



---

**Committee on the Peaceful  
Uses of Outer Space****Report on activities carried out in 2013 in the framework of  
the United Nations Platform for Space-based Information  
for Disaster Management and Emergency Response***Summary*

The present report contains a summary of the implementation of activities carried out in 2013 in the framework of the United Nations Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER) under the revised workplan for the biennium 2012-2013 (A/AC.105/C.1/2012/CRP.22).

In 2013 the UN-SPIDER programme reached the established target of providing technical advisory support to 28 countries; worked on the further improvement of its knowledge portal; organized or provided support to a number of international and regional workshops, as well as expert meetings; and facilitated the conduct of capacity-building activities in Africa and Asia.

**I. Introduction**

1. In its resolution 61/110, the General Assembly established 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 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 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 contains a summary of activities carried out in 2013 in the framework of the UN-SPIDER programme under the revised workplan for the biennium 2012-2013 (A/AC.105/C.1/2012/CRP.22).

4. The General Assembly, in its resolution 64/251, entitled "International cooperation on humanitarian assistance in the field of natural disasters, from relief to development", encouraged the further use of space-based and ground-based remote sensing technologies, including those provided by UN-SPIDER. In its resolution 66/71, the Assembly noted with satisfaction the progress made within the framework of UN-SPIDER.

## **II. Organizational framework**

5. The organizational framework of UN-SPIDER has three cornerstones: UN-SPIDER staff, the network of regional support offices and the national focal points. UN-SPIDER fosters knowledge management, builds bridges between communities of providers of space-based information and users of services in the disaster risk management and emergency response communities and provides technical advisory support to Member States. Efforts are being made to raise interest in the programme among other actors in disaster risk reduction and emergency response and to propose innovative forms of collaboration to extend the reach of UN-SPIDER and augment the knowledge it makes available to Member States.

### **A. Staff of the United Nations Platform for Space-based Information for Disaster Management and Emergency Response**

6. The Chief of the Space Applications Section of the Office for Outer Space Affairs is responsible for the overall implementation of the UN-SPIDER programme. The Chief of the Space Applications Section is assisted by a senior programme officer, who is responsible for planning, coordinating and implementing all UN-SPIDER activities, with the support of a programme officer who leads the activities of the UN-SPIDER office in Bonn, Germany; a programme officer who leads the activities of the UN-SPIDER office in Beijing; and a programme officer in Vienna who supports outreach and capacity-building activities and advisory services provided by the programme.

7. During 2013, 13 staff members worked in the framework of UN-SPIDER, distributed as follows:

(a) In Vienna: a senior programme officer; a programme officer responsible for outreach and capacity-building activities; an associate expert (provided by the Government of Austria) to support outreach activities, emergency response support and the administration of the programme; and a team assistant to assist with administrative tasks. From June to December 2013, the programme officer was on loan from the Office for Outer Space Affairs to the Department of Field Support to support the cartographic work of the Cameroon-Nigeria Mixed Commission. During

the same period, a replacement programme officer, specialized in remote sensing and geographic information systems (GIS) was hired on a temporary contract;

(b) In Bonn: a programme officer to lead the activities of the UN-SPIDER office in Bonn; one senior expert (provided by the German Aerospace Centre (DLR) as a non-reimbursable loan until July 2013) to support the implementation of knowledge management activities; an associate expert (also provided by the Government of Germany) to support the compilation and dissemination of information and the maintenance of the content of the knowledge portal; and a third associate expert (also provided by the Government of Germany) to support remote sensing advisory services. The administration and maintenance of the portal services was supported from April 2013 by an associate expert on a temporary assignment supported by funding from the Government of Germany;

(c) In Beijing: a programme officer to lead the activities of the UN-SPIDER office in Beijing and coordinate technical advisory support for Member States; two experts to support technical advisory support activities (provided by the Government of China as non-reimbursable loans); and a team assistant to assist with administrative tasks.

8. The programme also benefited from the regular support of interns at its Vienna and Bonn offices, up to three at a time, for inputting reference material to the portal and executing research in preparation of advisory services.

## **B. Network of regional support offices**

9. In its resolution 61/110, the General Assembly agreed that UN-SPIDER should work closely with regional and national centres of expertise in the use of space technology in disaster management to form a network of regional support offices for implementing the activities of the programme in their respective regions in a coordinated manner.

