconds before the major quake reached them. The challenge was that the first tsunami wave arrived at the coast as early as 15:00 hrs. Then, maximum waves reached the coast in the most affected area between 15:00 and 16:00 hrs. This indicates that most people in the coastal area had only 10 to 60 minutes to take action after the warning message was disseminated to them. The observed height of the tsunami was 10 to 20 metres in the most severely affected areas, which was beyond the previous scientific estimate. So powerful was the force of nature that, in addition to the immediate loss of human life and economic assets due to the earthquake and tsunami, Japan experienced another disaster resulting from damage to the Fukushima nuclear power plant.

41. ICT was utilized as effectively as possible in the search and rescue operations. At the request of the Government of Japan, ITU deployed emergency telecommunications equipment to areas severely affected by the tsunami. A total of 78 Thuraya satellite phones equipped with GPS to facilitate the search and rescue efforts along with 13 Iridium satellite phones and 37 Inmarsat Broadband Global Area Network terminals were activated. An additional 30 Inmarsat terminals were stockpiled for reinforcement. Re-establishing vital communication links in the immediate aftermath of the disasters was crucial in order to ensure timely intervention and support for the victims, and to assist in the rescue and rehabilitation efforts.[19]

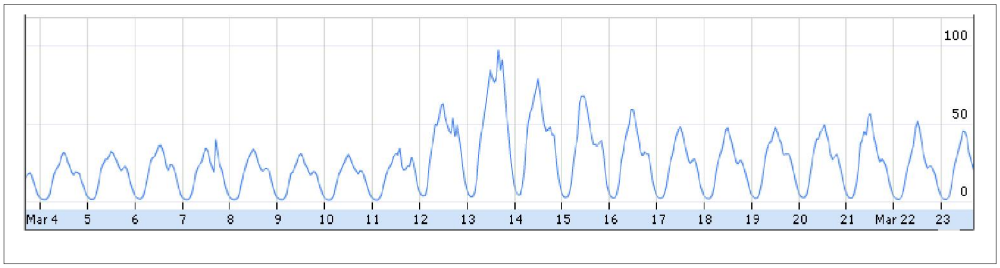
42. Social media played a strong role in the post-tsunami efforts in Japan. The most dramatic videos of the unfolding events were captured by individuals using their phones or cameras and posted on social media networks. Mixi, a Japanese version of Facebook, was used to enhance disaster relief efforts, while database and mapping tools, such as Ushahadi and Esri, were deployed to collect information from social media for crisis-mapping purposes, such as ascertaining the geographic origin of text messages, in order to better understand the disaster.

43. Through social media, the affected population obtained access to up-to-date news, disaster message boards, maps, and transportation, blackout and shelter information.[20] Different functions of Google used in the disaster response effort were already well established. These included Google Person Finder, which had been developed after the Haiti earthquake in 2010, and the Google Crisis Response Centre, which provided specific information on the event. The traffic on Google services, such as Google Earth, Google Maps and Google News, spiked significantly during and after the disaster. Figure 2 shows the dramatic increase in traffic experienced on Google Earth in the days after the disaster.

[19] International Telecommunication Union, "ITU deploys satellite communication in Japan", 16 March 2011. Available from www.itu.int/net/pressoffice/press_releases/2011/06.aspx.

[20] Joyce Shoemaker-Galloway, "Social media plays pivotal role in Japanese earthquake and tsunami", 14 March 2011. Available from www.suite101.com/content/social-media-plays-pivotal-role-in-japanese-earthquake--tsunami-a358216#ixzz1GZ3byQoN.

Figure 2
Japan traffic on Google Earth divided by worldwide traffic and normalized
(*Scaled in units from 0-100 per cent*)



Source: www.google.com/transparencyreport/traffic.

C. Wenchuan earthquake

44. On 12 May 2008, the Chinese province of Sichuan was struck by an earthquake which registered 8.0 on the Richter scale. The quake totally disabled telecommunications in the eight most damaged counties for at least 30 hours, hampering rescue and relief operations.

