



**Committee on the Peaceful
Uses of Outer Space****Technical advisory support activities carried out in 2012 in
the framework of the United Nations Platform for
Space-based Information for Disaster Management
and Emergency Response****Report of the Secretariat***Summary*

The present report provides a summary of the implementation of activities carried out in 2012 by the United Nations Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER) programme, specifically in the area of technical advisory support and support for emergency response as determined in the workplan for the biennium 2012-2013.

In 2012, the UN-SPIDER programme reached the established target by providing technical advisory support to 25 countries, in the form of technical advisory missions to 5 countries, continuing support for 11 countries supported in the previous biennium and support for 9 new countries. In addition, 5 countries were supported during emergencies.

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I. Introduction

1. In its resolution 61/110, the General Assembly decided to establish the United Nations Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER) as a programme within the United Nations to provide universal access for all countries and all relevant international and regional organizations to all types of space-based information and services relevant to disaster risk management to support the full disaster management cycle and agreed that the programme should be implemented by the Office for Outer Space Affairs of the Secretariat.
2. At its fiftieth session, the Committee on the Peaceful Uses of Outer Space agreed that progress reports on UN-SPIDER and its future workplans should be considered by the Scientific and Technical Subcommittee under a regular agenda item on space-system-based disaster management support and that the agenda item should be included in the list of issues to be considered by its Working Group of the Whole.
3. The present report provides a summary of the implementation of activities carried out in 2012 by the UN-SPIDER programme, specifically in the area of technical advisory support and support for emergency response as determined in the workplan for the biennium 2012-2013.

II. Technical advisory support activities carried out in 2012

4. Through the UN-SPIDER programme, in 2012 the Office for Outer Space Affairs of the Secretariat worked with Member States that requested support in accessing and using space-based solutions for disaster risk management and emergency response. That support included:
 - (a) Assessments of national capacity and evaluations of disaster and risk reduction activities, policies and plans with regard to the use of space-based technologies;
 - (b) Assistance in the design of risk reduction and disaster risk management plans and policies with regard to the use of space-based technologies;
 - (c) Development and customizing of guidelines and templates for including space-based technologies in disaster risk reduction and emergency response;
 - (d) Facilitation of access for national institutions to space-based information to support disaster risk reduction and emergency response activities;
 - (e) Identification of training needs and facilitation of the implementation of capacity-building activities;
 - (f) Support for the implementation of risk reduction and emergency response activities using space-based technologies.
5. Technical advisory support is one of the prime activities of the UN-SPIDER programme at the national level and is aimed at providing Member States with the forms of support described in paragraph 4. It can include: (a) technical advisory missions involving experts from space and disaster management agencies from

other countries as well as from relevant international and regional organizations and institutions; (b) technical advice to national institutions by means of meetings, teleconferences, videoconferences etc.; (c) facilitating direct cooperation between national institutions and providers of space-based information and solutions; and (d) facilitating access to satellite images during emergencies.

6. Since disaster risk management calls for interventions from several sectors, a mission team, when carrying out a technical advisory mission, looks into diverse areas, including data access and policy, information management, national spatial data infrastructure and institutional coordination.

7. The output of each mission is a formal report with a summary of the findings, recommendations, follow-up actions and suggestions on guidelines and policies on disaster risk management issues, always from the perspective of the use of space-based information in all stages of disaster management. Those reports are shared with the requesting Member State, as well as with the other institutions involved in the technical advisory mission. The mission report often provides valuable input to the United Nations country offices involved in disaster management in the country.

8. In 2012, the UN-SPIDER programme reached the established target by providing technical advisory support to 25 countries, in the form of technical advisory missions to 5 countries (Cape Verde, Mozambique, Myanmar, Solomon Islands and Tonga), continuing support to 11 countries supported in the previous biennium (Bangladesh, Burkina Faso, Cameroon, Fiji, Ghana, India, Malawi, Nigeria, Samoa, Sri Lanka and Sudan) and support for 9 new countries (Burundi, Chad, Congo, Democratic Republic of the Congo, Gabon, Indonesia, Kenya, Lao People's Democratic Republic and Vietnam).

9. In addition, five countries were supported during emergencies (floods in China, earthquake in Costa Rica, volcanic eruption in Guatemala, earthquake in Iran (Islamic Republic of), and floods in Fiji).

10. Summaries of the findings and recommendations contained in the reports of the five technical advisory missions carried out in 2012 have been included in the annex to this report.

A. Africa

11. The African continent faced an increasing number of natural disasters in 2012, mostly involving droughts and floods. Apart from causing humanitarian distress, such disasters also exacerbate other risks, such as disease, which in turn aggravate an already tense situation.

