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Technical advisory support activities carried out in 2011 in the framework of the United Nations Platform for Space-based Information for Disaster Management and Emergency Response

Report of the Secretariat

Contents

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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 to provide universal access to all countries and all relevant international and regional organizations to all types of space-based information and services relevant to disaster management to support the full disaster management cycle and agreed that the programme should be implemented as a programme of 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 activities carried out under the UN-SPIDER programme in 2011, specifically in the areas of technical advisory support and support for emergency response as set out in the workplan for the biennium 2010-2011 (A/AC.105/937, annex).

II. Technical advisory support activities carried out in 2011

4. In 2011, the Office for Outer Space Affairs, through the UN-SPIDER programme, worked with Member States that had requested support in accessing and using space-based solutions for disaster risk management and emergency response. Such support included:

(a) Assessment of national capacity and evaluation 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 customization of guidelines and templates for including space-based technologies in disaster risk reduction and emergency response activities;

(d) Facilitation of access of national institutions to space-based information in order to support disaster risk reduction and emergency response activities;

(e) Identification of training needs and facilitation 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 primary activities of the UN-SPIDER programme at the national level and aims at providing Member States with the assistance listed in the previous paragraph. Technical advisory support may include: (a) technical advisory missions involving international teams of experts representing space and disaster management agencies and relevant international and regional organizations and institutions; (b) technical advice provided to national institutions by such means as meetings, teleconferences and videoconferences; and (c) facilitation of direct cooperation between national institutions and providers of space-based information and solutions.

6. As disaster risk management calls for involvement from several sectors, when carrying out a technical advisory mission, the mission team examines several different areas, including data access and policy, information management, national spatial data infrastructure and institutional coordination.

7. For each mission, a formal report is produced that contains a summary of findings, recommendations and suggestions for follow-up action on guidelines and policies relating to disaster risk management issues, always on the basis of the use of space-based information at all stages of disaster management. The reports are shared with the requesting Member State and with the other institutions involved in the mission. The mission report often provides valuable information to the United Nations country offices involved in disaster management in the Member State.

8. The findings and recommendations contained in the reports of the seven technical advisory missions carried out in 2011 have been summarized in the annex to the present report.

9. During the biennium 2010-2011, UN-SPIDER reached its established target of providing technical advisory support to 23 countries: Bangladesh, Burkina Faso, Cameroon, Chile, Colombia, Dominican Republic, Ecuador, Fiji, Guatemala, Haiti, India, Jamaica, Madagascar, Malawi, Maldives, Mozambique, Namibia, Nigeria, Philippines, Samoa, Sri Lanka, Sudan and Togo.

10. Additionally, in 2011, emergency support was provided through UN-SPIDER in the aftermath of seven natural disasters, namely the earthquake in Japan, the drought in the Horn of Africa, an earthquake in Pakistan and floods in Ghana, Namibia, Nigeria and Thailand.

A. Africa

11. Disaster management institutions in Africa are facing an increasing number of natural disasters in the form of floods and drought. In the future, resulting outbreaks of water-borne diseases and epidemics of weather- and climate-sensitive infectious diseases, including malaria, meningitis and cholera, may cause increasing disruption to societies and further burden national health systems.

12. In providing support to African countries to deal with these increasingly frequent disasters, UN-SPIDER works closely with relevant coordination mechanisms and networks, including the Africa Regional Strategy for Disaster Risk Reduction, led by the United Nations International Strategy for Disaster Reduction.

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

14. In January 2011, the Extreme Natural Hazards and Societal Implications International Workshop on Extreme Natural Hazards and Disaster Risk in Africa was held in Pretoria. It was hosted by the Aon Benfield Natural Hazard Centre of the University of Pretoria. Its objective was to provide opportunities to international experts and the African research community to discuss and analyse major topics related to extreme natural events and disaster risk and to establish links and networks between African experts and relevant international organizations. UN-SPIDER contributed as a member of the programme committee and a presentation was given on its activities.

15. In April 2011, under the leadership of the Italian non-governmental organization Cooperazione Internazionale, and with the support of funding received from the disaster preparedness programme of the Humanitarian Aid Department of the European Commission, UN-SPIDER provided capacity-building support to the Government of Mozambique, specifically its National Institute of Disaster Management, and participated in a related seminar on the use of geographic information systems to support disaster risk management.

16. At the request of the Government of the Sudan, through its National Remote Sensing Authority, a technical advisory mission to the country took place in June 2011. Various ministries and other relevant Governmental institutions were visited.

17. Similarly, at the request of the Government of Cameroon, through the Department of Civil Protection of the Ministry of Territorial Administration and Decentralization, a UN-SPIDER technical advisory mission travelled to Yaoundé in June 2011.

