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Committee on the Peaceful Uses of Outer Space

Report on activities carried out in 2014 in the framework of the United Nations Platform for Space-based Information for Disaster Management and Emergency Response

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 under the UN-SPIDER programme in 2014 with regard to the workplan for the biennium 2014-2015 (A/AC.105/C.1/2013/CRP.6).

4. In its resolution 69/85, the General Assembly noted with satisfaction the significant achievements made and the advisory support provided to more than 30 Member States within the framework of UN-SPIDER.

5. The present report covers all the activities of the UN-SPIDER programme for 2014, and, to avoid unnecessary duplication, includes the full reporting on advisory support. Other reports from UN-SPIDER for 2014 cover the increasing efforts in knowledge management, particularly through the development of the UN-SPIDER

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knowledge portal[1] (A/AC.105/1075); the activities of the UN-SPIDER network of regional support offices (A/AC.105/1079); the report on the United Nations/Germany Expert Meeting on the Use of Space-based Information for Flood and Drought Risk Reduction (A/AC.105/1074); and the report on the United Nations International Conference on Space-based Technologies for Disaster Management: Multi-hazard Disaster Risk Assessment (A/AC.105/1076).

II. Organizational framework

6. The organizational framework of UN-SPIDER has three cornerstones: UN-SPIDER staff, the network of regional support offices and the national focal points. It 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. The knowledge portal has become one of the most recognized services of UN-SPIDER, as it is aimed at hosting information on all activities conducted by the programme and relevant activities conducted by the disaster risk, emergency response and space communities. Reflecting its relevance to the programme, the number of services to which the portal gives access will, starting with the biennium 2016-2017, become one of the measurements of the programme's progress within the strategic framework of the Office for Outer Space Affairs.

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

7. 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 is assisted by a senior programme officer, who is responsible for planning, coordinating and implementing all UN-SPIDER activities. The senior programme officer is supported by two programme officers who lead the activities of the UN-SPIDER offices in Bonn, Germany, and Beijing, and a programme officer in Vienna who supports the outreach and capacity-building activities and the advisory services provided under the programme.

8. In 2014, 13 staff members worked in the framework of UN-SPIDER. They were distributed as follows:

(a) In Vienna: a senior programme officer, a programme officer responsible for outreach, capacity-building activities and emergency response support, and a team assistant who assisted with the administrative tasks of the programme. From January to March 2014, the programme officer continued to be 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 was hired on a temporary assignment contract;

[1] Further information is available at www.un-spider.org.

(b) In Bonn: a programme officer for leading the activities of the UN-SPIDER office in Bonn; one expert provided by the German Aerospace Centre (DLR), as a non-reimbursable loan, from September to December 2014 for supporting the implementation of knowledge management and advisory support activities; an associate expert, also provided by the Government of Germany, for supporting the compilation and dissemination of information and the maintenance of the content of the knowledge portal; another associate expert, also provided by the Government of Germany, for supporting remote sensing advisory services. The administration and maintenance of the portal was supported by a third associate expert, who was on a temporary assignment supported by funding from the Government of Germany;

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

9. The post of associate expert at the UN-SPIDER office in Vienna was left vacant in April 2014, and Member States were invited to propose candidates through their Junior Programme Officer programmes.[2]

10. In 2014 the programme also benefited from the regular support of 14 interns in its Beijing, Bonn and Vienna offices for uploading reference material to the portal, doing research for the advisory services provided, and assisting in the organization of events.

B. Network of regional support offices

11. 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. In its resolution 69/85, the General Assembly noted the valuable contributions of the network of regional support offices.

12. The 16 UN-SPIDER regional support offices[3] are currently being hosted by the following national organizations: Algerian Space Agency (ASAL); Iranian Space Agency (ISA); National Commission for Space Activities of Argentina (CONAE); Agustín Codazzi Geographic Institute of Colombia (IGAC); Research Institute for Remote Sensing at Károly Róbert University of Hungary (RIRS); National Institute of Aeronautics and Space of Indonesia (LAPAN); National Space Research and Development Agency of Nigeria (NASRDA); Space and Upper Atmosphere Research Commission of Pakistan (SUPARCO); Romanian Space Agency (ROSA); Agency for Support and Coordination of Russian Participation in International Humanitarian Operations (EMERCOM); and State Space Agency of Ukraine (NASU-SSAU). They are also hosted by the following regional organizations: Asian Disaster Reduction Centre (ADRC), based in Kobe, Japan; International Centre for

[2] Further information is available at http://esa.un.org/techcoop/associateexperts/index.html.

[3] Further information is available at www.un-spider.org/network/regional-support-offices.

Integrated Mountain Development (ICIMOD), based in Kathmandu; Regional Centre for Mapping of Resources for Development (RCMRD), based in Nairobi; University of the West Indies, based in Saint Augustine, Trinidad and Tobago; and Water Centre for the Humid Tropics of Latin America and the Caribbean (CATHALAC), based in Panama City. Negotiations are under way with various institutions to further increase the number of members and to consolidate the regional coverage by institutions specialized in Earth observation, disaster risk reduction and emergency response.