12. UN-SPIDER tries to mitigate such consequences by connecting national institutions with the space industry in order to improve various phases of the disaster management cycle, particularly the disaster response phase. Coastal areas are especially vulnerable to various disasters, which is why UN-SPIDER focused its technical advisory missions on such areas.

13. During the biennium 2010-2011, UN-SPIDER provided support to the following countries in Africa: Burkina Faso, Cameroon, Madagascar, Malawi,

Mozambique, Namibia, Nigeria, Sudan and Togo. In 2012, UN-SPIDER continued supporting the region by supporting 14 countries (Burkina Faso, Burundi, Cameroon, Cape Verde, Chad, Congo, Democratic Republic of the Congo, Gabon, Ghana, Kenya, Malawi, Mozambique, Nigeria and Sudan); full-fledged technical advisory missions were carried out in two of those countries (Cape Verde and Mozambique).

14. At the request of the Government of Mozambique, UN-SPIDER conducted a technical advisory mission to that country from 8 to 12 October 2012. More than half of Mozambique's population lives in areas near the coast, making them highly vulnerable to cyclones and storms. Mission outcomes are described in the annex to the present report.

15. At the request of the Government of Cape Verde, UN-SPIDER carried out a technical advisory mission to that country from 30 July to 3 August 2012 to evaluate the current and potential use of space-based information in all aspects of disaster management. Mission outcomes are described in the annex to the present report.

16. Following the UN-SPIDER technical advisory mission at the request of the Government of the Sudan (through its Remote Sensing Authority) in June 2011, UN-SPIDER supported the participation of experts from the Sudan Remote Sensing Authority and officials of the Sudan national civil protection department in workshops and training programmes that it organized or supported. One person from the Sudan participated in the training programme on space technology for drought monitoring in Africa and Asia held in Beijing.

17. On the basis of the recommendation of the technical advisory mission to Cameroon in June 2011, UN-SPIDER supported training in remote sensing for disaster management, at the request of the UN-SPIDER national focal point for Cameroon. The training was conducted from 7 to 11 May 2012, jointly with the United Nations University Institute for Environment and Human Security. Some 25 participants from the Ministry of Territorial Administration and Decentralization and various other ministries and universities attended the training.

18. As a follow-up to the UN-SPIDER technical advisory mission in June 2011, at the request of the Government of Nigeria (through the National Emergency Management Agency), technical meetings were held for stakeholders to assist in the mainstreaming of space technologies in disaster management. This resulted in the sufficient activation of the Charter on Cooperation to Achieve the Coordinated Use of Space Facilities in the Event of Natural or Technological Disasters (also called the International Charter on Space and Major Disasters) to manage the flood disaster in Nigeria in 2012. Furthermore, participants from the National Emergency Management Agency and the National Space Research and Development Agency of Nigeria were offered one week of training on drought monitoring in Beijing.

19. The capacity-building and training programme "Space technology for drought monitoring in Africa and Asia" was held in Beijing from 11 to 16 November 2012, jointly organized by UN-SPIDER and the National Disaster Reduction Centre of China with support from the Capital Normal University of China. Officials from eight African countries (Burkina Faso, Cameroon, Ghana, Kenya, Malawi, Mozambique, Nigeria and Sudan) participated. Through the training programme, UN-SPIDER continued working with countries where technical advisory support

had been conducted in recent years. Mission outcomes are described in the annex to this report.

20. UN-SPIDER continued to coordinate closely with and build upon the expertise and capabilities of its established regional support offices in Africa: the Algerian Space Agency, the National Space Research and Development Agency of Nigeria and the Regional Centre for Mapping of Resources for Development, based in Nairobi. In addition, there was close coordination with the Economic Commission for Africa, the United Nations Development Programme (UNDP), the regional offices of the Office for the Coordination of Humanitarian Affairs of the Secretariat and the secretariat of the International Strategy for Disaster Reduction.

B. Asia and the Pacific

21. In 2012, UN-SPIDER provided support to seven countries in Asia (Bangladesh, India, Indonesia, Lao People's Democratic Republic, Myanmar, Sri Lanka and Viet Nam) and five countries in the Pacific region (Fiji, Samoa, Solomon Islands, Tonga and Vanuatu), including through technical advisory missions to Myanmar, Solomon Islands and Tonga. With the ongoing support of the Government of Austria, UN-SPIDER was able to lay special emphasis on small islands in the Pacific region, hence the technical advisory missions to Tonga and Solomon Islands and advisory support to Vanuatu.