45. Urgent telecommunications needs were first met by satellite-based means, while 25,000 persons were mobilized to restore the telecommunications facilities that had been seriously damaged. A total of 383 emergency telecommunications vehicles were dispatched, many of them equipped with satellite communications facilities. However, road damage prevented them from reaching some of the most seriously hit areas. Consequently, more than 2,000 satellite mobile handsets were deployed.

46. Within four days, cellular mobile services were restored via satellite in some of the most seriously hit areas. Broadband links were established by more than 1,300 satellite terminals, some of which had to be air dropped or carried to their location on foot. These systems were used for networking, transmitting remote-sensing images, holding videoconferences among decision makers and using telemedicine among field teams and major supporting hospitals.

D. Common trends

47. These were different disasters: they occurred under different circumstances; they were of different natures; and the development levels and coping capabilities of the countries affected by them varied widely. Yet, the response efforts revealed some common trends:

(a) Social media has come to the forefront as an additional tool in helping to manage disaster situations more effectively. The rapid roll-out of broadband infrastructure would be key to developing its full potential. The use of satellite broadband holds promise for tackling last mile issues and bringing connectivity to unconnected areas in geographically isolated or topologically difficult terrains. It is expected that, in the immediate aftermath of future disasters, more extensive use will be made of social media networks by both the Government and the affected people and communities to enhance connectivity, provided that alternative telecommunication infrastructure can be set up quickly and extensively in the disaster area;

(b) The instantaneous multidirectional flow of information brought about by technological advances has reaped immense benefits. However, looking forward, it is also important to be cognisant of its downside: the potential spread of misinformation. This factor imposes special challenges on Governments. Regardless of the nature of the disaster or the country involved, decentralized communications will mean the loss of a single recognized voice, and Governments will be hard pressed to carve out a complementary role that makes up for that loss. Such a voice assumes importance during disaster recovery because trust and collaboration are needed. This means addressing the challenge of releasing information that is correct and credible in order to gain the public's confidence without causing panic among the population at large. Consequently, as part of their disaster preparedness plans, Governments will need to pay more attention to the strategic use of various media, including the IT-based social media. They will also need to be prepared to constantly renew and adapt their disaster information management strategies and incorporate them into their disaster preparedness plans. In an information society, image meltdowns spread quickly and bring additional crises that often exacerbate the effects of the existing disaster unnecessarily.

These trends are expected to continue to evolve in the future.

VI. Proposed regional platform for addressing gaps in and building disaster emergency communications capacity

48. Lessons learned from recent disaster emergency situations in the Asia-Pacific region show how contending with the repercussions of disasters is often beyond the capacity of a single country. This is especially true for many developing countries in Asia and the Pacific. Thus, post-disaster situations can be managed more effectively if the regional response to the disaster makes use of synergies developed through cooperation.

49. Primary disaster emergency communications capacity refers to the standby capacity for the rapid deployment of communications equipment during a disaster. This type of capacity requires the ability to stockpile rapidly deployable emergency communications equipment and/or ship and install the equipment quickly. It also entails being able to repair the equipment on short notice. For areas prone to major destructive disasters, such capacity should be able to withstand the initial disaster. It may also be used to support early warning and emergency communications in the early stages of disaster management.

50. Satellite-based information is indispensable for disaster reporting and communications. However, the high costs involved in building capacity in this area and keeping it at a fully operational level may be beyond the capability of most developing countries. Cost-efficient disaster communications capacity should make use of all infrastructure and services available to the areas concerned in order to ensure accessibility and usefulness. Such capacity should be able to be activated and put into effect on short notice.

