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A/AC.105/C.1/2006/CRP.13
23 February 2006

Original: English

COMMITTEE ON THE PEACEFUL USES OF
OUTER SPACE
Scientific and Technical Subcommittee
Forty-third session
Vienna, 20 February-3March 2006
Agenda item 12
Space-system-based disaster management support

Activities of specialized agencies in the United Nations system on the subject of space-system-based disaster management support

Introduction

1. In paragraph 10 (b) of its resolution 60/99, the General Assembly endorsed the recommendation of the Committee on the Peaceful Uses of Outer Space that the Scientific and Technical Subcommittee, at its forty-third session, consider the item on "Space-system-based disaster management support" in accordance with the workplan adopted by the Subcommittee at its forty-first session (A/AC.105/823, annex II, para. 15) and as amended at its forty-second session (A/AC.105/848, annex I, para. 21).

2. According to the workplan, among other things, the Subcommittee, at its forty-third session, should exchange information with specialized agencies in the United Nations system on their activities on the subject of space-system-based disaster management support, as well as the regional disaster management structures.

3. The present document contains written reports received by the Office for Outer Space Affairs from those specialized agencies.

V.06-51376 (E)

I. International Telecommunication Union

1. Background

1. The International Telecommunication Union (ITU) is the United Nations specialized agency concerned with the development of telecommunication networks and services worldwide. It has three sectors: the Telecommunications Development Sector (ITU-D), the Radiocommunication Sector (ITU-R) and the Telecommunications Standardization Sector (ITU-T), whose work is coordinated by the respective bureaus: Telecommunication Development Bureau (BDT), Radiocommunication Bureau (BR) and Telecommunication Standardization Bureau (TSB).

2. ITU has been actively involved in work related to disaster relief and mitigation. In 1998, ITU was involved in the drafting of the Tampere Convention, a treaty that eventually came into effect on 8 January 2005. In 2002 the World Telecommunication Development Conference adopted Resolution 34 (telecommunication resources in the service of humanitarian assistance) and Recommendation 12 (consideration of disaster telecommunication needs in telecommunication development activities). The ITU Plenipotentiary Conference of 2002 adopted Resolution 36 (telecommunication in the service of humanitarian assistance) and in 2003 the World Radio Conference adopted Resolution 646 (definition of reserved spectrum for emergency communications). ITU-R developed recommendations on global circulation of equipment (M.1637, and M.1579), ITU-R Report M.2033 on the needs of future systems for public protection and disaster relief, Recommendation M.1042-2 on disaster communications in the amateur and amateur-satellite services and Recommendation F.1105 on the use of transportable fixed radiocommunications equipment for relief operations. ITU-T produced recommendations that provide preferential schemes for the public switched telephone network (PSTN) (E.106) and in IP-based systems (H.460.4 and H.460.14 in H.323 system and J.260 in IP-Cablecom). In 2002 ITU-D developed a project that resulted in a co-financing arrangement between Inmarsat Limited and ITU aimed at helping countries respond more effectively to disasters through the use of satellite terminals. This project is currently being implemented as part of the effort of ITU to provide relief to the countries affected by recent earthquakes and the recent tsunami.

3. In 2004, ITU-D also worked on a new Handbook on Emergency Telecommunications that was published in January 2005. This handbook built on the initial work by the ITU-D Study Group 2 (1998-2002) that produced the Handbook on Disaster Communications.

2. ITU-D Activities

4. The development arm of the ITU considers disasters an integral part of its mandate. Universal access to telecommunications, and its associated information and communication services and applications, is at the core of attempts to reduce vulnerability and thereby lessen the associated risks and prevent them transforming into disasters.

5. The work of ITU-D can be summed up in four principles: multi-hazard, multi-technology, multi-phased and multi-stakeholder.

2.1 Multi-hazard

6. Whether natural or man-made, disasters come in different forms (cyclones, floods, droughts, tsunamis, fires and earthquakes). Telecommunications provide the necessary medium and link to mitigate disasters irrespective of their nature.

2.2 Multi-technology

7. In mitigating the disastrous effects of hazards, ITU-D promotes the use of any form and means of communication that can contribute to universal access or access by the majority of the

people. Those with access to broadcasting radio receivers, Internet, mobile phones, etc. should be able to be reached wherever they are.

2.3 Multi-phased

8. Preventive and proactive strategies have a great potential to reduce vulnerability of communities. In this respect, ITU-D considers telecommunications critical at all stages (prevention, preparedness, response and relief) of disaster management. Reconstruction of disrupted telecommunication networks is also an important element in ensuring sustainable development.