10. The 16 UN-SPIDER regional support offices<sup>1</sup> are currently being hosted by the following national organizations: the Algerian Space Agency (ASAL), the Iranian Space Agency (ISA), the National Commission for Space Activities (CONAE) of Argentina, the Agustín Codazzi Geographic Institute (IGAC) of Colombia, the Research Institute for Remote Sensing (RIRS) at Károly Róbert University of Hungary, the National Institute of Aeronautics and Space of Indonesia (LAPAN), the National Space Research and Development Agency of Nigeria (NASRDA), the Pakistan Space and Upper Atmosphere Research Commission (SUPARCO), the Romanian Space Agency (ROSA), the Russian Agency for Support and Coordination of Russian Participation in International Humanitarian Operations (EMERCOM) and the National Academy of Sciences and National Space Agency of Ukraine (NASU-SSAU). They are also hosted by the following regional organizations: the Asian Disaster Reduction Centre (ADRC), based in Kobe, Japan; the International Centre for Integrated Mountain Development (ICIMOD); the Regional Centre for Mapping of Resources for Development (RCMRD), based in Nairobi; the University of the West Indies, based in Saint Augustine, Trinidad and Tobago; and the Water Center for the Humid Tropics of

<sup>1</sup> See [www.un-spider.org/network/regional-support-offices](http://www.un-spider.org/network/regional-support-offices).

Latin America and the Caribbean (CATHALAC), based in Panama. Negotiations are under way with institutions in Sri Lanka and South Africa with a view to increasing the number of regional support offices to 18 in the next biennium.

### **C. National focal points**

11. UN-SPIDER has developed the network of focal points within national disaster management agencies to work with UN-SPIDER staff to guide efforts regarding national disaster management planning and policies and to coordinate the implementation of specific national activities that incorporate space-based technology solutions in support of disaster management. Forty-five Member States have nominated a national focal point.<sup>2</sup>

## **III. Activities carried out in 2013**

12. The work carried out by the UN-SPIDER programme in 2013 followed the workplan for the biennium 2012-2013 and was implemented within its regular budget allocation and with voluntary and in-kind contributions from Member States or collaborating entities.

### **A. Outreach and capacity-building activities**

13. The targets for 2013 defined in the workplan of the UN-SPIDER programme were met as stipulated. The proposed workshops, expert meetings and training courses were organized and conducted. In addition, UN-SPIDER staff participated in a number of relevant international conferences and ensured the provision of expert speakers. Furthermore, experts were mobilized to take part in activities organized by partner institutions, for example, when regional support office representatives attended a training event offered by the Charter on Cooperation to Achieve the Coordinated Use of Space Facilities in the Event of Natural or Technological Disasters (International Charter on Space and Major Disasters) (see para. 35 below). The demand for UN-SPIDER collaboration or participation in national, regional or global events is ever-increasing, and in 2013 it was not possible to respond positively to all opportunities offered, because of conflicting schedules or limited resources.

14. Major outreach activities conducted by UN-SPIDER staff included the organization of international and regional workshops and expert meetings. A summary of the activities carried out in 2013 is presented below. Further information, including detailed reports on the activities, is available on the UN-SPIDER knowledge portal.

#### **United Nations/Germany Expert Meeting on the Use of Space-based Information in Early Warning Systems, Bonn, Germany, 25 and 26 June 2013**

15. UN-SPIDER co-organized with DLR the United Nations/Germany Expert Meeting on the Use of Space-based Information in Early Warning Systems with the

---

<sup>2</sup> See [www.un-spider.org/network/national-focal-points](http://www.un-spider.org/network/national-focal-points).

support of the Government of Germany, the Secure World Foundation (SWF) and the German Federal Office of Civil Protection and Disaster Assistance.

16. The expert meeting brought together 55 space technology, disaster risk management and disaster management experts from 20 countries representing 42 national, regional and international organizations, as well as internationally active private companies. The main objective was to review knowledge management strategies to improve existing early warning systems through the incorporation of recent advances in space-based applications. The expert meeting allowed, inter alia, for the sharing of experiences and the compilation of experiences and lessons learned.

**International training programme on flood risk mapping, modelling and assessment using space technology, 22 to 26 July 2013, India**

17. The activity was organized jointly with the Centre for Space Science and Technology Education in Asia and the Pacific (CSSTEAP), the International Water Management Institute (IWMI) and the Economic and Social Commission for Asia and Pacific. The training programme was hosted by CSSTEAP.

18. A total of 19 participants from 11 countries from the Asia-Pacific region attended the training programme. The programme included theory lectures and sharing of experiences by experts from UN-SPIDER, IWMI, the Indian Institute of Remote Sensing (IIRS), the Indian Space Research Organisation (ISRO), the Geo-Informatics and Space Technology Development Agency (GISTDA) of Thailand and the National Disaster Reduction Centre of China (NDRCC). The lectures covered climate change and disaster risk reduction, adaptation to enhanced floods, concepts of flood inundation mapping, the operational flood alert system of ISRO, monitoring and damage assessment using space technologies, the global flood detection system and flood inundation modelling using software tools developed by the Hydrological Engineering Centre of the Army Corps of Engineers of the United States of America.