22. At the request of the Government of Myanmar, through the Ministry of Social Welfare, Relief and Resettlement, UN-SPIDER carried out a technical advisory mission to Myanmar to evaluate the current and potential use of space-based information in all aspects of disaster management and to strengthen disaster risk management in the country by providing better access to space-based information for disaster risk reduction and response. Mission outcomes are described in the annex to the present report.

23. In March 2012, the UN-SPIDER programme provided support to Tonga through a technical advisory mission, at the request of the Government of Tonga through the Ministry of Lands, Survey and Natural Resources. Tonga faces various types of disaster every year, including earthquakes, volcanoes, cyclones and other coastal hazards such as storm surges, sea-level rise and even tsunamis. Mission outcomes are described in the annex to the present report.

24. In September 2012, at the request of the Government of Solomon Islands, through its National Disaster Management Office, UN-SPIDER carried out a technical advisory mission to evaluate the current and potential use of space-based information in all aspects of disaster management and to strengthen disaster risk management in the country by providing better access to space-based information for disaster risk reduction and response. Mission outcomes are described in the annex to the present report.

25. At the invitation of the head of the Vanuatu National Disaster Management Office, a UN-SPIDER expert mission for technical support to Vanuatu was carried out from 27 to 30 October 2012 to meet with various national institutions and discuss potential opportunities regarding the use of space-based technologies and solutions to support disaster risk management.

26. In follow-up to its technical advisory missions to Bangladesh, Sri Lanka, Myanmar and Solomon Islands in 2011 and 2012, UN-SPIDER sponsored one official from each of those countries for a one-month training programme on space technology applications in disaster risk reduction at the Centre for Space Science and Technology Education in Asia and the Pacific, Dehra Dun, India, from 9 April to 4 May 2012.

27. UN-SPIDER supported a training workshop on the topic “Space technology for disaster risk management and emergency response” at the National Institute of Disaster Management, New Delhi, from 2 to 4 April 2012. The third such training workshop organized jointly by the National Institute of Disaster Management and UN-SPIDER, it brought together 25 key participants and resource persons. Mission outcomes are described in the annex to the present report.

28. As a follow-up to the technical advisory mission to Sri Lanka (17-21 October 2011), a four-day capacity-building training course was held, jointly organized by the Disaster Management Centre of Sri Lanka and UN-SPIDER, with support from Uva Wellassa University of Sri Lanka, UNDP in Sri Lanka and the National Disaster Reduction Centre of China. The course was conducted by experts from United Nations agencies, regional organizations, national agencies and institutions, the private sector and universities. About 24 participants involved in disaster management and hazard mapping in Sri Lanka participated. Mission outcomes are described in the annex to the present report.

29. The capacity-building programme on the topic “Space technology for drought monitoring in Africa and Asia” was held in Beijing from 11 to 16 November 2012, jointly organized by UN-SPIDER and the National Disaster Reduction Centre of China with support from the Capital Normal University of China. Officials from five countries from the Asia-Pacific region (Fiji, Indonesia, Lao People’s Democratic Republic, Samoa and Viet Nam) participated. Through the training programme, UN-SPIDER continued working with countries where technical advisory support had been conducted in recent years. Mission outcomes are described in the annex to the present report.

30. In carrying out its work in the Asia-Pacific region UN-SPIDER coordinates closely with and builds upon the expertise and capabilities of the established regional support offices in the region: the Iranian Space Agency, the Pakistan Space and Upper Atmosphere Research Commission and the Asian Disaster Reduction Center, which is based in Kobe, Japan. Those regional support offices participated and contributed to several events organized by UN-SPIDER. Publications are planned jointly with the UN-SPIDER regional support offices in the Asia-Pacific Region, as follows: (a) the Asian Disaster Reduction Center is working on a booklet on the effective use of space-based information to assess tsunami impact; (b) the Pakistan Space and Upper Atmosphere Research Commission is working on a booklet on the effective use of space-based information to monitor massive flood disasters and their impact; and (c) the Iranian Space Agency is working on a booklet on the effective use of space-based information to assess drought at the national level.

C. Latin America and the Caribbean

31. Starting in 2009 UN-SPIDER began to find ways to provide technical advisory support to Central America, either facilitating the activation of international mechanisms such as the International Charter on Space and Major Disasters; facilitating access to imagery provided by the Water Center for the Humid Tropics of Latin America and the Caribbean (CATHALAC), based in Panama City; the National Disaster Reduction Centre of China or the German Aerospace Center (DLR); or providing support through technical advisory missions and capacity-building activities.

32. Between 2009 and 2012, UN-SPIDER provided technical support in cases of disaster to Guatemala, El Salvador, Costa Rica and Panama. In 2012, such support went to Guatemala, which faced the consequences of a volcanic eruption in September and of an earthquake in November, and to Costa Rica, which suffered the impact of an earthquake in September.