13. The network of regional support offices should be able to contribute to any of the activities included in the UN-SPIDER workplan by taking on the responsibility for funding and for implementing specific activities, jointly and in coordination with UN-SPIDER. Such activities can include: hosting a regional workshop, promoting capacity-building activities in a particular region, contributing to missions to a particular region in support of national disaster management, supporting national and regional vulnerability assessments, providing mapping support during emergencies, contributing to the systematic compilation of relevant information (including the development of country profiles and the compilation of geospatial databases), supporting awareness-raising campaigns and promoting the establishment of regional and national networks of experts.

14. The workplan of the network (A/AC.105/2014/CRP.11) was submitted to the Committee on the Peaceful Uses of Outer Space at its fifty-seventh session.

15. The report of the fifth meeting of the network, held on 13 and 14 February 2014 (A/AC.105/2014/CRP.10) was also submitted to the Committee at its fifty-seventh session. The two-day meeting allowed, inter alia:

(a) Regional support offices to share information on the activities they held in 2013 and to discuss activities proposed for 2014;

(b) UN-SPIDER staff to review, together with the regional support offices, ongoing activities (such as technical advisory support, outreach and the knowledge portal), the role of the regional support offices and the content of the space application matrix within the knowledge portal;

(c) Regional support offices to comment on the current status of booklets on lessons learned and recommended practices, and future plans to cooperate in the development of such booklets;

(d) UN-SPIDER to continue discussions on a dedicated UN-SPIDER strategy for regional support offices and on the involvement of the regional support offices in the monitoring of the impact of UN-SPIDER advisory services and of the support provided during emergencies;

(e) Participants to develop a common understanding of recent developments and trends in geovisualization based on open-source solutions.

16. The Office for Outer Space Affairs is a cooperating body under 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). As many of the UN-SPIDER regional support offices fulfil the requirements to become Charter project managers, use of the network is being promoted among the Charter’s partners so that they can participate in relevant

training activities. UN-SPIDER is now coordinating the inclusion of project manager training in the sixth regional support offices meeting in 2015.

C. National focal points

17. UN-SPIDER has developed a network of focal points within national disaster management agencies to work with UN-SPIDER staff in guiding national disaster management planning and policies and coordinating the implementation of specific national activities that incorporate space-based technology solutions in support of disaster management. Forty-six Member States have appointed national focal points.[4]

18. The universal access initiative of the International Charter on Space and Major Disasters has been designed to further strengthen the Charter's contribution to disaster management worldwide, and is being implemented gradually. Following the coordination between the secretariats of the Office for Outer Space Affairs and of the Charter, a list of national focal points of UN-SPIDER was shared in 2013 so that universal access and the registration and training of authorized users could be promoted worldwide. That list was used recently by the China National Space Administration (CNSA) during its term as secretariat of the Charter.

III. Activities carried out in 2014

19. The work carried out under the UN-SPIDER programme in 2014 followed the workplan for the biennium 2014-2015 and was implemented within the resources allocated through the United Nations regular budget and with voluntary and in-kind contributions from Member States and collaborating entities.

A. Outreach and networking activities

20. The targets for 2014 defined in the workplan of the UN-SPIDER programme were met. The proposed workshops, expert meetings and training courses were organized and conducted. In addition, UN-SPIDER staff participated in a number of international conferences and ensured the participation of expert speakers.

21. Raising awareness of the benefits of space-based tools and applications for disaster risk reduction and emergency response is a constant concern of the UN-SPIDER team. A considerable number of concrete activities are developed within the programme and, where relevant and financial resources can be mobilized, the team participates regularly in regional and global events. A special effort is made to reduce the cost of those activities by grouping travel, negotiating agreements with venues and seeking voluntary contributions by organizers of events whenever possible.

[4] Further information is available at www.un-spider.org/network/national-focal-points.

1. Events organized or co-organized by UN-SPIDER

22. Three major activities were organized by the UN-SPIDER teams of the Beijing and Bonn offices and two were co-organized in the Asia-Pacific region.

(a) Central American expert meeting on the use of space-based information in early warning systems, San Salvador, 31 March and 1 April 2014

23. Recognizing the role that satellite applications can play in the context of early warning systems, the UN-SPIDER programme, the Coordination Centre for Natural Disaster Reduction in Central America (CEPREDENAC) and the Secure World Foundation (SWF) of the United States of America held a meeting that brought together 30 experts from Argentina, Brazil, Costa Rica, Colombia, Dominican Republic, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama and the United Nations. The regional expert meeting allowed participants to:

(a) Develop a better appreciation of advances and technologies developed by the space community for use in comprehensive risk management and early warning;

(b) Get an overview of the use of satellite technology and geospatial information in early warning systems;

(c) Exchange information about efforts being made in Central America in the context of early warning systems, and about the latest advances in the use of satellite imagery applications in the region;

(d) Identify strengths, weaknesses and needs in institutional capacity-building in connection with the use of satellite technology and geospatial information;

(e) Identify strategies and activities at the regional and national levels to facilitate the use of the relevant information in early warning systems;

(f) Define a workplan focusing on measures to increase the institutional capacity of the countries of the region;

(g) Request that UN-SPIDER, CEPREDENAC, other United Nations entities, other institutions that focus on the use of geospatial information, and experts from Central America continue their coordination to promote the use of satellite imagery applications in early warning systems in the region.