**Workshop on advances in using space technology and geospatial information for disaster management, China, 21 and 22 October 2013**

19. The activity was aimed at strengthening the capacity of NDRCC to effectively embed space technologies in its activities. Subjects included: integrating climate change adaptation, sustainable development and ecosystems in disaster risk reduction; integrating geospatial technologies for crisis management; using secondary data in humanitarian needs assessments; disaster risk modelling, mapping and profiling for public decision-making; object-oriented image analysis methods in disaster risk management; use of remote sensing data in flood mapping and modelling; and case studies from Asia and Africa.

20. Experts were from UN-SPIDER, Delta State University (United States), the Asia-Pacific regional office of the Office for the Coordination of Humanitarian Affairs of the Secretariat, the University of Twente (Netherlands), IWMI and the Bureau for Crisis Prevention and Recovery of the United Nations Development Programme (UNDP).

**United Nations/China International Conference on Space-based Technologies for Disaster Management: Disaster Risk Identification and Response, Beijing, 23 to 25 October 2013**

21. The conference was co-organized by UN-SPIDER and the Ministry of Civil Affairs of China, in collaboration with the Department of Treaty and Law of China, the Ministry of Foreign Affairs of China, the Department of System Engineering of China, the China National Space Administration (CNSA), the Department of Social Security of China, the Ministry of Finance of China and the Asia-Pacific Space Cooperation Organization (APSCO), and with the support of DigitalGlobe. UN-SPIDER funded 29 participants from United Nations Member States, and APSCO sponsored 17 participants from its member States.

22. The conference brought together 127 participants from 39 countries representing more than 75 organizations.

23. Thirty-five technical presentations in five plenary sessions covered many areas of space technology applications that had been incorporated in operational initiatives, programmes and projects. Other presentations focused on the results of advanced research and development efforts, cooperation mechanisms, national experiences and best practices. The conference also provided a platform for Member States where UN-SPIDER had conducted technical advisory missions to report their workflow in implementing the recommendations resulting from those missions.

**Training course on space technology for flood and drought risk mapping and assessment, China, 27 to 31 October 2013**

24. The international training course on space technology for flood and drought risk mapping and assessment was organized jointly with APSCO and NDRCC and was hosted by Beihang University. A total of 26 participants from Africa, Asia and Latin America participated. Through the training programme, UN-SPIDER continued its work with countries where technical advisory support had been conducted in recent years.

25. The training programme included theory lectures and hands-on exercises involving experts from UN-SPIDER, the Faculty of Geo-Information Science and Earth Observation (ITC) of the University of Twente (Netherlands), IWMI, NDRCC and the Institute of Remote Sensing and Digital Earth (RADI) of the Chinese Academy of Sciences. The lectures covered topics such as GIS-based flood risk assessment and the role of remote sensing for data preparation; global and regional flood risk monitoring and its potential application in water resource management; rapid mapping of floods; flood assessment: remote sensing data and basic modelling for flood assessment; and drought monitoring and risk assessment.

26. On 3 September 2013, the Office of Outer Space Affairs, through UN-SPIDER, presented a report entitled “The Value of Geo-Information for Disaster and Risk Management (VALID): benefit analysis and stakeholder assessment”, edited by Professor Orhan Altan of Istanbul Technical University, who is a member of the Executive Board of the International Council for Science. The report is aimed at raising awareness and helping to set priorities in research and development.

27. In cooperation with the International Federation of Red Cross and Red Crescent Societies, the Embassy of Norway in Vienna and the Austrian Red Cross, on 30 October 2013 UN-SPIDER organized the launch of the *World Disasters Report 2013*, which focuses on technology and the future of humanitarian action.

#### **Other outreach activities**

28. As part of outreach and bridge-building efforts, UN-SPIDER experts are often asked to participate in expert meetings, conferences, workshops, training events and summits. The demand is continuously growing, and activities are prioritized according to their relevance and relationship to ongoing or developing partnerships. As often as possible, events are combined to optimize the use of resources. The main inputs of UN-SPIDER to national, regional and global events are summarized below.

29. UN-SPIDER made a presentation at the regional workshop on a geo-referenced disaster risk management information system for South-East and East Asia and the Pacific, organized by the Economic and Social Commission for Asia and the Pacific and held in Bangkok from 20 to 22 February 2013. The presentation focused on priorities of the Hyogo Framework for Action, the relevance of space-based geographic information and UN-SPIDER interventions.