51. A cooperative mechanism, such as a regional platform for disaster emergency communications capacity, would provide institutional and technical support for high-risk developing countries. As indicated in paragraph 13 above, the Regional Inter-agency Working Group on Information and Communications Technologies at its 14th meeting agreed

to promote an Asia-Pacific regional platform for disaster communications capacities, with a collaborative emergency communications capacity as its core component. In this regard, ESCAP, APT and ITU, as well as other members of the Working Group discussed an approach which included the following points:

(a) The involvement of user communities and development assistance agencies, which includes national disaster management authorities and response agencies at different levels, international humanitarian assistance entities, such as the Office for the Coordination of Humanitarian Affairs, WFP, and governmental and non-governmental disaster response organizations, such as the International Federation of Red Cross and Red Crescent Societies;

(b) Joint efforts of development agencies, such as the United Nations Development Programme, the Asian Development Bank and the World Bank, and governmental development aid agencies active in the region, such as the Japan International Cooperation Agency;

(c) Building partnerships with satellite operators and equipment vendors that have expressed an interest in making affordable equipment and services available to all stakeholders. A number of them have contacted the secretariat and ITU to convey their willingness to be part of a joint regional platform;

(d) Building capacity in emergency communications and enhancing coordination among disaster management and telecommunications authorities requires the formulation of relevant policy frameworks as well as the establishment of institutions.

52. As the main economic and social development centre of the United Nations in Asia and the Pacific, ESCAP provides a platform for policymakers involved in inclusive and sustainable development in the region. Through its well-established Regional Space Applications Programme for Sustainable Development, the secretariat could act as a policy-level intermediary between the communications and disaster management communities to promote multi-stakeholder and public-private partnerships. Other United Nations entities and intergovernmental bodies, including APT, ITU and other members of the Regional Inter-agency Working Group, as well as the Association of Southeast Asian Nations and the South Asian Association for Regional Cooperation may work together with the ESCAP secretariat towards the realization of the regional platform.

53. The regional platform's collaborative capabilities could be placed into two major categories: (a) rapidly deployable standby equipment and services for emergency response; and (b) pre-disaster capacity for reporting and early warning.

54. Such a platform would have the following functions:[21] the pooling of, among other things, equipment and human and financial resources needed to build and enhance effective disaster communications

[21] Wu Guoxiang, "Asia-Pacific regional platform for disaster communications management and capacities", joint concept prepared for the fourteenth meeting of the Regional Inter-agency Working Group on Information and Communications Technologies, Bangkok, August 2010. Available from ww.itu.int/ITU-D/asp/CMS/Events/2010/14th-IWG/ESCAP_presentation.pdf.

management in the region; the rapid deployment of those resources upon request to assist countries hit by major disasters or experiencing emergencies; the provision of extensive communications services for humanitarian assistance and rescue operations; the establishment of a national emergency telecommunications plan and the harmonization of the plan to the extent feasible across countries; further awareness raising on and the facilitation of the ratification and implementation of the Tampere Convention on the Provision of Telecommunication Resources for Disaster Mitigation and Relief Operations,[22] which went into effect on 8 January 2005,[23] with the aim of removing regulatory barriers on cross-border telecommunication resource movements for humanitarian assistance.

VII. Issues for consideration by the Committee

55. The Committee may wish to deliberate on the importance of disaster-related communications as a critical component of national capacity for disaster risk management and advise the secretariat on the gaps and needs in member countries that could be addressed through collaborative communications and disaster emergency capacities in the region.

56. The Committee may wish to consider the proposal for a regional cooperative mechanism on disaster emergency communications and provide the secretariat with guidance on the direction and functions of such a mechanism.

57. The Committee may wish to provide strategic direction and suggest possible outputs that could be reflected in the programme of work for the biennium 2014-2015.

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[22] United Nations, *Treaty Series*, vol. 2296, No. 40906.

[23] The following ESCAP member States are signatories to the Tampere Convention: Armenia, India, Marshall Islands, Mongolia, Nepal, Pakistan, Russian Federation, Sri Lanka, Tajikistan, Tonga, United Kingdom of Great Britain and Northern Ireland, United States of America and Uzbekistan.