18. At the request of the Government of Nigeria, through its National Emergency Management Agency, UN-SPIDER conducted a technical advisory mission to the country in June 2011.

19. As a follow-up to the technical advisory mission to Burkina Faso that took place in 2008, UN-SPIDER provided support and funding for a technical training and outreach activity in Ouagadougou from 26 to 30 September 2011. The aims of the event were to train a network of professionals from different institutions and countries and to establish an inter-institutional technical group as a way of further institutionalizing the use of space-based information for disaster risk management. The training and related events were hosted by the Ministry of Environment and Sustainable Development and were carried out jointly by UN-SPIDER staff and trainers from the Regional Centre for Training in Aerospace Surveys. Using funds provided by the Government of Austria, UN-SPIDER facilitated the attendance of three participants from Cameroon and three experts from Togo at the training.

20. UN-SPIDER participated in the Sino-African High Level Seminar on Drought Risk Reduction, held in Beijing from 25 to 27 September 2011, which was organized by the International Strategy for Disaster Reduction and the Ministry of Civil Affairs of China.

21. UN-SPIDER continued to work closely with and to build upon the expertise and capabilities of its regional support offices established in Africa, namely the Algerian Space Agency, the National Space Research and Development Agency of Nigeria and the Regional Center for Mapping of Resources for Development, which is based in Nairobi. It also works in close coordination with the Economic Commission for Africa, the United Nations Development Programme and the regional offices of the Office for the Coordination of Humanitarian Affairs of the Secretariat in Africa and the United Nations International Strategy for Disaster Reduction.

B. Asia and the Pacific

22. The opening of the UN-SPIDER office in Beijing has boosted the presence of the programme in Asia and the Pacific, a region accounting for 40 per cent of all the natural disasters recorded between 2000 and 2009.

23. During the biennium 2010-2011, UN-SPIDER provided support to the following countries in the region of Asia and the Pacific: Bangladesh, Fiji, India, Maldives, Philippines, Samoa and Sri Lanka.

24. At the request of the Government of Bangladesh, through its Disaster Management Bureau, UN-SPIDER carried out a technical advisory mission to the country from 19 to 23 June 2011.

25. As a follow-up activity of the technical advisory mission to Bangladesh, the UN-SPIDER programme contributed to the Asia-Pacific Space Cooperation Organization Training Course on Environment and Disaster Monitoring through Space Technology from 22 November to 1 December 2011 in Dhaka. The programme provided the funding for one participant from Afghanistan and one from Bangladesh and provided the outline of the course.

26. At the request of the Government of Sri Lanka, UN-SPIDER carried out a technical advisory mission to the country from 17 to 21 October 2011.

27. The second National Institute of Disaster Management/UN-SPIDER workshop on Space Technology Application in Disaster Management and Emergency Response was organized by the National Institute of Disaster Management in New Delhi from 28 to 30 March 2011. The workshop was attended by 25 participants from Bangladesh, India, Maldives, Nepal and Sri Lanka. It aimed at increasing awareness among staff of disaster management authorities with regard to the use of space-based information for disaster risk reduction, in cooperation with State and regional remote-sensing applications centres.

28. In providing support to countries in the region of Asia and the Pacific, UN-SPIDER works closely with relevant coordination mechanisms and networks. In 2011, its coordination activities in that region included the following: (a) participation in the Asian Partnership on Disaster Reduction of the International Strategy for Disaster Reduction; (b) contribution to the Asian Ministerial Conference on Disaster Risk Reduction, which is held biennially; (c) contribution to the Committee on Disaster Risk Reduction of the Economic and Social Commission for Asia and the Pacific and related expert group meetings; (d) participation in the Pacific Platform for Disaster Risk Management; (e) contribution to the efforts of the

Pacific Humanitarian Team, led by the Office for the Coordination of Humanitarian Affairs of the Secretariat; and (f) participation in leading Asian space policy forums and initiatives, including the Asia-Pacific Regional Space Agency Forum and the Asia-Pacific Space Cooperation Organization.

29. UN-SPIDER participated in the Asian Partnership on Disaster Reduction of the International Strategy for Disaster Reduction meeting from 6 to 8 September 2011 and highlighted its role in supporting the objectives of the Partnership, which include (a) support to the political leadership of the regional platform through the Asian Ministerial Conferences on Disaster Risk Reduction and the setting up of a joint regional disaster risk reduction strategy and action plan; and (b) support to the biennial Hyogo Framework for Action progress review, which includes monitoring national and regional progress and monitoring the implementation of the joint regional action plans and recommendations from the Asian Ministerial Conferences.

30. The fourth Joint Project Team Meeting of Sentinel Asia was held in Putrajaya, Malaysia, from 12 to 14 July 2011. The UN-SPIDER programme was represented at this meeting in its capacity as a member of the Joint Project Team Meeting and gave a presentation on the work carried out in the framework of the programme in the region of Asia and the Pacific.