(b) United Nations/Germany Expert Meeting on the Use of Space-based Information for Flood and Drought Risk Reduction, Bonn, Germany, 5 and 6 June 2014

24. The expert meeting was organized by the UN-SPIDER programme in cooperation with DLR and was supported by the German Federal Ministry for Economic Affairs and Energy and SWF. It was attended by 57 experts and professionals from 18 Member States. Altogether, participants represented 44 national, regional and international organizations belonging to the United Nations system, the space, disaster risk management and emergency response communities, knowledge transfer and academic institutions, and internationally active private companies.

25. The expert meeting allowed participants, inter alia:

(a) To become aware of recent advances in the use of space-based information in flood and drought risk reduction;

(b) To become aware of UN-SPIDER efforts related to the upcoming Third World Conference on Disaster Risk Reduction and to identify ways and means to become engaged in such efforts;

(c) To share their experiences and to provide their suggestions and recommendations regarding the use of space-based information in flood and drought risk reduction.

26. The expert meeting allowed UN-SPIDER, inter alia:

(a) To continue connecting the space, disaster risk management and emergency response communities;

(b) To collect a variety of suggestions and recommendations from experts regarding the use of space-based information in flood and drought risk reduction;

(c) To compile experiences and lessons learned regarding the current and potential use of space-based information in flood and drought risk reduction;

(d) To identify knowledge management strategies that can facilitate access to and use of space-based information in flood and drought risk reduction.

27. The main recommendations and observations of the expert meeting were:

(a) The assessment of hazards, exposure and vulnerability related to floods and droughts benefits from the combined use of space-based and ground-based data;

(b) While high-resolution data can be used to assess the exposure of buildings, including critical infrastructure, moderate-resolution data can be used to track the effects of droughts on crops at the national level;

(c) In recent years several space agencies have changed their policies regarding access to data, providing access to satellite imagery free of charge. UN-SPIDER should bring stakeholders together to develop procedures that make use of such data in the context of disaster risk reduction;

(d) The combination of archived and up-to-date satellite imagery offers disaster risk managers the opportunity to visualize how exposure of vulnerable elements has changed in recent decades;

(e) There is a need to lobby national governments to highlight the use of geospatial and space-based information in the post-2015 framework for disaster risk reduction.

(c) United Nations International Conference on Space-based Technologies for Disaster Management: Multi-hazard Disaster Risk Assessment, Beijing, 15-17 September 2014

28. The conference was jointly organized by the UN-SPIDER programme and the Ministry of Civil Affairs of China in collaboration with the Ministry of Foreign Affairs, the Ministry of Finance, CNSA and the Asia-Pacific Space Cooperation Organization (APSCO), and was given support by DigitalGlobe. It was aimed at

promoting the role of space-based and geospatial information in multi-hazard disaster risk assessment.

29. The conference was attended by 110 participants from 32 Member States: Armenia, Australia, Austria, Bangladesh, Barbados, Bhutan, Cambodia, China, Germany, Ghana, India, Indonesia, Iran (Islamic Republic of), Kazakhstan, Kenya, Lao People's Democratic Republic, Malawi, Mongolia, Mozambique, Myanmar, Namibia, Nigeria, Nepal, Pakistan, Peru, Russian Federation, Singapore, Sudan, Thailand, Turkey, United States and Viet Nam. The participants represented 57 national, regional and international organizations belonging to the United Nations system, the space, disaster risk management and emergency response communities, academic institutions and internationally active private companies. The following United Nations, regional and international organizations attended the conference: United Nations Development Programme (UNDP), Office for the Coordination of Humanitarian Affairs, APSCO, Association of Southeast Asian Nations Humanitarian Assistance Centre (ASEAN AHA Centre), RCMRD and Asian Disaster Preparedness Centre.

30. The main outcomes of the conference were:

(a) The National Disaster Reduction Centre of China (NDRCC) signed a memorandum of understanding with the Sudan Remote Sensing Authority and RCMRD to establish a drought monitoring service in the Sudan;

(b) Participants renewed their focus on the uses of space-based information in multi-hazard risk assessment;

(c) Links were established between disaster managers and geospatial experts;

(d) Participants learned about opportunities to build capacity and collaborate;

(e) Participants were taken on institutional visits to see state-of-the-art facilities housing disaster management information infrastructure.