30. A task team meeting established to outline activities to enhance the guidelines developed by the United Nations Organization for Education, Science and Culture Intergovernmental Oceanographic Commission (IOC) on tsunami risk assessment and management met in Colombo from 27 February to 1 March 2013. The team outlined the programme of work for the revision and update of the IOC publication *Tsunami Risk Assessment and Mitigation for the Indian Ocean: Knowing Your Tsunami Risk — and What to Do About It*. UN-SPIDER has been delegated to review the contents targeting vulnerability assessment and to develop a step-by-step method that outlines how space-based technologies can be used to contribute to the assessment of vulnerability.

31. UN-SPIDER was invited to participate in the High-Level Meeting on National Drought Policies, organized by the World Meteorological Organization (WMO), the secretariat of the United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa, the Food and Agriculture Organization of the United Nations and other United Nations organizations. The meeting took place in Geneva from 11 to 13 March 2013 and brought together more than 500 experts and representatives of various institutions that focus their efforts on drought. UN-SPIDER took the opportunity to comment on the use of space-based information to improve drought early warning.

32. UN-SPIDER participated in the International Symposium on Inclusive Innovation Projects for Disaster Management and Socioeconomic needs, held at Visvesvaraya Technological University, in India on 19 and 20 April 2013. The symposium was jointly organized by CANEUS ([www.caneus.org](http://www.caneus.org)) and the National Design Research Forum. UN-SPIDER made a keynote presentation on disaster management and small-satellite missions and co-chaired a discussion session on small satellites for disaster management and socioeconomic needs, aimed at providing guidance to small-satellite technology providers to cater to the needs of

the end users. The outcome of the symposium was presented to the Principal Scientific Adviser to the Government of India in New Delhi.

33. UN-SPIDER was represented at the fourth session of the Global Platform for Disaster Risk Reduction, held in Geneva from 20 to 24 May 2013. The session outlined ways to shape a post-2015 Hyogo Framework for Action. It allowed the Office for Outer Space Affairs, through UN-SPIDER, to present its activities in the context of the Inter-Agency Meeting on Outer Space Activities.

34. UN-SPIDER participated in the Asian Congress on Citizen and Environment Safety and Security, in Singapore from 5 to 7 June 2013. The congress was organized by the Biomedical Engineering Society (Singapore) and the Hydroinformatics Society (Singapore) with the support of the National University of Singapore and the Asian Development Bank. UN-SPIDER was invited to a special session on Earth observation for disaster risk reduction.

35. The Office for Outer Space Affairs, through UN-SPIDER, is a Cooperating Body of the International Charter on Space and Major Disasters, and is committed to promoting and facilitating the implementation of its universal access initiative. UN-SPIDER has promoted training for project managers through its network of regional support offices. Representatives of five regional support offices and UN-SPIDER attended the training in Frascati, Italy, from 26 to 28 June 2013.

36. The Office for Outer Space Affairs, through UN-SPIDER was invited to the meeting of the Committee of Experts on Global Geospatial Information Management, in Cambridge, United Kingdom of Great Britain and Northern Ireland, from 23 to 26 July 2013. The Office attended as co-chair of the United Nations Geographic Information Working Group for the period 2013-2014 and as a member of the Steering Committee of the United Nations Spatial Data Infrastructure. The Office submitted document E/C.20/2013/12, entitled "Activities on geospatial information within the United Nations system", presented the initiatives of the Geographic Information Working Group and the Spatial Data Infrastructure and highlighted complementarities with the Committee of Experts. A presentation of UN-SPIDER entitled "Current state of and challenges for the effective use of geospatial information for disaster management: lessons learned from the UN-SPIDER technical advisory missions" was delivered at the subsequent forum on global geospatial information management, held in Chengdu, China, from 15 to 17 October 2013.

37. UN-SPIDER was invited to attend the Semana Geomática 2013 congress at IGAC, in Bogota from 30 September to 4 October 2013, to review the use of space-based information in Colombia in early warning and emergency response activities, and to coordinate efforts with IGAC in its role as a UN-SPIDER regional support office.

38. The second United Nations International Strategy for Disaster Reduction (ISDR) Asia Partnership meeting for 2013 was held in Bangkok from 5 to 7 November 2013. UN-SPIDER was invited to make a presentation on the topic "Role of space-based information in the Hyogo Framework for Action and the post-2015 framework for disaster risk reduction: UN-SPIDER interventions".