31. UN-SPIDER also participated in the Expert Group Meeting on Regional Knowledge and Cooperation for Comprehensive Multi-Hazard Risk Management in Asia and the Pacific, held in Bangkok from 27 to 29 June 2011, and the second session of the Committee on Disaster Risk Reduction, held in Bangkok from 29 June to 1 July 2011, helping Member States understand the need to prioritize the use of space-based information in disaster risk reduction.

32. UN-SPIDER also participated and contributed to the following events: the Humanitarian Partnership Workshop for the Asia-Pacific Region: Strengthening Disaster Preparedness and Response Capacity, held in Shanghai, China, from 12 to 13 October 2011 and led by the Office for the Coordination of Humanitarian Affairs; the Asia-Pacific Space Cooperation Organization Third International Symposium on Earth Quake Monitoring and Early Warning by Using Space Technology, held in Beijing from 13 to 15 September 2011; and the 18th session of the Asia-Pacific Regional Space Agency Forum, whose theme was “A regional collaboration for tomorrow’s environment”, held in Singapore from 6 to 9 December 2011.

33. In carrying out its work in the region of Asia and the Pacific, UN-SPIDER works closely with and builds upon the expertise and capabilities of the regional support offices established in that region, namely the Iranian Space Agency, the Pakistan Space and Upper Atmosphere Research Commission and the Asian Disaster Reduction Center. These regional support offices participated in and contributed to the technical advisory missions that were carried out.

C. Latin America and the Caribbean

34. The natural disasters that affected Latin America and the Caribbean in 2010 and 2011 guided the support provided by UN-SPIDER staff to the region. During the biennium 2010-2011, UN-SPIDER staff provided support to the following

countries: Chile, Colombia, Dominican Republic, Ecuador, Guatemala, Haiti and Jamaica. UN-SPIDER staff have also been working with the national agencies responsible for disaster risk management and emergency response in Belize, El Salvador and Mexico.

35. Following a technical advisory mission to the Dominican Republic in January 2010, UN-SPIDER staff carried out a second mission to the country, in coordination with the National Emergency Commission, to institutionalize the use of space-based information through the establishment of an inter-institutional group focusing on using remote-sensing applications to support the generation of information to be used in all phases of the disaster management cycle.

36. In March 2011, UN-SPIDER staff contributed to a regional simulation exercise conducted by the National Coordinating Agency for Disaster Reduction of Guatemala, with the support of the Coordination Centre for the Prevention of Natural Disasters in Central America and the United States Southern Command. The exercise simulated an earthquake and aimed to test the standard operating procedures implemented by the National Emergency Operations Centre of Guatemala and the specific procedures for requesting humanitarian assistance that have been developed by the ministries of foreign affairs of Central American countries under the auspices of the Coordination Centre. UN-SPIDER staff worked in conjunction with various partners to generate a procedure for forecasting the impact of earthquakes on housing in Guatemala.

37. Taking into consideration the need to support activities conducted by partners, the UN-SPIDER programme facilitated the participation of an expert from the regional support office, which is operated by the Water Center for the Humid Tropics of Latin America and the Caribbean in Panama, in an activity carried out by the Agustin Codazzi Geographic Institute in Colombia. The expert conducted a one-day workshop on the use of space-based information for disaster risk reduction and emergency response.

38. UN-SPIDER also took part in a one-day workshop organized by the United States Geological Survey as part of the annual meeting of the Pan American Institute of Geography and History. The workshop focused on the use of geospatial information in crises such as natural disasters.

39. In addition, and taking into consideration the increasing frequency and severity of floods in Central American countries, staff of the UN-SPIDER programme and the Regional Centre for Space Science and Technology Education for Latin America and the Caribbean conducted a training activity to strengthen the institutional capacities of Government agencies with regard to the use of satellite imagery. The training was conducted at the offices of the Regional Centre, located at the National Institute for Astrophysics, Optics and Electronics, in Tonantzintla, Mexico, from 24 to 28 October 2011. The Institute of Astronomy and Space Physics, Argentina, and the Water Center, Panama, also contributed to the training by providing instructors. The training was aimed at experts from Belize, El Salvador, Guatemala and Mexico responsible for supporting disaster response and risk management efforts using remote-sensing techniques. Twelve participants from 10 Government agencies from the four countries attended the training.

40. In view of the high degree of vulnerability of Guatemala to natural disasters, a technical advisory mission to that country was conducted from 31 October to

4 November 2011 to continue work with the inter-institutional group that had been set up to support disaster response activities related to tropical storm Agatha, which struck the country in June 2010. The mission included visits to several Government ministries and agencies, including the Secretariat for Planning and Programming, the Ministry of Environment and Natural Resources, the National Geographic Institute, the National Institute of Statistics, the National Coordinating Agency for Disaster Reduction, and the Coordination Centre for the Prevention of Natural Disasters in Central America.