31. During all annual conferences organized by UN-SPIDER in Beijing, visits were organized to facilities in China to expose participants to state-of-the-art satellite data collection, archiving, applications and dissemination. One of the outcomes of those visits was a request from the delegation of Mozambique for more information about building an operations centre. UN-SPIDER provided the delegation of Mozambique an opportunity to visit facilities of the Space Star Technology Company of the China Academy of Space Technology, the company instrumental in building such facilities.

32. The key recommendations made during the working group sessions were:

(a) Countries should take steps to use a combination of space-based information, geospatial information and ground data in multi-hazard risk assessments and vulnerability assessments;

(b) UN-SPIDER and international organizations should continue their efforts to create standard mechanisms and procedures for sharing satellite data worldwide;

(c) UN-SPIDER should continue to provide a platform through its outreach events, including international conferences, workshops and expert meetings, to facilitate cooperation among government agencies at the national level.

Regional workshop entitled "Development of mechanisms for acquisition and utilization of space-based information during emergency response" for participants from member States of the Association of Southeast Asian Nations (ASEAN), Yogyakarta, Indonesia, 15-17 April 2014

33. The workshop was jointly conducted by UN-SPIDER and its regional support office in Indonesia, LAPAN, and was supported by the ASEAN AHA Centre, the Economic and Social Commission for Asia and the Pacific (ESCAP) and Australian AID.

34. The workshop addressed the following four objectives:

(a) Identifying requirements and criteria to respond to major disasters by making effective use of international mechanisms that provide space-based information during emergencies;

(b) Leveraging United Nations and other initiatives for disasters that cannot be covered through international mechanisms;

(c) Strengthening emergency response preparedness by identifying gaps and needs related to capacity-building, databases, financing, institutional coordination, etc.;

(d) Preparing rapid mapping products and their dissemination to end users.

35. Fifty-five participants from eight ASEAN member States together with disaster managers from provinces of Indonesia participated in the workshop. Experts from the Pacific Disaster Centre, NDRCC, the Japan Aerospace Exploration Agency (JAXA), ADRC, DigitalGlobe and LAPAN also participated in the workshop.

36. At the end of the workshop, a draft document entitled "Mechanisms for acquisition and utilization of space-based information during emergency response" was prepared and discussed with the participants.

(d) Sixth Asian Ministerial Conference on Disaster Risk Reduction pre-conference event, 22 June 2014, Bangkok

37. UN-SPIDER and the Global Facility for Disaster Reduction and Recovery of the World Bank organized a pre-conference event in Bangkok for the Sixth Asian Ministerial Conference on Disaster Risk Reduction. The event, entitled "Investing in geospatial and space-based information to support disaster risk reduction and climate change adaptation investment", was attended by over 55 international participants. Experts from UN-SPIDER, ICIMOD, ADRC and JAXA gave technical presentations. Participants from Bangladesh, China and Indonesia gave presentations about their countries' experiences. The participants also discussed how Earth observation could best be included in the post-2015 framework for disaster risk reduction.

38. The pre-event provided input to the consultation conducted by scientific, academic and research stakeholders and to the technical session of the Conference,

and thus contributed to the final outcome document of the Conference, the "Bangkok declaration on disaster risk reduction in Asia and the Pacific".

2. Events organized by the Office for Outer Space Affairs

39. It is important for UN-SPIDER to inform States members of the Committee on the Peaceful Uses of Outer Space about how the Office for Outer Space Affairs promotes the use of Earth observation for disaster risk reduction and emergency response. Space agencies are well represented in the Committee, but this is not true for all national authorities with responsibility for disaster management. Hence the importance of developing connections with them. The UN-SPIDER team has therefore ensured a presence in four key events organized by the Office for Outer Space Affairs. Presentations on the development of the knowledge portal and on the benefits of using Earth observation in disaster risk reduction and emergency response were given on the following occasions:

(a) The fifty-first session of the Scientific and Technical Subcommittee of the Committee and the fifth annual meeting of UN-SPIDER regional support offices, Vienna, 10-21 February 2014;

(b) The thirty-fourth session of the Inter-Agency Meeting on Outer Space Activities (UN-Space) and the fourteenth plenary meeting of the United Nations Geographic Information Working Group (UNGIWG), New York, 14-16 May 2014;

(c) The fifty-seventh session of the Committee, Vienna, 11-20 June 2014;

(d) United Nations/China/APSCO Workshop on Space Law, Beijing, 17-21 November 2014.

3. Events with a focus on disaster risk reduction

40. In the upcoming Third World Conference on Disaster Risk Reduction, to be held in Sendai, Japan, in March 2015, Member States will be requested to continue to be committed to reducing the existing level of risk, to preventing new risks from arising and existing risks from increasing, and to enhancing the resilience of communities exposed to risk. In the new framework for disaster risk reduction to be promoted at that Conference, Member States will also be requested to take concrete action to achieve those goals and to monitor and report on advances in disaster risk reduction.