39. In Hanoi, on 18 and 19 November 2013, Viet Nam hosted the Asia-Europe Meeting (ASEM) high-level event on disaster prevention and relief in response to



climate change, whose theme was “Strengthening Asia-Europe cooperation for disaster risk reduction and sustainable development”. UN-SPIDER was invited by the ASEM secretariat to make a presentation on the topic “Space technology to strengthen national disaster management efforts: UN-SPIDER interventions”.

40. UN-SPIDER was invited to attend the Intergovernmental Consultative Committee meeting at the Economic and Social Commission for Asia and the Pacific, in Bangkok, from 26 to 29 November 2013, which reviewed the progress of the Regional Space Applications Programme for Sustainable Development during the period 2012-2013 and developed the workplan for 2014-2015.

41. ISDR-Latin America and the Caribbean, the Coordination Center for the Prevention of Natural Disasters in Central America (CEPREDENAC) and Disaster Preparedness of the European Commission Humanitarian Aid and Civil Protection Directorate General (DIPECHO) organized a regional consultation and dissemination workshop on integral disaster risk management in Central America, in Panama City from 26 to 28 November 2013. The participants, including a representative of UN-SPIDER, took stock of recent advances regarding the implementation of the Central American regional policy on integrated disaster risk management.

## **B. Knowledge management**

42. Good knowledge management practices are promoted through the knowledge portal, but also through partnerships such as the regional support offices network of UN-SPIDER. In 2013, the regional support offices have shown deep involvement in supporting the activities of UN-SPIDER, including their contribution to the knowledge portal. As agreed during their meeting in Vienna in February 2012, the regional support offices continued to work on methodologies that will be made available through the knowledge portal. The objective of the recommended practices is to give guidance on the use of archived and up-to-date imagery to derive information for disaster risk reduction and emergency response. At their meeting in Vienna in February 2013, the regional support offices agreed to develop workflows, which they later presented at a meeting in Bonn in June 2013. The proposed methods include flood-plain delineation, flood mapping from synthetic aperture radar (SAR) imagery, crop yield prediction and vegetation monitoring for drought early warning. The UN-SPIDER Bonn office is coordinating this effort and has provided the regional support offices with a concept note and templates to guide them in the harmonized and user-friendly presentation of the methods. The first set of recommended practices is planned to be finalized during the next regional support office meeting, in Vienna in February 2014.

43. Continuing the efforts initiated in 2012, some regional support offices are preparing booklets on specific topics on the basis of their experiences. The specific topics are: “Considerations for effective use of space-based information to assess tsunami impact: lessons learned from the recent tsunami in Japan” (ADRC); “Considerations for effective use of space-based information to monitor massive flood disaster and its impact: lessons learned from Pakistan floods in 2010” (SUPARCO); and “Considerations for effective use of space-based information to assess drought at the national level: experiences from the Islamic Republic of Iran”

(ISA). LAPAN, in Indonesia, which joined the regional support office network in 2013, has also proposed to deliver a booklet on the applications of remote sensing for forest fire and land fire monitoring. Initially planned for 2013, the publication of the four booklets will be in 2014, as the larger than expected volume of materials prepared requires more editing and standardization than originally planned.

### **Knowledge portal**

44. The knowledge portal continues to provide the hosting environment for scientific and technical publications on the use of space-based information in disaster risk reduction and emergency response; information on emergency mechanisms set up by the space community to support emergency response activities; links to websites and portals that host satellite imagery, products such as digital elevation models and land-cover and land-use maps; and software packages used to process satellite imagery of various kinds. The portal serves as the gateway to the networks of regional support offices and national focal points, as well as to the websites operated by many institutions around the world dedicated to space applications, disaster risk management and emergency response. The portal also serves as the main dissemination tool for all activities carried out by the programme, including their outputs. The portal is more and more recognized as a gateway to space-based information, as clearly evidenced by the popularity and utility of the resource pages set up to cover a variety of themes, events and useful products.

45. In 2012, an in-depth evaluation of the portal was made through interviews and surveys. The results were translated into a road map for the future development and consolidation of the portal, which now guides the work of the programme under the UN-SPIDER Bonn office, where the portal is hosted and administered.

46. Between 1 September 2012 and 31 August 2013, the monthly visits to the knowledge portal experienced a general upward trend, averaging about 10,000 visits per month in the reporting period. The number of content items in the knowledge portal continued to increase in the period from 1 September 2012 to 31 August 2013. In total, 661 new content items were created and published in that time frame. As at 31 August 2013, the knowledge portal contained 4,130 content items.