41. In the context of disaster risk reduction, UN-SPIDER staff organized and conducted a special event during the second session of the Regional Platform for Disaster Reduction in the Americas, which was held in Nayarit, Mexico, in March 2011, to promote the use of space-based information to support disaster risk management activities. The session brought together UN-SPIDER partners, including Thermopylae Sciences and Technology, the National Commission on Space Activities of Argentina, the Regional Centre for Space Science and Technology Education for Latin America and the Caribbean, the National Centre for Prevention of Disasters of Mexico, and representatives of various Government agencies, international organizations and non-governmental organizations.

42. In Latin America and the Caribbean, UN-SPIDER staff work closely with and build upon the expertise and capabilities of the regional support offices established in that region, namely the Water Center for the Humid Tropics of Latin America and the Caribbean and the University of the West Indies, and have benefited from the continuing support of the National Commission on Space Activities of Argentina, the Agustin Codazzi Geographic Institute in Colombia and the Regional Centre for Space Science and Technology Education for Latin America and the Caribbean.

D. West Asia

43. The work of UN-SPIDER in West Asia focuses on identifying possible partners and establishing a network to enable it to provide support to countries in the region. UN-SPIDER has also been contributing to specific activities, such as a half-day training session for 40 civil defence managers from 11 countries from the region of the Middle East and North Africa, in conjunction with the Training College of Naif Arab University for Security Sciences, Saudi Arabia.

44. UN-SPIDER also gave a presentation on its activities at the Global Space and Satellite Forum in Abu Dhabi.

E. Small island developing States

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

46. The UN-SPIDER programme has been providing support to small island developing States since 2008, when regional workshops were organized in both the Caribbean and the Pacific. Additional activities included carrying out technical advisory missions to the Dominican Republic, Fiji, Haiti, Jamaica, Maldives and Samoa and providing funding to allow experts from national disaster management organizations in those countries to attend relevant meetings.

47. A further contribution from the Ministry for European and International Affairs of Austria in 2011 enabled the UN-SPIDER programme to continue supporting small island developing States by, for example, carrying out technical advisory missions to both the Dominican Republic and Sri Lanka and coordinating with experts from Tonga with regard to carrying out a technical advisory mission to that country in 2012.

48. With regard to the Pacific, UN-SPIDER staff continued providing support to the Governments of Fiji and Samoa, building upon the recommendations of the technical advisory missions that had been carried out in those countries in 2009. The UN-SPIDER staff also provided support to allow an expert from the National Disaster Management Office of Samoa to attend the second UN-SPIDER international meeting of experts on "crowdsource mapping for preparedness and emergency response". That participation encouraged wide international support, in particular from the volunteer and technical communities, for the Samoa simulation exercise, which was successfully carried out on 3 and 4 December 2011.

III. Support for emergency response

A. Building upon existing mechanisms and opportunities

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

50. In addition, the UN-SPIDER programme has cooperation agreements with the National Disaster Reduction Centre of China; together they provided rapid mapping support in the aftermath of three major disasters in 2011. UN-SPIDER has also been able to channel support from other providers of satellite resources, such as space agencies and the private sector.

51. In providing support to Member States, the UN-SPIDER programme ensures the involvement of the UN-SPIDER regional support offices and other centres of excellence in supporting the analysis of space-based data.

B. Support provided in 2011

52. In 2011, emergency response activities were supported in a total of seven emergency situations. Support was provided in the Horn of Africa and in the following countries: Ghana, Japan, Namibia, Nigeria, Pakistan and Thailand.

53. UN-SPIDER ensured the effective coordination of the information-sharing during the various disaster situations, including by making imagery and data available electronically and sharing geospatial information with United Nations experts and other emergency response personnel deployed to the affected areas. Data-sharing was also facilitated through use of the storage capacity and functionality of the UN-SPIDER applications server infrastructure linked to the knowledge portal, and UN-SPIDER experts were in frequent communication both with disaster response experts at the national level and with United Nations staff involved in the international response effort.

54. UN-SPIDER set up a dedicated web page (www.un-spider.org/japan-pacific) in order to support the relief efforts for Japan, following the earthquake in March 2011. UN-SPIDER, together with its established networks and other agencies, coordinated the collection of relevant pre- and post-disaster space-based information. Through the regional support offices, nominated national focal points and the leading providers of space-based information and social media resources, UN-SPIDER staff collected space-based information representing a significant source of information for the disaster relief efforts in Japan. Major relief and response websites identified the UN-SPIDER resource page as an important information and data source. UN-SPIDER staff also cooperated with staff of the International Atomic Energy Agency by means of exchanging data and sharing information.