41. Taking those issues into consideration, several United Nations entities, regional and international organizations, space agencies, and Member States have joined forces under the leadership of the Office for Outer Space Affairs to coordinate the support countries in the implementation of the new framework for disaster risk reduction. They will conduct an official working session during the Conference with the aim of:

(a) Showcasing how geospatial and space-based applications have contributed to existing priority areas of the Hyogo Framework for Action;

(b) Highlighting how space agencies, regional and international organizations dedicated to Earth observation and United Nations organizations will work together to facilitate access to Earth observation data and information;

(c) Presenting guidelines on how Member States can use space-based and geospatial applications to monitor indicators to be proposed in the new framework for disaster risk reduction.

42. The preparations for this global milestone are a long and complex regional and global process. They include the drafting of the outcome document, which will define the new goals for disaster risk reduction and set out indicators for measuring and monitoring the progress of Member States. The UN-SPIDER team, with the close support of the Director of the Office for Outer Space Affairs, has been participating in the key preparatory events in 2014 to ensure that, wherever relevant, Earth observation is included in Conference documents, forums and platforms that will contribute to the global agreement on goals and indicators for disaster risk reduction for the next 20 years. Those are:

(a) The first and second sessions of the Preparatory Committee, Geneva, 14 and 15 July 2014 and 17 and 18 November 2014, and the United Nations coordination meeting for the Third World Conference on Disaster Risk Reduction, Geneva, 2 September 2014;

(b) The United Nations International Strategy for Disaster Reduction (ISDR) Asia Partnership meeting, Bangkok, 22-25 April 2014;

(c) The fourth session of the Regional Platform for Disaster Risk Reduction of the Americas, Guayaquil, Ecuador, 27-29 May 2014;

(d) The international conference entitled “New partnerships for disaster risk management”, Berlin, 16 June 2014;

(e) The Sixth Asian Ministerial Conference on Disaster Risk Reduction, Bangkok, 22-26 June 2014;

(f) The forum of the Understanding Risk Network entitled “Producing actionable information”, London, 30 June-4 July 2014;

(g) The meeting entitled “Policymakers dialogue and capacity development for disaster risk reduction and management in Asia and the Pacific: harnessing information and space technology and the Geographical Information System”, Bangkok, 23-25 September 2014;

(h) The design and planning workshop held for the project of the Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific and Cultural Organization (UNESCO) entitled “Enhancing tsunami risk assessment and management, strengthening policy support and developing guidelines for tsunami exercises in Indian Ocean countries”, Moratuwa, Sri Lanka, 29 September-1 October 2014.

4. Events with a focus on emergency response

43. Space-based tools and applications now provide a wide range of services to responders worldwide, but in many countries where the institutional structures are recent, knowledge about their benefits and how to best take advantage of them is still too limited. In 2014 UN-SPIDER continued to expand the content of the knowledge portal and improve access to emergency response-related information. Coordination with key technical groups and regional bodies is important for UN-SPIDER, in order to raise awareness about countries’ requirements, and

increases their ability to find and use relevant Earth observation data and products in a timely manner. The five events below were prioritized:

(a) Thirteenth ASEAN regional forum intersessional meeting on disaster relief, Chengdu, China, 27 and 28 February 2014;

(b) Workshop entitled "Introduction to management concepts in crisis situations for the Commonwealth of Independent States (CIS)", Moscow, 25 and 26 March 2014;

(c) ASEAN workshop entitled "Development of mechanisms for acquisition and utilization of space-based information during emergency response", Yogyakarta, Indonesia, 15-17 April 2014;

(d) Annual meeting of the International Working Group on Satellite based Emergency Mapping (IWG-SEM), Munich, Germany, 20 and 21 May 2014;

(e) Workshop entitled "Bridging information and communication technologies (ICT) and the Environment" held at the Central European University, Budapest, 7-11 July 2014;

(f) Meeting of the board of the International Charter on Space and Major Disasters (at which the annual report of the Office for Outer Space Affairs was presented by video link), Incheon, Republic of Korea, 16 October 2014.

5. Inter-agency coordination and other forms of outreach

44. Fostering collaboration and fundraising are also important areas of work of UN-SPIDER. The following events were attended to communicate the objectives of the programme, often at the invitation of the organizers and with their financial support:

(a) The Central American Integration System (SICA) group of ambassadors of Central America and the Dominican Republic to present UN-SPIDER work in the region; and visit to the German Research Centre for Geosciences (GFZ) and the German Federal Ministry for Economic Cooperation and Development, Berlin, 8 and 9 May 2014;

(b) The Open Geospatial Consortium (OGC), Geneva, 11 and 12 June 2014;

(c) Third Copernicus national user forum, a side event to the European Space Solutions conference, Prague, 11-13 June 2014;

(d) Toulouse Space Show 2014, Toulouse, France, 30 June-2 July 2014;

(e) Symposium entitled "AGIT 2014: Geospatial innovation for society", Salzburg, Austria, 2-4 July 2014;

(f) Environmental Systems Research Institute (ESRI) user conference and visit to agencies and institutions involved in disaster management and emergency response, San Diego, United States, 14-18 July 2014;

(g) Concluding meeting of the twenty-second Organization for Security and Cooperation in Europe (OSCE) Economic and Environmental Forum, Prague, 10-12 September 2014;

(h) Eleventh Plenary of the Group on Earth Observation (GEO), Geneva, 13 and 14 November 2014.