2.4 Multi-stakeholder

9. It is only through forging partnerships with development partners that ITU-D can ensure access to information and communication technologies (ICT), especially those in remote rural communities. The local community, the central government, the private sector, civil society and international organizations can rally to contribute to the development of ICT, which can result in a truly information society.

2.5 Examples of some recent activities

10. Some recent activities include:

- deployment of satellite terminals and provision of operational and technical training;
- assessment of damage to networks;
- participation in network reconstruction effort;
- resource mobilization (to augment ITU's US$250,000);
- provision of expertise as required to plan and deploy systems and to set-up specific projects;
- development of documentation, best practices, etc.; and
- training and capacity building.

3. ITU-R Activities

11. Telecommunication is critical during all phases of disaster management. Aspects of radiocommunication services associated with disasters include, inter alia, disaster prediction, detection, alerting and disaster relief. In certain cases, when the "wired" telecommunication infrastructure is significantly or completely destroyed by a disaster, only radiocommunication services can be employed for disaster relief operation.

12. Two major tasks of the ITU-R – ensuring the effective use of the radio-frequency spectrum and studies concerning development of radiocommunication systems- concern all radicommunication services. Moreover, the Radiocommunication Study Groups carry out studies related to the continuing development of radiocommunication systems used in disaster mitigation/relief operations and these can be found within work programmes of the Radiocommunication Study Groups (see Table 1).

13. Disaster relief communication crosses the scope of many of the Study Groups. Whilst the mobile service might be viewed as the one that is most predominantly involved, the fixed service plays a role in the provision of point-to-point links, as well as fixed wireless access applications especially when broadband needs arise. Broadcasting is an obvious means to disseminate alerts to the public. Satellite services, both fixed and mobile, can provide decentralized operations using very small aperture terminals (VSATs), as well as the amateur service, which has a long history in assisting with radiocommunications during emergencies and disaster events. Equally important as these communication services is the scientific side of the problem. The meteorological and Earth exploration satellite services play a major role in prediction and detection of disasters, retrieving and relaying data from monitoring equipment (e.g. on buoys) to land-based siren systems. More advanced systems will involve remote sensing of the ocean temperature, the

variations of which can be linked with seismic activity. It is essential that the frequencies allocated to these passive services remain free of interference and such spectrum issues fall not only within the purview of Study Group 7 but also Study Group 1 as regards compatibility with other services and the assessment of potential interfering sources, especially those using new technologies such as Ultra-Wideband (UWB). In this respect, the World Radiocommunication Conference (WRC-07) will consider several agenda items relating to the development and protection of science services, including those using passive sensors.

Table 1

Disaster phases	**Major radiocommunication services involved**	**Major tasks of radiocommunication services**	**Studies carried out by Radiocommunication**
Prediction & Detection	Meteorological services (meteorological aids and meteorological satellite service) and Earth exploration satellite service	Weather and climate prediction. Detection and tracking of earthquakes, tsunamis hurricanes, typhoons, forest fires, oil leaks etc. Providing warning information	Study Group 7
Alerting	Amateur services	Receiving and distributing alert messages	Study Group 8
	Broadcasting services terrestrial and satellite (radio, television, etc.)	Disseminating alert messages and advice to large sections of the public	Study Group 6
	Fixed services terrestrial and satellite	Delivering alert messages and instructions to telecommunication centres for further dissemination to the public	Study Group 9 Study Group 4
	Mobile services (land, satellite, maritime services, etc.)	Distributing alert messages and advice to individuals	Study Group 8
Relief	Amateur services	Assisting in organizing relief operations in areas (especially when other services are still not operational)	Study Group 8
	Broadcasting services terrestrial and satellite (radio, television, etc.)	Coordination of relief activities by disseminating information from relief planning teams to population	Study Group 6
	Earth exploration satellite service	Assessment of damage and providing information for planning relief activities	Study Group 7

Disaster phases	Major radiocommunication services involved	Major tasks of radiocommunication services	Studies carried out by Radiocommunication
	Fixed services terrestrial and satellite	Exchange of information between different teams/groups for planning and coordination of relief activities	Study Group 9 Study Group 4
	Mobile services (land, satellite, maritime services, etc.)	Exchange of information between individuals and/or groups of people involved in relief activities	Study Group 8

14. ITU-R is also invited to pursue studies on the further identification of suitable frequency bands that could be used on a global/regional basis for public protection and disaster relief (PPDR), as well as on facilitating cross-border circulation of equipment intended for use in emergency and disaster relief situations - the second of these tasks being reinforced by the Tampere Convention on the provision of telecommunication resources for disaster mitigation and relief operations. Impetus for the work also comes from several Resolutions of World Radiocommunication Conferences (Resolution 644 of WRC-2000, Resolution 646 of WRC-03) requesting ITU-R to study aspects of radiocommunications relevant to disaster mitigation and relief operations.