55. UN-SPIDER staff took a leading role in providing support in the aftermath of the floods that affected Namibia in April 2011, inter alia, through the immediate activation of the International Charter on Space and Major Disasters and the delivery of satellite imagery and maps of the affected areas. Close coordination and information-sharing were ensured in subsequent weeks.

56. UN-SPIDER also supported the relief operations following the severe drought experienced in the Horn of Africa in 2011. Consecutive droughts have affected the region over the last few years, triggering a food crisis in parts of Djibouti, Ethiopia, Kenya and Somalia and leaving more than 12 million people in need of humanitarian assistance. UN-SPIDER coordinated with agencies such as the World Food Programme and the Office for the Coordination of Humanitarian Affairs to facilitate the dissemination of information on areas of interest, needs and available resources. In addition, UN-SPIDER cooperated with other institutions, in particular the National Disaster Reduction Centre of China, to facilitate the acquisition of additional data and mapping assistance. Relevant space-based information was made available at www.un-spider.org/horn-of-africa-2011.

57. The National Disaster Reduction Centre of China also provided imagery from satellites launched into space by China to support Earth observation and a rapid-response map to support flood monitoring in Thailand in November 2011, based on a request to UN-SPIDER from the Economic and Social Commission for Asia and

the Pacific. The images were made available to the Geo-Informatics and Space Technology Development Agency of Thailand.

58. In August 2011 in Nigeria, a devastating flood affected communities in Ibadan. The UN-SPIDER regional support office in Nigeria was involved in supporting the response efforts during the emergency.

59. After the earthquake that struck Dalbandin, Pakistan, in January 2011, the Space and Upper Atmosphere Research Commission of Pakistan, a UN-SPIDER regional support office, provided imagery and maps to the national disaster authority to support relief efforts.

Annex

Technical advisory missions carried out in 2011 in the framework of the United Nations Platform for Space-based Information for Disaster Management and Emergency Response

1. In 2011, technical advisory missions were carried out in the framework of the United Nations Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER) in the following countries: Bangladesh, Cameroon, Dominican Republic, Guatemala, Nigeria, Sri Lanka and Sudan.

A. Bangladesh

2. At the invitation from the Government of Bangladesh, through its Disaster Management and Relief Division, a UN-SPIDER technical advisory mission to the country was carried out from 19 to 23 June 2011. The key objectives of the mission were to assess national capacity, evaluate disaster and risk reduction activities, policies and plans with regard to the use of space-based technologies, and facilitate the access of national institutions to space-based information in order to support the full cycle of disaster management. The mission team comprised eight experts from UN-SPIDER, the National Disaster Reduction Centre of China, the Office for the Coordination of Humanitarian Affairs of the Secretariat, the Asian Disaster Reduction Center, the Centre for Space Science and Technology Education in Asia and the Pacific, the Space and Upper Atmosphere Research Commission of Pakistan and the Asia-Pacific Space Cooperation Organization.

3. The mission team visited 12 key stakeholders, namely the Disaster Management Bureau, the Department of Relief and Rehabilitation, the Center for Environmental and Geographic Information Services, the Bangladesh Meteorological Department, the Bangladesh Space Research and Remote Sensing Organization, the Comprehensive Disaster Management Programme, the Survey of Bangladesh, the Cyclone Preparedness Programme, the Institute of Water Management, the Flood Forecasting and Warning Centre, the Bangladesh Telecommunication Regulatory Commission and the Early Recovery Facility of the United Nations Development Programme.

4. On 21 June, UN-SPIDER, the Ministry of Food and Disaster Management and the Comprehensive Disaster Management Programme organized a one-day workshop that was attended by over 60 representatives from various Government and United Nations agencies to discuss cross-cutting issues related to use of geographic and space-based information for disaster risk reduction and emergency response.

5. The following recommendations were made by the expert team and were included in the technical advisory mission report:

(a) The National Plan for Disaster Management and the Standing Orders on Disaster should be updated to mention the use of space-based information and

technology as part of the disaster management framework for improved capabilities of risk management and emergency response;

(b) Coordination between departments of the Ministry of Defence (technology providers) and the Ministry of Food and Disaster Management (technology users) should be enhanced in order to ensure cooperation at the working level with the aim of considering space-based resources as a common resource for the purpose of disaster management and ensuring that space technology providers provide services directly to end-users;

(c) Frequent awareness-raising programmes for decision makers should be held in order to strengthen institutional preference for using space-based information to support disaster management. In addition, capacity-building of disaster management institutions should take place in order to develop relations between them and technology provider organizations;

(d) Data- and information-sharing policies, standards and coordination mechanisms need to be developed to support disaster risk reduction at the national level, based on the principle that data are a national property and need to be shared openly, in particular in the event of a disaster. To facilitate data-sharing, the data catalogue and sharing platform should be created based on existing resources. Information products should cater to the precise requirement of end-users;

(e) Access to national spatial data infrastructure templates, baseline data and operational disaster-related databases should be provided to all stakeholders. That access should ensure the timely availability of appropriate satellite and geospatial data and a strong data policy should be in place to conform with the data standards and formats.