B. Knowledge management

45. Knowledge management is at the core of UN-SPIDER activities. By systematically and continuously compiling the knowledge and available resources of individuals and institutions, UN-SPIDER aims to transfer lessons learned, point out innovations and foster collaborative practices. The communities involved in UN-SPIDER activities include many different actors: disaster responders, disaster risk specialists, policymakers, remote sensing experts, space technology providers, academics and researchers. The needs and capabilities of all these actors can vary considerably from region to region and from country to country. In addition to providing technical advice and organizing capacity-building activities and international conferences that bring stakeholders together in person, UN-SPIDER wants to make information and knowledge available more globally.

Knowledge portal

46. The document entitled “Report on the knowledge portal of the United Nations Platform for Space-based Information for Disaster Management and Emergency Response: recent advances” (A/AC.105/1075) contains a summary of efforts made under the UN-SPIDER programme regarding the implementation of the UN-SPIDER knowledge portal. The portal is one of the cornerstones of the UN-SPIDER programme, as it hosts information on all activities conducted by the programme and relevant activities conducted by the disaster risk, the emergency response and space communities. It is increasingly recognized that the portal is making a significant contribution to strengthening existing networks.

47. The portal is structured around the needs of the end user communities. It presents data and information generated by the disaster management and space sectors on one hand, and information from UN-SPIDER, its networks and projects on the other. The portal, today and in the vision of its road map for development, aims to:

(a) Raise awareness of the potential of space-based information for disaster risk reduction and emergency response;

(b) Give access to emergency mechanisms offered by the space community;

(c) Act as a hub for relevant data, software, and training opportunities;

(d) Provide guidelines and instructions on using space applications;

(e) Provide up-to-date information on activities in all stakeholder communities;

(f) Present the context and specific needs of the disaster risk community;

(g) Provide information on relevant institutions and regional support offices;

(h) Provide information on the services that UN-SPIDER offers to countries;

(i) Manage registration for UN-SPIDER events.

48. There was an increase of 85 per cent in the number of visits to the site per month, including a peak due to recent announcements, by visitors coming from countries in Latin America and the Caribbean, compared to the average number of monthly visits six months before and after the roll-out of the Spanish-language version of the knowledge portal in February 2014. A similar effect is expected for the French-speaking countries following the launch of the French-language version, which, at the time of the drafting of the present report, was scheduled for December 2014.

49. Since the launch of the UN-SPIDER knowledge portal in June 2009, a total of 6,300 content items have been published. Almost half of those show the latest developments in science and technology, cover availability of satellite imagery products, and inform about developments, synergies and approaches in the communities concerned. The other half gives an overview of the UN-SPIDER network, for example the regional support offices, available data sources, the geographic information system software tools, case studies, relevant institutions and information about specific disaster events with corresponding lists of available pre- and post-disaster data.

50. UN-SPIDER also uses social media channels to enhance the dissemination of information about and on the knowledge portal. Facebook, Twitter and Google Plus are used to broadcast the latest additions of content on the portal. UN-SPIDER has a total of 10,000 followers on the above-mentioned platforms.

51. The road map followed by the UN-SPIDER team for developing the portal provides for important developments to be undertaken in 2015 and the biennium 2016-2017. To keep up with technological developments, increase the efficiency and reduce maintenance costs, the portal may be migrated to cloud hosting. The team will carefully observe technological trends to improve the portal's services, enhance its use as a training tool, promote it as a platform for virtual forums for use by specific working groups including the regional support offices, and create opportunities for the development of collaborative services.

C. Technical advisory support

52. 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 disaster management and space agencies from other countries and relevant international and regional organizations and institutions; technical advice to national institutions given in 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 to support emergency response.

53. Six missions were scheduled in 2014 by UN-SPIDER 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 covered various issues related to policy, coordination, data access, data availability, data-sharing, capacity-building, and

institutional strengthening. The countries that requested a technical advisory mission were Bhutan, El Salvador, Gabon, Kenya, Mongolia and Zambia.

54. UN-SPIDER had to postpone a mission to Gabon planned for 3-7 November 2014 only a few weeks before it was due to start. The mission was to take place the week before the GEO plenary in Gabon, to which it was to report. However, the plenary was relocated to Geneva by the GEO Secretariat. In addition, because of the Ebola crisis in West Africa, travel restrictions on the experts selected made the activity impossible. The mission was expected to take place in 2015.

1. Technical advisory mission to Kenya, 3-7 March 2014

55. Kenya is exposed to a number of natural hazards, the most common being weather-related, including floods, droughts, landslides, lightning and thunderstorms, wildfires, and strong winds. In the recent past these hazards have increased in number, frequency and complexity.