33. In 2012, the National Commission on Space Activities (CONAE) of Argentina signed a cooperation agreement with UN-SPIDER to become a regional support office. CONAE joins CATHALAC in Panama, Augustín Codazzi Geographical Institute in Colombia and the University of the West Indies in Trinidad and Tobago as a regional support office for Latin America and the Caribbean. In addition, efforts were made to discuss the possibility of technical advisory missions to Chile and El Salvador, which will be carried out once financial resources are secured for such missions.

34. In 2012 no support activities were conducted with regard to five countries in the region that had been supported in the previous biennium (Chile, Dominican Republic, Ecuador, Haiti and Jamaica) owing to lack of funding support from donor countries.

D. Small island developing States

35. Small island developing States are particularly prone to major disasters, and in general the regional and national capacities to use space-based solutions for disaster management require further enhancement. The continued support of the Austrian Federal Ministry for European and International Affairs for activities conducted by UN-SPIDER in support of small island developing States has allowed the programme to ensure long-term and sustainable support for those countries.

36. The UN-SPIDER programme has been providing increasing support to small island developing States since it first began targeting that group of countries in 2008 with the organization of regional workshops in both the Caribbean and the Pacific regions. That led to additional activities, including technical advisory missions to the Dominican Republic, Fiji, Haiti, Jamaica, Maldives, Samoa, Solomon Islands and Tonga, as well as supporting experts from national disaster management organizations from those countries to attend relevant meetings.

37. Specifically for the Pacific region, UN-SPIDER continued providing support to the Governments of Fiji, Samoa, Solomon Islands, Tonga and Vanuatu. While technical advisory missions were conducted to Solomon Islands and Tonga in 2012,

the UN-SPIDER programme supported the participation of an expert from the Disaster Management Offices of Fiji and Samoa to attend a UN-SPIDER conference in Beijing and an international training programme on drought monitoring.

III. Support for emergency response

A. Building upon existing mechanisms and opportunities

38. The UN-SPIDER programme has arrangements in place with several leading global and regional initiatives, including the International Charter on Space and Major Disasters (the Office for Outer Space Affairs has been a cooperating body of the Charter since 2003), Sentinel Asia (the Office for Outer Space Affairs is a member of the Joint Project Team) and the Services and Applications for Emergency Response project of the Global Monitoring for Environment and Security initiative. Additionally, UN-SPIDER works to promote and leverage the opportunities provided by the Mesoamerican Regional Visualization and Monitoring System nodes in Latin America and Africa.

39. Additionally, UN-SPIDER has worked with the National Disaster Reduction Centre of China since 2011. In 2012, the Centre and UN-SPIDER have developed collaboration with several organizations in Africa to monitor drought in that continent.

40. Similarly, UN-SPIDER has been able to channel support from various other providers of satellite resources, such as space agencies and the private sector.

41. In providing support to countries, the UN-SPIDER programme ensures the involvement of the UN-SPIDER regional support offices and other centres of excellence to support the analysis of the space-based data being made available.

B. Support provided in 2012

42. In 2012, the activation of the International Charter on Space and Major Disasters by the Office for Outer Space Affairs was requested three times on behalf of the regional office for Asia and the Pacific of the Office for the Coordination of Humanitarian Affairs of the Secretariat — for Fiji because of floods in March and for Palau and the Philippines because of Typhoon Bopha in December — and once for the Iranian Space Agency (a UN-SPIDER regional support office) for the Islamic Republic of Iran because of the earthquake in August.

43. In Guatemala, as a consequence of the Fuego volcanic eruption on 13 September 2012, UN-SPIDER facilitated the link between the National Coordinating Agency for Disaster Reduction of Guatemala (CONRED) and CONAE of Argentina, leading to the activation of the International Charter on Space and Major Disasters.

44. Furthermore, after the south-western region of Guatemala suffered the impact of a strong earthquake on 7 November 2012, UN-SPIDER supported CONRED in its activation of the International Charter on Space and Major Disasters through CONAE. The network of regional support offices was also activated to provide additional support. In that activation, the International Charter on Space and Major

Disasters opted to nominate CONRED and the technical, inter-institutional remote sensing group for risk and disaster management as project managers. The technical group had been established formally in June 2012 through a memorandum of understanding among five government agencies, as recommended by UN-SPIDER during its technical advisory mission to Guatemala in November 2010.

45. In the case of Costa Rica, following the earthquake on 5 September 2012, UN-SPIDER requested the provision of technical support through its network of regional support offices in Argentina, Colombia and Panama.