(f) Satellite-based emergency communication systems should be stationed in Bangladesh and satellite communication technology should be utilized to train Cyclone Preparedness Programme volunteers. Equipment such as flyway terminals, satellite telephones, mobile terminals and back-up power sources should be provided.

B. Dominican Republic

6. A technical advisory mission was conducted in the Dominican Republic from 7 to 11 November 2011 in coordination with the National Emergency Commission and the Ministry of Foreign Affairs. The mission benefited from the support of experts from the UN-SPIDER programme and the regional support office, which is operated by the Water Center for the Humid Tropics of Latin America and the Caribbean in Panama and the Agustin Codazzi Geographic Institute of Colombia.

7. The objective of the mission was to conduct a technical workshop with the aim of drawing up a plan of action to institutionalize the use of space-based information through the implementation of an inter-institutional technical group as a way of supporting the National Emergency Commission in its prevention and preparedness efforts and the Emergency Operations Centre in its disaster-response efforts.

8. The mission included the holding of an inter-institutional workshop organized by the National Emergency Commission and UN-SPIDER staff. Donors and

representatives from 15 Government agencies, international organizations and non-governmental organizations contributed to discussions on how best to institutionalize the use of space-based information to support all phases of the disaster management cycle.

Results

9. The mission allowed the National Emergency Commission and UN-SPIDER staff to outline the plan of action to be implemented by the Commission in institutionalizing the use of space-based information. The plan includes, in particular:

(a) The identification of changes in policies, strategies and standard operating procedures required to institutionalize the use of such information;

(b) The establishment of an inter-institutional group of professionals from specific Government agencies that would focus on remote-sensing applications. The group will process satellite imagery to generate information to be used in all phases of the disaster management cycle;

(c) Follow-up activities to be carried out in the framework of the UN-SPIDER programme, including the training of the members of the inter-institutional group in specific remote-sensing techniques for natural disasters, and the facilitation of links between this group in the Dominican Republic and similar groups already established in Chile, Guatemala, Jamaica and Mexico;

(d) Follow-up activities to be carried out by the technical group, including an inventory of currently available satellite imagery, discussions on past experiences on the use of remote-sensing applications to support disaster response activities, the design or use of an existing geo-viewer to disseminate the geospatial information generated by the group, and an evaluation of existing geospatial information on hazards as a way of preparing a national hazards map.

C. Cameroon

10. At the request of the Government of Cameroon, through the Department of Civil Protection of the Ministry of Territorial Administration and Decentralization, UN-SPIDER staff conducted a technical advisory mission in the country from 6 to 10 June 2011 to assess the current and potential use of space-based information in all aspects of disaster management and to strengthen disaster risk management in Cameroon by advising on improved access to and use of space-based information for disaster risk reduction and emergency response. The observations and recommendations made by the mission were circulated to the Government and will form the basis of an action plan to be prepared and followed up on a regular basis.

11. The mission team consisted of 12 experts from the UN-SPIDER programme, the Regional Office for West and Central Africa of the Office for the Coordination of Humanitarian Affairs, the National Space Research and Development Agency of Nigeria, the Algerian Space Agency, the Regional Centre for Training in Aerospace Surveys, the National Emergency Management Agency of Nigeria, Surrey Satellite Technology Ltd. and DMC International Imaging of the United Kingdom of Great Britain and Northern Ireland, and Planet Action, France.

12. In addition to visits to stakeholder organizations, a one-day workshop was organized for more than 70 experts from the disaster management, geospatial and academic communities of Cameroon.

13. The mission and the workshop highlighted the high level of expertise available across all participating organizations in Cameroon, including in the academic community. At the same time, it was clear that much could be improved in terms of direct access to space-based information and the development of a national spatial data infrastructure that could facilitate the better use of such information and its absorption by local institutions, including the need for further relevant capacity-building and training across all institutions with disaster management responsibilities. Several other recommendations and offers of support were made by some of the mission experts, based on the information obtained during the mission. These are contained in the respective sections of the mission report.