15. Some additional material is presented in Annex 1 regarding on-going studies in public warning and disaster relief with respect to the meteorological satellite, Earth exploration satellite and space research services, and in Annex 2 with respect to the broadcasting satellite service.

4. ITU-T Activities

16. ITU-T work concentrates on the development of technical standards ("Recommendations") for information and telecommunications technologies. ITU-T is not involved in emergency and disaster relief operations per se, however it develops recommendations that are fundamental for the implementation of interoperable systems and telecommunication facilities that will allow relief workers to smoothly deploy telecommunication equipment.

17. A number of recommendations have been developed for call priority schemes (that would ensure that relief workers would get communication lines when they need to) for all systems under ITU-T responsibility (see URL below for link to ITU-T recommendations):

- PSTN/Integrated Services Digital Network (ISDN): E.106;
- Internet Protocol (IP)-based systems using H.323: H.460.4 and H.460.14; and
- IP-based systems using IP-Cablecom: J.260.

Other applicable recommendations include:

- Telecom network management in emergency situations: M.3350; and
- Framework for support of emergency communications in the Next Generation Network: Y.1271.

18. In order to better support and coordinate its standardization work, ITU-T has established a coordination group called Partnership Coordination Panel on Telecommunications for Disaster

Relief (PCT-TDR). The PCP-TDR gathers people working with standardization of telecommunications technologies for disaster relief and representatives of relief organizations, such as the Office of the United Nations High Commissioner for Refugees (UNHCR), the United Nations Office for the Coordination of Humanitarian Affairs (OCHA), the International Federation for Red Cross and Red Crescent Societies (IFRC) and Télécoms sans Frontières (TSF).

19. ITU-T also created an ITU-T Action Plan for Standardization on Telecommunications for Disaster Relief and Early Warning (TDR/EW), motivated by the identification of the need for new telecommunication standards following the Indian Ocean tsunami of December 2004. This first version was sent to all ITU-T technical committees (Study Groups) for their action and comment, and some have already responded. For example, Study Group 16 has started the development of a specification to allow message broadcast over H.323 Voice-over-IP systems, which would support early-warning delivery. All Study Groups were encouraged to increase their activities in the definition of recommendations and other materials (e.g. handbooks) on TDR/EW and to provide feedback to the Telecommunication Standardization Advisory Group (TSAG) and ITU-T Study Group 2 (which is to coordinate the effort) on actions taken and on proposals for improvement to the Action Plan.

5. Tsunami-related activities

20. In the aftermath of the earthquake and tsunami of 26 December 2004, ITU contacted the countries that had been affected by the disaster and offered them assistance. In the immediate term, the offer was to assist the countries with Inmarsat satellite terminals with the airtime paid by the ITU. This offer was accepted by Sri Lanka, which then received 14 terminals and related training in the use of that equipment. Thailand only required technical and operational training in the use of those terminals. This training was successfully delivered. ITU was also to carry out an assessment of the damage to the telecommunication infrastructure of the affected countries. That exercise was carried out resulting in the drafting of country-specific project documents. In the medium term, resource mobilization was envisaged and this is ongoing. In the long-term, ITU would then support efforts for reconstruction and rehabilitation of the damaged networks. This will commence soon.

21. ITU-D established a Tsunami Emergency Team that worked with the affected countries to assess their immediate needs. Four project documents on the rehabilitation and reconstruction of telecommunication infrastructure in Bangladesh, Indonesia, Maldives and Sri Lanka were then drafted and submitted to the Telecom Surplus Steering Committee that immediately approved seed money to the tune of US$250,000 and requested that other partners be found to augment these funds. To date, the Australian Government has offered a sum of $452,000 and one ITU-D private sector member has offered to contribute 50,000 euros (€).

22. At its meeting from 14 to 18 March 2005, TSAG endorsed the "Action Plan for Standardization on Telecommunications for Disaster Relief and Early Warning." Study groups are encouraged to provide feedback on the actions taken and improvements to the Action Plan. (TSAG R-3/Annex A).