56. At the request of the Government of Kenya, received through the National Disaster Operations Centre (NDOC) and the National Space Secretariat (NSS), UN-SPIDER carried out a technical advisory mission to Kenya to evaluate the current use of space-based information in all aspects of disaster management, and to strengthen disaster risk management efforts in the country by providing better access to space-based information for disaster risk reduction and response. The mission team met with 19 national bodies and international institutions based in Kenya. The meetings provided an insight into the role each organization played in disaster management and the use made of space-based and geospatial information in the country. In addition the team organized a one-day workshop held on the premises of RCMRD, the UN-SPIDER regional support office, which was attended by over 50 participants from academia, Government ministries, emergency services and international organizations.

57. The workshop included presentations by NDOC, NSS, RCMRD and all experts of the technical advisory mission team. In group discussions participants were encouraged to think about the current and potential use of space technologies in disaster management. The workshop raised awareness about possible applications of space-based technology and the potential for cooperation between different agencies.

58. The mission’s main findings were:

(a) There is a good basis for a national spatial data infrastructure in Kenya;

(b) There are a number of strong early warning systems using geospatial data, especially data about droughts and floods in specific areas;

(c) There is excellent capacity for using up-to-date Earth observation and geographic data at several institutions;

(d) There is a need for capacity-building;

(e) Not all agencies use satellite-based communications and navigation technology.

59. The mission's main observations and recommendations were:

(a) Disaster management and contingency plans can benefit from the incorporation of space-based and geospatial information;

(b) Cooperation and sharing of data and information between institutions could be strengthened;

(c) A national spatial data infrastructure is an important step towards increasing the generation and use of spatial data;

(d) Focal points and the role of institutions in the use of international mechanisms (International Charter on Space and Major Disasters and the Copernicus Emergency Management Service) for acquiring Earth observation data and products should be clarified in order to access these resources;

(e) Adequate management of data and metadata within the relevant institutions should be ensured;

(f) Institutions that need to strengthen their capacities could take advantage of the knowledge available at local universities and public institutions;

(g) Training courses should be conducted to strengthen the skills of staff in geographic information system units, including courses on remote sensing applications for disaster-risk assessment and emergency response.

2. Technical advisory mission to El Salvador, 2-4 April 2014

60. The technical advisory mission to El Salvador was conducted at the request of the Secretariat for Vulnerability Issues of the Office of the President of the Republic and the Directorate-General for Civil Protection. The mission included meetings with representatives of the Ministry of the Environment and Natural Resources, the Ministry of Agriculture and Livestock, the Ministry of Public Works, Transport, Housing and Urban Development, the Ministry of Foreign Affairs, the Ministry of Public Health and other government agencies, regional and international organizations and the University of El Salvador. The mission also included a review of existing legislation and policies targeting disaster risk management, emergency response, and sustainable development. The mission further reviewed institutional web pages and other documents of those and other relevant institutions.

61. The mission analysed five aspects that are relevant to the generation and use of information derived from satellite applications in all phases of the disaster management cycle: satellite imagery processing and visualization of geospatial information; applications of geospatial information; access to and exchange of data, information and satellite images among government agencies; inter-institutional networks; and capacity-building and institutional strengthening.

62. The most important recommendation of the technical advisory mission was that the National System of Civil Protection, Disaster Prevention and Mitigation and the Directorate-General for Civil Protection implement a policy focusing on the generation and use of geospatial information for decision-making with regard to integrated disaster risk management, response and recovery.

63. The mission suggested the following strategies to implement this policy:

(a) The establishment of an integrated geospatial information system;

(b) The promotion of an inter-institutional approach to leverage existing capabilities in various Government ministries and institutions, and in universities and private sector institutions;

(c) The generation of pertinent information by using data, images and products that the space community makes available free of charge.

3. Technical advisory mission to Zambia, 26-30 May 2014

64. The mission was invited by the Disaster Management and Mitigation Unit of the Office of the Vice-President. It took stock of issues such as policy gaps, availability of satellite data and geospatial information for all relevant institutions, the current use of space-based information in the country, and existing data-sharing practices. A one-day workshop introduced participants to the potential of space-based technologies for disaster management and to best practices, and looked at options to improve their usage in Zambia. Zambia is in many ways advanced in its use of technology and its ability to use geospatial data. Its main needs are to set up a national spatial data infrastructure, to expand data-sharing, and to obtain access to regular Earth observations and high-resolution data from public and commercial sources.

65. The mission recommended:

(a) To collect additional remote sensing data and analysis for early warning;

(b) To collect weather information in real time and to set up a denser network of weather stations to provide more accurate and timely information about the local situation;

(c) To compile climate change resiliency information and related plans;

(d) To set up flood plain and risk mapping and an early warning system for floods;

(e) To develop flash flood modelling and prediction capabilities;

(f) To build capacity for remote sensing and the geographic information system and raise awareness, making optimal use of low-cost approaches and free data sources, applications, technologies and services;

(g) To set up a fire warning system, recruit more fire watch staff and acquire more fire watch facilities and modelling tools;

(h) To collect specific upper atmospheric data and models;

(i) To develop a national high resolution digital elevation model;

(j) To promote access to radar imagery and develop related processing capability.