14. The key considerations and recommendations put forward during the mission consultations were as follows:

(a) Cooperation should be enhanced between the producers and users of space-based data and information in order to give further prominence to the use of space-based technologies;

(b) The use of space-based data and information should be integrated into disaster management policies from the national level to the local government and administration level;

(c) Work should be undertaken with support from the UN-SPIDER programme to set up a national digital geospatial data infrastructure for multiple applications for common risks;

(d) Data and information should be provided on a periodic basis, and at the request of all the stakeholders, to the National Risk Observatory, which was established in 2003 and whose main mission is to centralize all available information on risks;

(e) UN-SPIDER staff could be invited to support a regional workshop that would aim at signing an agreement to establish Cameroon as a focal point in Central Africa in matters of exploiting satellite-based data and information for disaster risk reduction and management;

(f) UN-SPIDER activities could be integrated into the plan of action for preparation and response to flooding and natural disasters 2011-2016, which was developed in September 2010 with the aim of achieving an improved regional strategy for crisis response;

(g) At the request of UN-SPIDER staff, the available avenues and means for finalizing the legal instruments to guide the actions of Cameroon in the Central African region could be examined;

(h) The current needs and requests of the Geological and Volcanological Research Unit, as presented to the mission team during the field visit, should be considered by the Director of Civil Protection.

D. Guatemala

15. In recent years, Guatemala has faced droughts and the resulting food insecurity. It has experienced hurricanes and tropical storms, such as Tropical Storm Agatha, which, in June 2010, destroyed critical infrastructure in many regions of the country. In October 2011, Guatemala suffered the effects of tropical depression 12E, which also destroyed infrastructure and caused nearly 40 fatalities and extensive losses in the agricultural sector.

16. In view of the high degree of vulnerability of Guatemala to natural disasters, a technical advisory mission to that country was conducted to continue institutionalizing the use of space-based information to support all phases of the disaster management cycle. The mission included visits to the Secretariat for Planning and Programmes, the National Geographic Institute, the National Coordinating Agency for Disaster Reduction, the National Statistics Institute and the Ministry of Environment and Natural Resources. The purpose of the mission was to outline the next steps to be taken in the institutionalization of a technical group composed of representatives of Government agencies and universities that would support the National Coordinating Agency for Disaster Reduction, the Secretariat for Planning and Programmes and other Government agencies in the generation of information to support all phases of the disaster management cycle.

Results

17. The directors of the National Geographic Institute and the Secretariat for Planning and Programmes will institutionalize the group of professionals from a variety of Government agencies and universities, which will focus its attention on the use of satellite imagery and remote-sensing applications. The technical group will be established under the umbrella of the national geographic information system of Guatemala, which was launched by the National Geographic Institute in 1997.

18. In addition, the mission allowed UN-SPIDER staff to share the preliminary results of the research under the Rapid Impact and Vulnerability Analysis Fund of Global Pulse, which focused on analysing how the global economic crisis of 2008 and 2009 affected the vulnerability of communities to disasters.

19. Finally, the mission took note of the efforts of the Ministry of Environment and Natural Resources regarding the use of geospatial information to track land-use changes, environmental degradation and natural disasters, including drought and landslides. The Ministry reiterated the usefulness of the information generated by the Water Center for the Humid Tropics of Latin America and the Caribbean on the presence and characteristics of a cyanobacteria that is present in Lake Atitlán.

E. Nigeria

20. At the request of the Government of Nigeria, through its National Emergency Management Agency, UN-SPIDER staff conducted a technical advisory mission in the country from 13 to 17 June 2011 to assess the current and potential use of space-based information in all aspects of disaster management in Nigeria and to strengthen disaster risk management in the country by accessing and using space-based

information for disaster risk reduction and emergency response. The mission team consisted of seven experts from UN-SPIDER, the National Space Research and Development Agency, the Regional Centre for Training in Aerospace Surveys and the World Meteorological Organization.

21. In addition to visits to stakeholder agencies, a one-day workshop was organized for more than 100 experts from the Nigerian disaster management community.

22. The following considerations and recommendations were put forward on the basis of the mission:

(a) Special awareness-raising events should be held for decision makers;

(b) Existing capacities and opportunities need to be mapped and capacity-building needs should be defined;

(c) A clear data policy needs to be developed regarding NigeriaSat-2 to ensure access to disaster risk management activities in Nigeria and around the world;

(d) The full implementation of the National Geospatial Data Information Committee should be ensured;

(e) Cooperating partnerships, including South-South cooperation, should be established;

(f) Memorandums of understanding should be developed with neighbouring countries with regard to the International Satellite System for Search and Rescue (COSPAS-SARSAT) and Nigeria should play a proactive role at regional forums;

(g) Areas for hotspot mapping should be identified and existing opportunities should be leveraged with regard to the Services and Applications for Emergency Response (SAFER) project of the Global Monitoring for Environment and Security (GMES) initiative.