23. Since January 2005, ITU has participated in a series of high-level international meetings seeking to enhance preparedness through early warning systems, response and relief, and reconstruction. ITU used these occasions to highlight its ongoing work in the three sectors related to disaster mitigation through an ICT based multi-hazard approach and also reinforced its position as the competent United Nations specialized agency that can help the international community with appropriate solutions aimed at ensuring timely information dissemination, be it during early warning or relief and response.

24. To effectively showcase the work of ITU on emergency telecommunications, several web resources were organized on the ITU website. The main webpage is located at: http://www.itu.int/emergencytelecoms/.

6. Challenges for the future

25. ITU has to continue to coordinate its work in the three sectors aimed at disaster relief and mitigation. The challenge is to bring information dissemination to centre stage in all the ongoing disaster mitigation work. The strategy should be to promote the use of ICT for multi-hazard preparedness, response and relief and to ensure that current efforts to establish early warning systems take into account the need for reliable and timely telecommunications networks that provide a variety of channels of communication such as broadcasting, the Internet, mobile through voice and short messaging service (SMS), etc. As new technologies emerge, they should have embedded emergency telecommunications features that follow relevant telecommunications standards (such as appropriate spectrum for emergency telecommunications), and appropriate regulatory frameworks should be developed seeking to facilitate the deployment and use of telecommunications equipment for relief. Raising adequate financial resources that are readily available and can easily be deployed to help countries affected by disasters remains a big challenge. Partnership building with satellite, fixed and mobile operators, industry and governments is therefore critical. Promoting the implementation of the Tampere Convention remains a big challenge among those countries that have ratified the Convention.

7. Some web resources

- ITU homepage for emergency telecommunications: http://www.itu.int/emergencytelecoms
- ITU-D Home page for emergency telecommunications: http://www.itu.int/ITU-D/emergencytelecoms
- ITU-R Home page for emergency telecommunications: http://www.itu.int/ITU-R/information/emergency
- ITU-R Recommendations: http://www.itu.int/rec/recommendation.asp?type=series&lang=e&parent=R-REC
- ITU-T Home page for emergency telecommunications: http://www.itu.int/ITU-T/emergencytelecoms
- ITU-T Recommandations: http://www.itu.int/rec/recommendation.asp?type=series&lang=e&parent=T-REC
- ITU-T PCP-TDR: http://www.itu.int/ITU-T/special-projects/pcptdr
- ITU-T Action Plan for Standardization in TDR/EW: http://www.itu.int/ITU-T/emergencytelecoms/actionplan.html

ANNEX 1

Undergoing studies with respect to prediction and detection aspects in the meteorological-satellite, Earth exploration satellite and space research services.

Recognizing that effective and prudent management of frequency bands is paramount to maintaining and enhancing the quality and accuracy of weather and weather-related predictions, WRC-03 took several decisions concerning the frequency bands used by meteorological services. WRC-03 had a favourable outcome and closed serious issues that had been debated since 1992, including the bands 401-406 MHz, 1675-1710 MHz (radiosondes and meteorological satellites) and 2700-2900 MHz (meteorological radar), which were consolidated into important allocations for meteorological operations.

Considering the importance of monitoring the weather and other environmental processes and managing limited natural resources, WRC-03 included in the agenda of the next conference (WRC-07) several items directly related to the use and the further development of meteorological and Earth exploration-satellite services:

Article I. 1.2 to consider allocations and regulatory issues related to the Earth exploration satellite (passive) service, space research (passive) service and the meteorological satellite service in accordance with Resolutions 746 (WRC-03) and 742 (WRC-03);

A.I. 1.3 in accordance with Resolution 747 (WRC-03), consider upgrading the radiolocation service to primary allocation status in the bands 9 ,000-9 ,200 MHz and 9 ,300-9, 500 MHz and extending by up to 200 MHz the existing primary allocations to the Earth exploration satellite service (EESS) (active) and the space research service (SRS) (active) in the band 9 ,500-9, 800 MHz without placing undue constraint on the services to which the bands are allocated;

A.I. 1.20 to consider the results of studies and proposals for regulatory measures if appropriate regarding the protection of the EESS (passive) from unwanted emissions of active services in accordance with Resolution 738 (WRC-03);

In order to allow further development of meteorological and Earth exploration satellite services, Working Parties of the ITU-R Study Group 7 (SG 7) have prepared several drafts of new and revised ITU-R Recommendations such as:

- Draft new Recommendation ITU-R SA.[OPTICAL METAIDS] - Technical and operational characteristics of ground-based meteorological aids systems operating in the frequency range 272-750 THz ;
- Draft new Recommendation ITU-R SA.[USE 1.7 GHz] - Use of the band 1 668.4-1 710 MHz by the meteorological aids service and meteorological satellite service (space-to-Earth); and
- Draft revision of Recommendation ITU-R SA.1159-2 - Performance criteria for data dissemination, data collection and direct data readout systems in the Earth exploration satellite service and meteorological satellite service.