47. In the period from 1 September 2012 to 31 August 2013, the number of visitors from Africa and Latin America and the Caribbean has continued to increase, and the number of visitors from Europe, North America and Asia rose substantially in the same period. Statistics indicate that the number of visitors from Asia and Europe nearly doubled from spring 2012 to spring 2013.

48. For specific events, when a high load is anticipated, as in ongoing disaster relief activities, a page on a different server can be quickly activated. During the floods in Central Europe in summer 2013, this method was used to offer the full range of space-based products to the public. The page was made available using Google Sites (<https://sites.google.com/site/unspiderfloodseurope/>).

### C. Technical advisory support

49. 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 support that can include: technical advisory missions involving experts from space and disaster management agencies from other countries and relevant international and regional organizations and institutions; technical advice to national institutions by means of meetings, teleconferences, videoconferences, etc.; facilitating direct cooperation between national institutions and providers of space-based information and solutions; and support in accessing space-based information for emergency response. Detailed information on technical advisory support activities carried out in 2013 in the framework of UN-SPIDER is contained in A/AC.105/1056.

50. Four missions organized and led by UN-SPIDER served to evaluate the current and potential use of space-based information in all aspects of disaster management and to strengthen disaster risk management by providing better access to space-based information for disaster risk reduction and response. The recommendations from those missions cover various issues related to policy and coordination, data access, data availability, data-sharing, capacity-building and institutional strengthening.

51. In 2013, four missions for advisory support were organized:

(a) In Viet Nam, a technical advisory mission took place from 25 to 29 March 2013 and was conducted by 12 experts from UN-SPIDER, CANEUS International (Canada-Europe-Americas-Africa-Asia-Oceania), the Centre for Large Space Structures and Systems (Canada), the National Centre for Space Studies/National Centre for Scientific Research/Université Paul Sabatier (France), the South China Sea Institute of Oceanology, the Chinese Academy of Sciences, the Geomatics Research, Diffusion and Information Society (Spain), GREEN Mindanao (Philippines), the Pacific Disaster Center (PDC) (United States) and ITC. The Department of Earth Systems Analysis (Netherlands), the Center for Interdisciplinary Geospatial Information Technologies of Delta State University (United States) and Beijing Normal University (China) were also part of the team;

(b) In Indonesia, UN-SPIDER and LAPAN organized a stakeholders' meeting on the utilization of space-based information for disaster risk management in Jakarta on 3 September 2013. Approximately 25 stakeholders from various agencies attended the meeting. The following institutions took part in the meeting: National Agency for Disaster Management (Badan Penanggulangan Bencana Daerah), Indonesian provincial disaster mitigation agencies, Badan Meteorologi, Klimatologi, dan Geofisika, Badan Informasi Geospasial, National Survey and Mapping Agency of Indonesia, World Food Programme (WFP), the Office for the Coordination of Humanitarian Affairs, NDRCC, DLR, PDC and Association of Southeast Asian Nations Coordinating Centre for Humanitarian Assistance on disaster management;

(c) In Malawi, a technical advisory mission was requested by the Department of Disaster Management Affairs and was carried out from 14 to 18 October with the support of the Economic Commission for Africa, the Humanitarian OpenStreetMap Team, the French Research Institute for Exploitation

of the Sea, the Technical University of Vienna, the Group on Earth Observations, RCMRD and NDRCC;

(d) In Ghana, a technical advisory mission took place from 25 to 29 November, upon the invitation of the National Disaster Management Organization. The mission was carried out with the support of the United Nations University, the United Nations Environment Programme, NASRDA, the Met Office of the United Kingdom, NDRCC, SWF and the University of the Free State (South Africa).

#### **D. Activities to follow up technical advisory missions**

##### **Space-based technologies for disaster risk management workshop and training course, the Sudan, 5 to 9 May 2013**

52. As a follow-up to the UN-SPIDER technical advisory mission carried out in the Sudan in 2011, a workshop focusing on space-based technologies for disaster risk management and a training course were conducted in Khartoum from 5 to 9 May 2013. Those activities were jointly organized with the Remote Sensing Authority (RSA), RCMRD, the Sudan Civil Defence General Administration, the Directorate of Public Health and Emergency of the Ministry of Health, the Ministry of Agriculture and Irrigation and the Sudan Meteorological Authority.

53. Over 120 participants from the Government, non-governmental organizations, academia, United Nations organizations and private companies in the Sudan participated in the one-day workshop. About 20 participants from RSA, the Meteorological Authority, the Ministry of Defence, the Ministry of Interior, the Ministry of Health and Ministry of Agriculture and Irrigation of the Sudan and local United Nations offices (such as those of WFP and UNDP) attended the training course. Five experts from UN-SPIDER, the China Institute of Water Resources and Hydropower Research and RCMRD provided the training.