F. Sri Lanka

23. At the invitation of the Ministry of Disaster Management in Sri Lanka and its Disaster Management Center, UN-SPIDER staff carried out a technical advisory mission in the country from 17 to 21 October 2011. The mission team comprised nine experts from the UN-SPIDER programme, the Economic and Social Commission for Asia and the Pacific, the University of Salzburg, Austria, the National Disaster Reduction Centre of China, the Centre for Space Science and Technology Education in Asia and the Pacific, the Pakistan Space and Upper Atmosphere Research Commission, the International Water Management Institute and KN Toosi University of Technology, Islamic Republic of Iran. The key objectives were to assess national capacity, evaluate disaster and risk reduction activities, policies and plans with regard to the use of space-based technologies, and facilitate the access of national institutions to space-based information to support tasks within the full cycle of disaster management.

24. Meetings were held with key stakeholders within the Government, associated departments and agencies and United Nations offices. In total, 11 different

institutions were consulted. In addition, the staff of UN-SPIDER and the Disaster Management Center organized a one-day workshop for more than 90 representatives from various Government institutions, United Nations agencies and academia to discuss cross-cutting issues related to use of geospatial and space-based information for disaster risk reduction and emergency response.

25. The report of the technical advisory mission was submitted to the Ministry of Disaster Management and the Disaster Management Center and will support the development of the national action plan and help secure dedicated resources for applying space-based and geospatial information to support the development of disaster management plans.

Policy and coordination

26. The following recommendations on policy and coordination were put forward by the mission team:

(a) The disaster management policy should be updated to make provisions for incorporating space-based information, satellite-based emergency communication and improved early warning systems;

(b) Coordination within the Disaster Management Center should be improved in order to utilize space-based inputs by the National Disaster Relief Services Centre;

(c) Policy should contain clear definitions of the mechanisms for cooperation and information-sharing between data provider organizations and for leveraging best practice and policy interventions to strengthen the organizations that play a critical role in early warning (in particular the Meteorology Department);

(d) Spatial data infrastructure should be accorded priority to avoid wasting resources and the Information and Communication Technology Agency, the Survey Department and the Arthur C Clarke Institute for Modern Technologies should play a key role in implementing national spatial data infrastructure.

Data and access

27. The following recommendations were made on data and access:

(a) The Survey Department should adopt cooperative and symbiotic means to speed up preparation of the 1:10,000 base map, digital elevation model and thematic maps (on land use, geomorphology, soil types, forests etc.);

(b) Hazard maps should be converted into meaningful risk profiles that can be integrated with the data from multiple resources (spatial, socio-economic, household etc.). Hazard maps should become dynamic through the use of space-based thematic inputs, mainly land use and household (and should be periodically updated).

Information-sharing

28. The following recommendations were made on information-sharing:

(a) Implementation of national spatial data infrastructure is the first step to creating a framework for information-sharing. The Information and Communication

Technology Agency should play a key role, in coordination with the Disaster Management Center, in providing the framework for integrating and sharing spatial, socio-economic and governance-related data.

(b) Standards need to be defined to decide the time frame and formats of information for various users at all levels, in particular to empower administrators at the provincial, district and division level.

Awareness and institutional strengthening

29. The following recommendations were made on awareness and institutional strengthening:

(a) Frequent awareness-raising programmes should be held to appraise decision makers under the auspices of the Disaster Management Center, involving all stakeholders, including data and service providers and users such as the Sri Lanka Institute of Development Administration, in collaboration with the Disaster Management Center.

(b) Specific training requirements should be developed for offices involved in national hazard risk profiling and early warning. Technical infrastructure and human resources should be strengthened.

G. Sudan

30. At the invitation of the Government of the Sudan, a UN-SPIDER technical advisory mission was carried out in the country from 22 to 26 May 2011. The mission team comprised nine experts from the UN-SPIDER programme, the United Nations Environment Programme, the German Aerospace Centre (DLR), the United Nations Development Programme, York University, Canada, Planet Action, the China National Space Administration and the Regional Center for Mapping of Resources for Development. The key objectives of the mission were to assess national capacity, evaluate disaster and risk reduction activities, policies and plans with regard to the use of space-based technologies, and facilitate the access of national institutions to space-based information to support the full cycle of disaster management.

31. The mission team held meetings with key Government stakeholders, including three ministers. A one-day national workshop was organized for over 100 participants from Government, non-governmental organizations, academia, United Nations organizations and private companies.

32. The key recommendations put forward by the mission team included:

(a) Policies should include a sustainable framework for disaster risk reduction to improve early warning, preparedness, response and mitigation based on space technology applications;

(b) There is a critical need to improve institutional arrangements and coordination to ensure effective cooperation between and contributions by all the stakeholders to implement decisions of the National Council for Civil Defence;

(c) Institutional capacity must be developed at the federal and state level to consolidate the application of space technologies and geo-information;

(d) Clear mechanisms for information management and information-sharing must be established, including the development of the country's national spatial data infrastructure.