These documents will be discussed at the next SG 7 meeting in November 2005.

ITU-R SG 7, together with the World Meteorological Organization (WMO), is planning a new version of the ITU/WMO Handbook “Use of Radio Spectrum for Meteorology”, which should describe the most recent methods and systems. The Study Group is also developing several ITU-R reports concerning Earth exploration satellite services.

ANNEX 2

Undergoing studies in public warning and disaster relief with respect to broadcasting-satellite service

- Liaison statement on Disaster relief radiocommunications with respect to broadcasting satellite service (BSS)
- Proposed draft new question on the broadcasting means for public warning and disaster relief

Source: Document 6/183

LIAISON STATEMENT TO STUDY GROUP 6

NOTE TO THE DIRECTOR OF THE RADIOCOMMUNICATION BUREAU

Disaster-relief radiocommunications with respect to BSS

At its meeting in March-April 2005, Working Party 6S (WP 6S) considered input Document 6S/74 from the SG 6 Chairman on Disaster-relief radiocommunications. WP 6S wishes to provide its views on the important role of the broadcasting satellite service (BSS) in the occasion of disasters as follows:

1) The BSS systems provide a very powerful means to reach large sections of the public with alert to citizens before a disaster occurs (e.g. tsunami forecast).

2) In some countries, alert systems such as the emergency warning system (EWS) or emergency alert broadcasting have been implemented in which broadcasting stations are connected to governmental or international organizations, which issue the disaster forecast. In some cases, a broadcasting station has its own seismometers in the country, analyzes the seismic intensities and voluntarily issues precautions to the public through broadcasts.

3) The BSS systems offer the opportunity for disseminating information and advising small or large populations within and across national borders, in order to promptly provide correct information on the disaster situations to the public, so that panic can be avoided. In addition, BSS systems can help alleviate the effects of the possible successive disasters such as an aftershock or tsunami, so that the public can take suitable action.

4) The BSS plays an important role in providing information on the well being of individuals, especially from the affected area.

5) Any BSS system is very robust since the broadcasting satellite itself never suffers from the disasters on the Earth. Stationary parabolic receive installations may not survive the attack of an earthquake or tsunami. In the 1-3 GHz bands, however, the BSS receivers are small and portable, and anyone can receive information through broadcasting satellites at any place and at any time.

6) In order to establish such alerting/relief systems, WP 6S wishes to initiate its technical studies on the BSS means to disseminate alerts and help to the public, *inter alia*, with a scope

– to cooperate within ITU (ITU-R, ITU-T and ITU-D) and with international organizations such as the UN Working Group on Disaster Relief, which develop emergency alert systems such as Tsunami Early Warning Systems;

– to make operational BSS/feeder-link assignments available, on a temporal basis, to cover urgent needs for additional FSS capacity, i.e. for bidirectional radiocommunications.

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QUESTION ITU-R 118/6

Broadcasting means for public warning and disaster relief

(2005)

The ITU Radiocommunication Assembly,

considering

a) the natural tragedies due to earthquakes and their consequences, alongside the possible role of radiocommunications in disaster relief;

b) the initiative of the Secretary-General of ITU to contribute to global efforts in order to reduce the effects of possible future disasters;

c) the general aspects of telecommunications associated with such disasters including, *inter alia*, prediction, detection, alerting and the organization of relief efforts;

d) the existence of numerous radiocommunication systems and the availability of a large equipment base at the present time;

e) the necessity to establish work programmes in ITU-R Study Group 6 in developing Reports and Recommendations on this matter,

decides that the following Question should be studied

1 What radiocommunication systems are used to detect potential disasters and to alert and support relief efforts?

2 What broadcasting systems are available for disseminating information and advising small or large populations and, potentially, across national borders?

3 What frequency bands, assigned to the broadcasting service and the satellite broadcasting service, may be used for disseminating information and advising small or large populations and, potentially, across national borders?