##### **Training course on space technology for flood hazard mapping, flood forecasting and rapid mapping, Bangladesh, 12 to 16 May 2013**

54. The training course on the topic “Space technology for flood hazard mapping, flood forecast and rapid mapping in Bangladesh” was jointly organized with the Ministry of Disaster Management and Relief, the Comprehensive Disaster Management Programme and the Space Research and Remote Sensing Organization (SPARSO) of Bangladesh, as a follow-up to the UN-SPIDER technical advisory mission to Bangladesh in 2011.

55. The course covered a wide range of topics, such as the role of Earth observation in disaster management, flood hotspot assessment, flood hazard and risk mapping, and multi-hazard risk and vulnerability assessment. The course included hands-on sessions to allow participants to develop skills in mapping and modelling floods.

56. Experts from the following organizations conducted the training sessions: UN-SPIDER, IWMI, NDRCC, ICIMOD, the Economic and Social Commission for Asia and the Pacific, PDC, the Asian Disaster Preparedness Centre and SPARSO.

Some 20 officers from 17 organizations in Bangladesh participated in the training programme.

**Capacity-building and follow-up activities in the Dominican Republic, 13 to 17 May 2013**

57. As a follow-up to the two preceding advisory support missions to the Dominican Republic, in 2010 and 2011, UN-SPIDER organized a one-week training course to strengthen the remote sensing capacities of the inter-institutional Geo-Spatial Information Team for Risk Management to derive flood-related information from satellite imagery. The training course was organized with the National Emergency Commission and three regional support offices: IGAC, CATHALAC and CONAE.

58. Lectures and hands-on sessions were provided by experts from CATHALAC, IGAC and UN-SPIDER. Topics included: introduction to remote sensing for disaster risk management and emergency response; acquisition of satellite data and useful data products for flooding; pre-processing and supervised and unsupervised classification of multispectral images; calculation of indices and change detection with multispectral images; introduction to radar data; use of digital elevation models for hydrologic modelling; use of thermal data for change detection; and introduction to the web portal.

**National training programme on disaster mapping using space technology, Mozambique, 4 to 8 November 2013**

59. As a follow-up to the recommendations of the technical advisory mission to Mozambique conducted in October 2012, UN-SPIDER and UNDP-Mozambique jointly organized in Maputo a national training course on disaster mapping using space technology. The course took place at the Eduardo Mondlane University.

60. The course targeted more than 20 participants from the following institutions: Instituto Nacional de Gestão das Calamidades, Instituto de Investigação Agrária de Moçambique, Centro Nacional de Cartografia e Teledetecção, Administração Regional de Aguas do Sul, Instituto Nacional de Meteorologia, Direcção Nacional de Planeamento e Ordenamento Territorial, Municipality of Maputo, Universidade Técnica de Moçambique and Eduardo Mondlane University.

61. The experts from UN-SPIDER, the Cologne University of Applied Sciences and NDRCC introduced the participants to the concepts of hazard, vulnerability and risk; the basics of Earth observation satellites; geodata for disaster management; rapid mapping and functioning with regard to operational aspects of the International Charter on Space and Major Disasters; and other topics. Hands-on exercises were provided on flood forecasting, flood detection, drought monitoring and rapid mapping of disasters.

**E. Support during emergencies**

62. UN-SPIDER provided support during several emergencies: for activating the International Charter on Space and Major Disasters and coordinating with end users during typhoon Bopha in Palau and the Philippines; providing satellite images

through ISRO during typhoon Haiyan in the Philippines; and providing products to the Government of Iraq for flood monitoring in northern Iraq and Baghdad, with the assistance of ISRO and NDRCC.

## **F. Activities carried out by the regional support offices**

63. UN-SPIDER held the fourth annual meeting of regional support offices during the session of the Scientific and Technical Subcommittee (Vienna, 11 and 12 February 2013), where the activities implemented with regional support offices in 2012 were reviewed and the plan for joint activities in 2013 was drawn up. The meeting recommended, inter alia:

(a) Increased involvement of regional support offices in the UN-SPIDER knowledge portal;

(b) Improving the sharing of information on relevant planned activities so that coordination can be more effective and resources used more efficiently;

(c) More attention to social networking;

(d) Consideration of the pooling satellite imagery and data resources with a view to sharing data across countries or regions where regional support offices are active and improving access to archived data;

(e) Preparation of an online guide to where and how to discover and access data that can be downloaded and shared with other regional support offices;

(f) Looking at means of using precipitation satellite data to provide information to those countries that do not have modern meteorology services or the required technology;

(g) Continuously and jointly reviewing the agreed programme of work and identifying areas and actions where regional support offices support could make a concrete difference and lead to progress;

(h) Designing and implementing an evaluation method, including a definition of responsibilities and of mechanisms to measure the impacts of technical advisory support and technical advisory missions;

(i) Aiming to implement the project on use of archived satellite imagery together with UN-SPIDER, with the milestones discussed and agreed.