46. In China, multiple earthquakes struck the mountainous rural regions of Yunnan and Guizhou in south-west China on 7 September 2012, killing at least 80 people and injuring more than 160 others. At the request of the National Disaster Reduction Centre of China, UN-SPIDER immediately requested the National Remote Sensing Centre (NRSC) of the Indian Space Research Organisation (ISRO) and DigitalGlobe to obtain high-resolution satellite images of the affected area. The prompt action of UN-SPIDER helped ISRO and DigitalGlobe to plan action on the same day and to collect the images on the following day.

47. A total of 56 images were provided to China through the UN-SPIDER request one day after the event to assess the impact of the earthquake. Of the 56 images, 12 were pre-disaster and 44 were post-disaster. NRSC/ISRO images were uploaded through UN-SPIDER FTP and NRSC FTP. DigitalGlobe created a Cloud Services evaluation account for UN-SPIDER to provide access to the pre- and post-earthquake images.

Annex

Technical advisory missions and other support activities carried out in 2012 in the framework of the United Nations Platform for Space-based Information for Disaster Management and Emergency Response

A. Cape Verde

1. At the invitation of the Ministry of Internal Administration and its National Civil Protection Service, UN-SPIDER carried out a technical advisory mission to Cape Verde from 30 July to 3 August 2011. The mission team comprised 12 experts from UN-SPIDER, the Regional Centre for Training in Aerospace Surveys, the interdisciplinary Centre of Competence for Geoinformatics of the University of Salzburg, Austria, the European Commission, the Secure World Foundation, the National Space Research and Development Agency of Nigeria, the National Institute for Space Research of Brazil, Cloneshouse Nigeria, the International Network of Crisis Mappers, the University of the Azores (Portugal) and the New University of Lisbon.

2. Meetings were held with key stakeholders within the Government, associated departments and agencies and United Nations offices. In total, 11 different institutions were consulted: the National Civil Protection Service, the Instituto Nacional de Meteorologia e Geofísica, the Directorate General of Environment, the Unidade de Coordenação do Cadastro Predial, the Direcção Geral de Ordenamento do Território e Desenvolvimento Urbano, the Operational Nucleus for the Information Society, the National Institute for Agricultural Research and Development, the National Communications Agency, the National Statistical Office, the University of Cape Verde and the United Nations Development Programme (UNDP). In addition, UN-SPIDER and the National Civil Protection Service, together with UNDP, organized a one-day workshop on 2 August 2012 bringing together more than 45 representatives from various government and United Nations agencies and educational institutions of the country to discuss cross-cutting issues related to the use of geographic and space-based information for disaster risk reduction and emergency response.

3. The key observations and recommendations of the advisory mission were as follows:

(a) The national platform for disaster risk reduction should be strengthened, possibly by having a technical inter-institutional team within the national platform focused on coordinating the use and access of geospatial information;

(b) There should be policy interventions to define clear cooperation and a data- and information-sharing mechanism between different national institutions. The status of the establishment of a national spatial data infrastructure should be reviewed;

(c) The conversion of hazard and susceptibility maps into meaningful risk profiles requires integration with data from multiple resources (spatial, socioeconomic etc.). An appropriate methodology and concept to integrate Earth

observation, spatial data and additional socioeconomic data into a vulnerability assessment should be proposed and maintained. The assessment of risk should be a mandatory fundamental component of any land management plan to be developed and approved at the municipal, island or special (protected area, watershed, coastal zone, etc.) geographic level;

(d) Specific training requirements of offices involved in national risk profiling and early warning, as well as the strengthening of the technical infrastructure of departments involved in disaster risk management for analysis of satellite data and processing of geospatial information, along with human capacities, should be identified. A critical mass of officials should be trained in all stakeholder departments, both providers and end users.

B. Mozambique

4. At the request of the Government of Mozambique, through the National Institute for Disaster Management, UN-SPIDER carried out a technical advisory mission to evaluate the current and potential use of space-based information in all aspects of disaster management and to strengthen disaster risk management in the country.