4 What broadcasting and satellite broadcasting equipment is currently available for use in the event of a major disaster?

5 What procedures currently exist to coordinate the efforts of the broadcasting and the satellite broadcasting sectors at an international level?

6 What actions do broadcasters around the world currently take in response to major disasters?

further decides

1 that the results of the above studies should be included in (a) Report(s) and/or in (a) Recommendation(s);

2 that the above studies should be completed by 2007.

NOTE 1 – This activity should be coordinated with other Study Groups in particular with ITU-T Study Group 2 and ITU-D Study Group 2

Category: S1

II. United Nations Economic and Social Commission for Asia and the Pacific

Background

1. The Regional Space Applications Programme for Sustainable Development for Asia the Pacific (RESAP) of the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP), places an emphasis on increased contributions of space technology for sustainable development and improved quality of life in Asia and the Pacific, and disaster management has been one of its priorities. It does this through policy research and advocating capacity building at the policy, institutional and technical levels, covering the fields of Earth observation and satellite communications. This mandate was given to RESAP by the first and second Ministerial Conferences on Space Applications for Sustainable Development in Asia and the Pacific, held in Beijing and New Delhi in 1994 and 1999, respectively, as well as by the sessions of ESCAP.

2. Space applications for disaster management is a topic addressed by ESCAP using both sectoral and multi-sectoral approaches. In addition to the major contributory fields of Earth observation and satellite communications, the issue of disaster management is also addressed through the applications of space-based distance education, tele-health and the empowerment of people through community e-centres. ESCAP is currently preparing for the third Ministerial Conference on Space Applications for Sustainable Development, scheduled for 2007, at which a major review of space technology developmental priorities will take place. The use of space technology for disaster management will be one of the focus areas.

3. Since 2002, a series of activities have been organized by the ESCAP secretariat on the use of space technology for disaster management under RESAP. Those activities are part of the goal of ESCAP to help prepare the region for pursuing the development of improved regional cooperative mechanisms for disaster management, incorporating, but not limiting to, space technology. This topic has also been the main focus of three regional working groups of RESAP in the past years. With substantial financial support from France, Japan and the Republic of Korea, and in-kind contribution from the People's Republic of China, India, Indonesia, Malaysia, Singapore and Thailand, these activities discussed broad technical, institutional and policy issues related to the operational use of space-based information in effective disaster management practice.

4. The ESCAP secretariat is planning to organize meetings on disaster management communications through partnership with organizations such as the Asia-Pacific Satellite Communications Council (APSCC) and the International Telecommunication Union (ITU). It is also promoting and supporting the Tampere Convention, which recently entered into force for the development and affordable/sustainable implementation of deployable satellite communcations-enriched disaster response capabilities. ESCAP believes that each country would benefit from having disaster management emergency communication capacities, and the fact that satellite-enhanced deployable systems have demonstrated their capabilities for supporting response activities to the recent tsunami and earthquake disasters in Asia and the hurricane disasters in North and Central America. ESCAP is working with others to help countries establish such capacities.

5. In the context of bridging the digital divide, ESCAP is placing emphasis on satellite-connected community e-centres to support information and communication technologies (ICT) services and development oriented applications and to enable accessible, affordable and useful services to under-serviced areas using satellite and terrestrial networks. Some of the applications that could be serviced by satellite broadband are distance education, telemedicine and disaster

management including specialized weather forecasts (such as those that can benefit small fishing boats in coastal waters).

6. ESCAP has been promoting the integration of disaster management in development planning, the use of space technology in operational disaster management and the development of improved regional cooperative mechanisms in space technology applications for disaster management. Under the project "Capacity-building for disaster management in Asia and the Pacific", funded by the Government of France, ESCAP organized a series of regional workshops and consultations to promote regional cooperative mechanisms in space technology applications for disaster management.

7. Regional cooperative mechanisms have been one of the major agenda items of RESAP. The World Conference on Disaster Reduction (WCDR), which was held in Kobe, Japan, in January 2005, set in motion a collective vision to mitigate natural disasters by mainstreaming sustainable development, multi-hazard prevention strategies and institutional infrastructure for early warning systems.