64. As listed in paragraph 10 above, in 2013 UN-SPIDER expanded its network of regional support offices with three new partners signing agreements: ICIMOD, LAPAN and EMERCOM.

65. Six officers from NASRDA participated in training for project managers, related to the International Charter on Space and Major Disasters, in Abuja from 8 to 10 April 2013. That regional support office also participated in the 2013 annual consultation of the regional committee for disaster management in West Africa.

66. In early April 2013, an operational remote sensing forest fire detection and monitoring system for Nepal was officially launched in Kathmandu. The system is installed on the rooftop of ICIMOD. That regional support office also published an

overview of the events following the heavy monsoon rains in India and Nepal in 2013, which caused heavy flooding.

67. In late August and early September, Pakistan was facing medium to heavy flooding of all the major rivers of the country. To monitor the situation, SUPARCO started generating daily flood inundation maps based on MODIS images from Aqua and Terra satellites.

68. ISA and SUPARCO, through the Inter-Islamic Network on Space Sciences and Technology, jointly held a workshop on space applications for disaster risk reduction and management at ISA, in Tehran, from 7 to 19 September 2013.

69. The regional support office of Romania is currently implementing an updated version of the national emergency service in the framework of the Platform for Geoinformation in Support of Disaster Management (GEODIM) project. GEODIM complements the existing emergency mechanisms through a unique Romanian downstream emergency response service.

70. The regional support offices continue with their activities regarding planned contributions (see A/AC.105/2012/CRP.18), including the development of recommended practices for the UN-SPIDER knowledge portal. ISA, RCMRD, the Space Research Institute (SRI) of NASU-SSAU and CATHALAC have been working on methodologies for drought monitoring and assessment and crop yield prediction. NASRDA, CONAE, IGAC, and SRI NASU-SSAU have been working on methodologies for flood susceptibility mapping and SAR flood mapping. SUPARCO has been working on the identification of erosion hotspots. IGAC of Colombia submitted a booklet on the estimation and cartographic depiction of flood and mass movement hazards in Corantioquia, with the use of geospatial technologies, which targets the lower basin of the Cauca and Nechi rivers. IGAC also elaborated guidelines for the description and correction of Landsat 8 products.

71. EMERCOM and the Russian Federal Space Agency organized for the Asia-Pacific Economic Cooperation (APEC) in Bali, Indonesia, on 30 and 31 October 2013, a workshop on applications of satellite technologies for emergency preparedness, management and response in the Asia-Pacific Region. UN-SPIDER was invited by the APEC secretariat to make a presentation on its work and workplan. That was the first opportunity for a close collaboration with EMERCOM, the most recent entity to join the regional support office network.

#### **IV. Voluntary contributions**

72. The successful implementation of activities benefited from the support and voluntary contributions (financial and in-kind) received from governments and private sector entities, the main ones being:

(a) The Government of Austria, which contributed €150,000 through the Austrian Research Promotion Agency;

(b) The Federal Ministry for European and International Affairs of Austria, which financed the services of an associate expert;

(c) The Government of Germany, which contributed €150,000 for the UN-SPIDER activities generated from the Bonn office and financed the services of two associate experts in 2013;

(d) The Government of China, which contributed RMB 1,250,000 a year to support the activities of the UN-SPIDER office in Beijing and the services of two senior experts, from NDRCC and CNSA (on a non-reimbursable loan basis);

(e) DLR, which provided the services of one senior expert (on a non-reimbursable loan basis) for the first half of 2013;

(f) SWF, which contributed to two events organized by UN-SPIDER;

(g) CNSA, APSCO and DigitalGlobe, which contributed to the annual conference organized by UN-SPIDER in Beijing.

73. The present report and the report on technical advisory support activities carried out in 2013 in the framework of UN-SPIDER (A/AC.105/1056) refer to all collaborations with a wide range of institutions that assisted the Office for Outer Space Affairs in implementing the UN-SPIDER programme in 2013. Their in-kind and sometimes financial contributions are recognized as central to the success of the programme in 2013 and also demonstrate the value of UN-SPIDER in building partnerships to improve the capabilities of national and regional institutions with a role in disaster risk reduction and emergency response in developing countries.