5. The mission team comprised nine experts from UN-SPIDER, the University of Salzburg, Austria, the Center for Interdisciplinary Geospatial Information Technologies, United States of America, the Institute for Technology and Resources Management in the Tropics and Subtropics, Cologne University of Applied Sciences, the Southern African Development Community, Umvoto Africa (Pty) Ltd, and the Southern Mapping Company, South Africa. The mission team visited the following offices during the first three days: the National Institute for Disaster Management, the Directorate for the Development of Arid and Semi-Arid Zones, the National Emergency Operations Centre, the Ministry of Agriculture, the National Directorate for Agrarian Services, the National Centre for Cartography and Remote Sensing, the National Directorate for Land and Forests, the Institute for Agrarian Research of Mozambique, the Famine Early Warning Systems Network, the National Institute of Meteorology, the Regional Water Administration (South), the National Statistics Institute, the Ministry for the Coordination of Environmental Affairs, the National Directorate for Environmental Management, the National Directorate for Territorial Planning, Eduardo Mondlane University and the Technical University of Mozambique. The key recommendations were as follows:

(a) *Policy and coordination.* (i) Update the disaster management and contingency plans to incorporate space-based information; (ii) make policy interventions to define clear cooperation and information-sharing mechanisms between data-provider organizations and user organizations; (iii) spatial data infrastructure should be taken up as a top priority to avoid a huge waste of resources and to share international best practices;

(b) *Data status, availability and access.* (i) Create and implement infrastructure for sharing data; (ii) the national geodetic reference system needs to be improved and awareness regarding the use of open-source software and open data should be strengthened;

(c) *Information-sharing.* (i) The National Institute for Disaster Management should develop a capability to access existing mechanisms (International Charter on Space and Major Disaster, Mesoamerican Regional Visualization and Monitoring System, etc.) and use them effectively; (ii) there should be a right to data access to address comprehensive needs and to strengthen the effective functioning of the National Institute for Disaster Management; (iii) data access among governmental institutions should be considered a top priority;

(d) *Capacity-building.* (i) Stakeholders of the National Institute for Disaster Management (members of the Disaster Management Council) should receive on-the-job training in specific skills; (ii) national capacity should be developed to generate a critical mass of trained personnel; (iii) there should be a forum to generate awareness and to engage various levels of decision makers.

C. Myanmar

6. At the request of the Minister for Social Welfare of Myanmar, a joint technical advisory mission to Myanmar was conducted by the Office for the Coordination of Humanitarian Affairs of the Secretariat and led by the United Nations Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER) from 19 to 23 March 2012. The mission team, under the leadership of UN-SPIDER, comprised nine experts from UN-SPIDER, the Economic and Social Commission for Asia and the Pacific, the United States Geological Survey Earth Resources Observation and Science Center, the Geoscience and Remote Sensing Society of the Institute of Electrical and Electronics Engineers, the Centre for Space Science and Technology Education in Asia and the Pacific, the Asia-Pacific Space Cooperation Organization, the National Disaster Reduction Centre of China and Mekong Consultant Co. Ltd.

7. The mission visited a number of ministries and government agencies, including the Relief and Resettlement Department, the Myanmar Disaster Preparedness Agency, the Forest Department, the Department of Meteorology and Hydrology, the Ministry of Science and Technology, the Mandalay Technological University, the Myanmar Engineering Society, the Disaster Risk Reduction Working Group, the Fire Service Department and the Myanmar survey department. As part of the technical assistance mission, the workshop on the topic “Application of space technology for disaster risk reduction” was held on 22 March 2012 at Nay Pyi Taw and was attended by more than 50 key officials.

8. The mission report provides critical inputs to the Relief and Resettlement Department and its stakeholders to leverage existing resources and develop further capacity for making effective use of space technology for disaster management, which is critical for reducing human and financial losses caused by disasters. Following are the key observations and recommendations of the advisory mission:

(a) The Relief and Resettlement Department should interface with the Department of Meteorology and Hydrology, the Department of Remote Sensing of Mandalay Technological University of the Ministry of Science and Technology, the Forest Department and other stakeholders who use space and geospatial information;

(b) The Relief and Resettlement Department should be equipped with infrastructure to handle remote sensing and geographic information systems (GIS) for its own purposes, including GIS datasets containing all baseline and thematic data that should be obtained from relevant departments in the country;

(c) The existing international and regional cooperation mechanisms are in place and may be activated to get satellite data and products for Myanmar in the event of a major disaster. This includes Sentinel Asia and the Charter on Cooperation to Achieve the Coordinated Use of Space Facilities in the Event of Natural or Technological Disasters (also called the International Charter on Space and Major Disaster);

(d) The Myanmar Action Plan on Disaster Risk Reduction listed a large number of activities requiring up-to-date hazard, vulnerability and risk assessments.