8. As part of the ESCAP regional strategy on disaster reduction, RESAP intends to place more emphasis on disaster management and on developing national and regional capacity in the coming years in order to: (i) assess hazard/risk; (ii) promote preparedness and risk reduction; (iii) establish and multi-task national and regional warning and response systems; (iv) facilitate community-based disaster reduction; and (v) develop linkages to other United Nations and regional initiatives related to disaster management using space technology. It is necessary to recognize risk assessment as the central focus of setting up regional/sub-regional networks. A disaster reduction strategy will be addressed as part of an overall sustainable development strategy, as has been emphasized by the Millennium Development Goals (MDGs), the World Summit on Sustainable Development (WSSD) and the Hyogo Framework for Action.

9. ESCAP, in collaboration with the United Nations Office for Outer Space Affairs, ITU and APSCC, designed and disseminated an ongoing survey on satellite broadband resources in the Asia and Pacific region.

10. ESCAP is also preparing an update of regional inventory on space application capabilities, facilities and initiatives in Asia and the Pacific.

11. ESCAP supports the Scientific and Technical Subcommittee's work on the establishment of a global system to manage natural disaster mitigation, relief and prevention, as recommended in the Vienna Declaration. An ad hoc expert group, consisting of experts from interested member States of the Committee on the Peaceful Uses of Outer Space and relevant international organizations, had been established, as recommended in paragraph 9 of General Assembly resolution 59/2, to conduct a study on the possibility of creating an international entity to provide for coordination and the means of optimizing the effectiveness of space-based services for use in disaster management. ESCAP also supports the view expressed that a disaster management international space coordination entity should be established under the aegis of the United Nations system:

- for the rapid dissemination of information on the latest results of research and development in the use of satellite derived data; and
- information for earthquake prediction should be included in the scope of the disaster management international space coordination entity.

12. ESCAP has recognized the importance of standardized products and services derived from space-based platforms in operational disaster management. In this connection, the project on Enhanced national capacity in policy making on natural disaster management using information, communication and space technologies was initiated in mid-2004, with financial support from the Republic of Korea. The aim of the project is to strengthen national capacities for policy-making in disaster management and the effective integration of space information products and services, with operational disaster management, focusing particularly on floods and drought. The expected outputs of the project are a regional framework for policy formulation at the national level for regional cooperation, and relevant guidelines to facilitate operational provision and utilization of products and services for informed disaster management.

13. In many cases several products and free services are already available for various purposes. Sometimes a single product is useable for multiple purposes by user communities ranging from researchers, authorities and the general public, to practitioners and educators. Most users prefer standardized, well-processed, user-friendly (easy-to-understand and –use) specific products obtained from definitive satellite resources (Earth observation, meteorological and scientific) but at convenient locations (e.g. "one-stop" Web portals). However, often space-derived information remains in a space-centric (rather than in a user-friendly) culture of industry-friendly (but not user-friendly) formats, from a plethora of locations inconvenient to the user. Indeed, competing products may exist from various sources, with little user-friendly guidance on the relative usability (or possible pitfalls) of various available options. Also, many space-based products are prototypes, not always reliably available when users need them.

14. In order to meet the demands of the member countries and decisions taken at the meetings of the Intergovernmental Consultative Committee (ICC), ESCAP has taken the initiative in this field to develop a project on *Standardized satellite derived products and services for disaster managers*. It may be implemented starting in 2006.

15. At its fifty-ninth session from 1 to 4 September 2003, ESCAP recommended that the secretariat initiate preparations for the Third Ministerial Conference on Space Applications for Sustainable Development in Asia and the Pacific and consider steps towards an institutional framework for regional space applications and development. At its sixtieth session, from 22 to 28 April 2004, the Commission agreed to organize the conference in 2007, the year that marks the 50th commemoration of the beginning of the space age with the launch of the first satellite Sputnik. The regional cooperative mechanisms in major space applications fields will be one of the major topics to be discussed at the Conference, in particular for disaster management. Establishing regional cooperative mechanisms in space technology applications in fields such as disaster management (e.g. *mechanisms for delivering data at near-real-time*), satellite communication services, as well as to address appropriate policies to ensure cost-effective access to ICT and space-based data, products and services equitably in the region.

16. As part of the preparation process for the Third Ministerial Conference, ESCAP will be collating information on the space-based capabilities of the countries in the region via inputs from all stakeholders including countries, satellite operators and service providers.

Workshops

17. ESCAP participated in several relevant meetings in and out of the region, including the WCDR; the meeting hosted by Thailand in Phuket on 28 and 29 January 2005 to discuss regional early warning centre development; several meetings of the Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific and Cultural Organization (UNESCO)

and the International Strategy for Disaster Reduction (UNISDR); and the Asia-Pacific Regional Space Agency Forum (APRSAF) Technical Workshop on "Disaster Reduction through Effective Space Technology Utilization in the Asia Pacific Region", which was held in Kuala Lumpur from 24 to 26 May 2005.

18. As a response to the 26 December 2004 Tsunami disaster, ESCAP organized a High-level Expert Group Meeting on Technical Options for Disaster Management Systems: Tsunamis and Others, which was held in Bangkok from 22 to 24 June 2005. The Meeting brought together national and regional disaster management officials and technical experts on disaster management systems. These two groups, which often meet in separate circles, were thus able to share their concerns and thoughts on how disaster management (including tsunami early warning) could be optimized for the region, to benefit at-risk countries and communities. Recommendations included the holding of a meeting on disaster management communications (see paragraph 3), investigating the development of a series of workshops to develop and disseminate "standard operating procedures" on various aspects of disaster management. The full report can be found on the ESCAP Website at:
http://www.unescap.org/icstd/events/egm_dms/index.asp.

19. Under the project noted in paragraph 6, the Meeting of Experts on Space Applications for Disaster Management, held in Chiang Mai, Thailand, from 25 to 28 July 2005, took into account the interests/commitments of relevant countries and institutions and other mechanisms put in place by various regional initiatives and recommended a framework, strategy and plan of action towards integrating space technology applications in disaster management and modalities of regional cooperative mechanisms. In order to enable the proposed framework, the meeting recommended the following strategies and follow-up actions:

(a) strengthening national risk assessment capabilities;
(b) integrating space technology applications in early warning systems;
(c) promoting a forum of Earth observation satellite operators for disaster management;
(d) promoting emergency communication that is based on communication satellites;
(e) promoting space-based products and services for disaster management;
(f) promoting local intermediary organizations;
(g) promoting rural information centres as community-based disaster risk reduction hubs;
(h) harnessing the support of the International Charter "Space and Major Disasters" to help the least developed countries;
(i) synergizing United Nations and regional initiatives in the Framework of Cooperative Mechanisms;
(j) fostering public-private partnerships; and
(k) using remote sensing/geographic information systems (GIS) in the Universalizing Impact Assessment Methodology.

20. Under the project noted in paragraph 12, the Meeting of Experts on Policy Framework on Space Information Products and Services for Disaster Management was jointly organized by ESCAP and the National Remote Sensing Center of China (NRSCC) in Beijing, from 17 to 19 November 2004. The meeting was hosted by the China Secretariat of the Committee on Earth Observation Satellites (CEOS) and the Beijing Normal University. It was held back-to-back with the CEOS 18th Plenary and in conjunction with the CEOS International Workshop on Earth Observation Technology and Application, which was organized in Beijing by the NRSCC, in its capacity as the Chair Agency of CEOS for 2004. The meeting was attended by space information service providers and end-users of disaster management authorities, aiming to analyze the

situation and needs in the region for space information products and services for disaster management, discuss common end-user requirements in space-based information products and services, recommend means to meet those requirements and identify major policy issues to be addressed through regional cooperative mechanisms.

21. ESCAP took part in the organization and implementation of the Asian Conference on Disaster Reduction, held in Beijing, from 27 to 29 September 2005.

Fellowships

22. ESCAP has long realized that it is important to increase the opportunities for focused mid-term training in all areas of space technology applications and urged members and associate members to make such opportunities available at their relevant institutions. Training support is an established part of RESAP, and of the overall project by ESCAP entitled "Technical Cooperation Among Developing Countries". Under that project, courses developed in a developing country for its nationals can be enriched by international participation through fellowships. Under the scheme, which is coordinated between the training programme and ESCAP, the latter pays the international travel expenses to the qualified training site, and the training hosts cover local expenses for those selected participants who receive travel support from ESCAP. Several hundred people from the region have been trained in such a manner, in various aspects of space technology for development.

23. In collaboration with the National Coordinating Agency for Surveys and Mapping (BAKOSURTANAL) of Indonesia, ESCAP had offered eleven 2-month fellowships for trainees from least developed countries, which are identified as priority countries by ESCAP, for a mid-term study in applications of remote sensing and GIS for natural disaster management.

24. In collaboration with the Centre for Space Science and Technology Education in Asia and the Pacific affiliated to the United Nations, ESCAP has offered ten 12-month fellowships for 2005 for postgraduate studies in satellite communications. The course includes components on mobile disaster communications, remote sensing and GIS-related applications and disaster management.