9. The report has taken in-depth account of gaps in coordination and provides recommendations to address those gaps.

D. Solomon Islands

10. At the request of the Government of Solomon Islands, through the National Disaster Management Office, UN-SPIDER carried out a technical advisory mission to evaluate the current and potential use of space-based information in all aspects of disaster management and to strengthen disaster risk management in the country by providing better access to space-based information for disaster risk reduction and response. The mission team visited the following offices during the first three days: the Ministry of Mines, Energy and Rural Electrification, the National Geographic Information Centre, the Ministry of Lands, Housing and Survey, the Statistics Division of the Ministry of Finance and Treasury, the School of Natural Resources, Solomon Islands College of High Education, the Marine Department, Ministry of Infrastructure and Development, the Solomon Islands Ports Authority, the Solomon Islands Water Authority, the Ministry of Agriculture and Livestock, the Solomon Islands Electricity Authority, the Ministry of National Planning and Aid Coordination, the United Nations Development Programme and the United Nations Children's Fund.

11. Those visits provided insight into roles in disaster management, with emphasis on space-based and geospatial information. A one-day workshop was attended by over 25 persons from government departments, United Nations agencies, non-governmental organizations and private companies involved in using geospatial technologies for disaster management. The key observations and recommendations were as follows:

(a) *Policies and procedures.* The National Disaster Management Office, through the National Disaster Council, could work out initiatives to promote flexible and policy-driven development for geospatial management, in which a broader range of mechanisms and policies set the guidelines against which all decision-making takes place with regard to disaster risk reduction and disaster management;

(b) *Institutional framework.* The National Disaster Management Office should take advantage of the established Hazards Committee under the National

Disaster Council Committees to establish mechanisms for the preparation and sharing of geospatial data, including space-based information;

(c) *Information, coordination and cooperation.* Data sources that meet the needs of the National Disaster Management Office exist in various agencies. The data sources must be traced and mapped. Individual projects cannot jointly generate the level of investment or standardized data essential to the broader user community, and the country has not offered incentives to agencies to participate in efforts for the coordination and sharing of data;

(d) *Capacity development.* An immediate capacity-development plan needs to be sketched out for the short, medium and long term. The Secretariat of the Pacific Community Applied Geoscience and Technology Division plays a critical role in this regard, and close consultation to develop a capacity-development road map for the National Disaster Management Office will boost current efforts. Annual workplans of the National Disaster Management Office could include the financial aspects of capacity-development issues and awareness-raising programmes. Regional centres such as the Centre for Space Science and Technology Education in Asia and the Pacific and the Asian Institute of Technology in Bangkok provide tailored courses.

E. Tonga

12. In March 2012, UN-SPIDER provided support to Tonga through a technical advisory mission, pursuant to a request by the Government of Tonga through the Ministry of Lands, Survey and Natural Resources. Tonga faces various forms of disaster every year, including earthquakes, volcanoes, cyclones and other coastal hazards such as storm surges, sea-level rise and even tsunamis.

13. The mission comprised meetings with different institutions and a half-day workshop to assess Tonga's capacities and to raise awareness regarding the advantages of space-based technologies, especially for disaster management and disaster risk reduction end users. Current policies, procedures and mechanisms related to the use of geospatial information were reviewed and the mission team recommended further steps, such as the creation of linkages to already existing mechanisms and the consolidation of an institutional and legal framework regarding geospatial data. The need to ensure data-sharing was also addressed.

14. Furthermore, strategy for institutional strengthening was developed and the mission team took the first step towards a long-term association with UN-SPIDER, so that national entities can take advantage of outreach activities, programmes and resources available through the UN-SPIDER network. Finally, the mission team recommended the organization of a capacity-building activity, which should include either a vulnerability mapping exercise or an emergency response simulation exercise, and the exploration of the possibilities of crowdsourcing initiatives.

F. Support for Member States based on recommendations for the technical advisory support

National training workshop on the topic “Space technology applications in disaster management and emergency response”, New Delhi, 2 to 4 April 2012

15. UN-SPIDER and the National Disaster Management Authority of India jointly supported a training workshop on the topic “Space technology applications in disaster management and emergency response” in New Delhi. The workshop was jointly organized by UN-SPIDER and the National Institute of Disaster Management. The event provided a platform for the State disaster management authorities and providers of space-based information to discuss systems, tools, technologies, products and best practices. The workshop brought together 25 key participants and resource persons. The outcomes will be circulated to State disaster management authorities for their reference and follow-up.

International training course on the topic “Space technology applications in disaster risk reduction”, Dehra Dun, India, 9 April to 4 May 2012

16. A one-month training course was held at the Centre for Space Science and Technology Education in Asia and the Pacific in Dehra Dun, India, jointly conducted by the Indian Institute of Remote Sensing of the Indian Space Research Organisation, UN-SPIDER, the Economic and Social Commission for Asia and the Pacific and the United Nations University. UN-SPIDER sponsored five officials from Bangladesh, Myanmar, Solomon Islands and Sri Lanka. The course was held in follow-up to the recent technical advisory missions carried out by UN-SPIDER in Bangladesh, Sri Lanka and Myanmar. (A technical advisory mission for Solomon Island is under consideration.) The objectives of the international training course were to strengthen the participants’ understanding of how space-based information, services and solutions can be used to reduce disaster risks and losses. The participants were exposed to relevant space-based geoinformation (remote sensing, geographic information systems, satellite positioning systems) and communications technologies and their synergies with modelling techniques that can be used in different phases of disaster risk reduction for a variety of hazards. A total of 27 participants from 17 countries participated in the course.

Capacity-building training course on the topic “Space technology for improving hazard mapping in Sri Lanka”, 14 to 17 August 2012

17. The four-day UN-SPIDER capacity-building training course on the topic “Space technology for improving hazard mapping in Sri Lanka”, in follow-up to the technical advisory mission to Sri Lanka in October 2011, was jointly organized by the Disaster Management Centre of Sri Lanka and UN-SPIDER with support from Uva Wellassa University of Sri Lanka, UNDP in Sri Lanka and the National Disaster Reduction Centre of China. Experts from United Nations agencies, regional organizations, national agencies and institutions, the private sector and universities were invited, including more than 10 international experts from the following organizations: UN-SPIDER, UNDP in Sri Lanka, the Economic and Social Commission for Asia and the Pacific, the National Disaster Reduction Centre of China, the Chinese Academy of Sciences (Institute of Remote Sensing Applications), the Asian Institute of Technology, Bangkok, the Tropical Institute of

Marine Sciences, the National University of Singapore, Jena Instrument, the Russian Federation and the Ministry of Land and Land Development of Sri Lanka. The course was also attended by 25 participants involved in disaster management and hazard mapping in Sri Lanka.

18. Sessions were conducted on the current state of the use of space-based information for disaster management in Sri Lanka; recommendations of the UN-SPIDER technical advisory mission; regional cooperation for disaster reduction management and disaster reduction strategy; the applications of a light detection and ranging digital evaluation model; flood-hazard mapping; GeoNetwork and coastal hazard mapping, coastal zone management and integrated shoreline management plans.

National training course on geo-informatics for disaster risk management, Myanmar, 26 to 30 November 2012

19. At the request of the Government of Myanmar, UN-SPIDER carried out a technical advisory mission to Myanmar in March 2012. As a follow-up to that mission, the training course on geo-informatics was organized in Myanmar to strengthen the capacity of national organizations and stakeholders in disaster management by imparting knowledge and skills to practitioners on the use of space-based and geospatial information, tools and techniques for effective disaster risk management. The training was aimed at providing a technological basis for all partners of the Relief and Resettlement Department of the Government of Myanmar in strengthening the ability of those stakeholders to deliver quality products and services for disaster management, specifically using space-based and other geospatial information. The training was jointly organized by the Office for Outer Space Affairs and the International Centre for Integrated Mountain Development.

Training programme on the topic “Space technology for drought monitoring in Africa and Asia”, Beijing, 11 to 16 November 2012

20. The training programme on space technology for drought monitoring in Asia and Africa was jointly conducted by UN-SPIDER and the National Disaster Reduction Centre of China with support from Capital Normal University of China. The following topics were addressed during the training: drought management and space technology; satellite data processing and spatial-temporal analysis; space technology applications in drought risk assessment; and space technology applications in drought monitoring and loss assessment. The training programme was attended by 16 participants from Africa and the Asia-Pacific region.

Training in Remote Sensing for Disaster Management, Cameroon, 7 to 11 May 2012

21. On the basis of a recommendation of the technical advisory mission to Cameroon in June 2011, UN-SPIDER supported training in remote sensing for disaster management, at the request of the UN-SPIDER national focal point for Cameroon. The training was conducted jointly with the United Nations University Institute for Environment and Human Security from 7 to 11 May 2012. Twenty-five participants from the Ministry of Territorial Administration and Decentralization and various other ministries and universities attended. In addition, UN-SPIDER and the United Nations University Institute for Environment and Human Security

funded the participation of five selected representatives from four other Central African States (Burundi, Congo, Democratic Republic of the Congo and Gabon).

22. Trainers from the Regional Centre for Training in Aerospace Surveys (RECTAS) and the United Nations University Institute for Environment and Human Security carried out training sessions on basic elements of remote sensing, GIS, simple data extraction and geo-referencing techniques, including various presentations and visual material on the use of remote sensing for disaster management. The training was also aimed at raising awareness about existing mechanisms to access space-based information, such as the International Charter on Space and Major Disasters and the Global Monitoring for Environment and Security initiative.