4. Technical advisory mission to Bhutan, 2-6 June 2014

66. At the request of the Government of Bhutan, received through the Department of Disaster Management of the Ministry of Home and Cultural Affairs, UN-SPIDER carried out a technical advisory mission to evaluate the current use of space-based information and its potential for future use in all aspects of disaster management,

and to strengthen the disaster risk management efforts in the country by providing better access to space-based information for disaster risk reduction and response.

67. The team visited key stakeholder agencies of the Department of Disaster Management to take stock of issues such as current policy and gaps, availability of geospatial information, the current use of space-based information, data-sharing practices, applications of geospatial information, challenges and constraints, existing capacity and needs, institutional linkages and coordination, and applications aimed at strengthening disaster risk reduction and emergency response. The team visited the Ministry of Home and Cultural Affairs, the Ministry of Works and Human Settlements, the Ministry of Economic Affairs and the Ministry of Agriculture and Forests.

68. The mission also included a one-day workshop held on 5 June 2014 and organized jointly with UNDP and the Department of Disaster Management.

69. One of the main outcomes of the technical advisory mission was a project proposal that the UNDP Bhutan country office had developed in close collaboration with the Department of Disaster Management of the Ministry of Home and Cultural Affairs and UN-SPIDER entitled "Disaster response and recovery preparedness (2014-2016)". This joint effort is to receive $200,000 (12,104,000 ngultrum) from the Bureau for Crisis Prevention and Recovery of UNDP.

5. Technical advisory mission to Mongolia, 11-15 August 2014

70. At the request of the Government of Mongolia, received through the National Emergency Management Agency, UN-SPIDER carried out a technical advisory mission and visited key stakeholder organizations, including the following: National Emergency Management Agency, Information and Early Warning Centre of Ulaanbaatar, Astronomy and Geophysics Research Centre, National Remote Sensing Centre, National Agency for Meteorology and Environmental Monitoring, Mongolia National Data Centre, Information Technology, Post and Telecommunications Authority, Emergency Management Department and other stakeholders in Orkhon and Khentii provinces, and several related agencies.

71. A half-day workshop was organized jointly with the National Emergency Management Agency as part of the mission. It was attended by around 40 participants from academia, government ministries, emergency services and international organizations. The workshop included presentations given by the Agency, the National Remote Sensing Centre, and members of the technical advisory mission team. In group discussions participants were encouraged to think about how priority could be given to using space technologies for disaster management.

D. Follow-up activities to technical advisory missions

72. Most countries that had received a technical advisory mission requested additional support from UN-SPIDER in implementing the recommendations. The requests concerned capacity-building, institutional strengthening and developing partnerships to build the required data infrastructure and the analytical tools for the development of basic information for disaster risk reduction and emergency

response. The programme organized or collaborated in the organization of regional events and was able to mobilize resources to sponsor the participation of experts from countries where the programme had previously executed technical advisory missions in training events in their region. Those training events are detailed below.

1. International training course on flood forecast and hazard mapping, Kathmandu, 9-13 June 2014

73. The purpose of the training course, which was held jointly with the regional support office, the International Centre for Integrated Mountain Development (ICIMOD), was to improve disaster risk management through the use of space-based and geospatial information by providing hands-on training to officials of participating countries.

74. Part of the support for the training course came from the Regional Visualization and Monitoring System (SERVIR-Himalaya), which is funded by the United States Agency for International Development (USAID) through the National Aeronautics and Space Administration (NASA). The training course covered methods for and approaches to landslide hazard mapping. Participants were exposed to concepts and practical exercises.

75. Twenty participants from disaster management agencies and stakeholder departments of ICIMOD member States participated. The training course included hands-on sessions on flood inundation, flood mapping and monitoring and landslide hazard mapping. UN-SPIDER delivered lectures on climate change, disaster risk reduction and space technology, and the role of space technology in the Hyogo Framework of Action 2005-2015: Building the Resilience of Nations and Communities to Disasters, and the post-2015 framework for disaster reduction.

2. Course in space-based applications for use in disaster risk reduction, Beijing, 18-23 September 2014

76. The course immediately followed the United Nations International Conference on Space-based Technologies for Disaster Management: Multi-hazard Disaster Risk Assessment held in Beijing and was organized jointly with the National Disaster Reduction Centre of China (NDRCC). A total of 22 participants from 17 countries from Asia and the Pacific and from Africa attended the training programme.

77. The training course was taught by experts from UN-SPIDER, NDRCC, and Beijing Normal University and included theoretical lectures and hands-on exercises on the following topics:

(a) Concepts in the remote sensing of drought;

(b) An introduction to spatial data access and spatial data software;

(c) Principles and methods for extracting data on vegetation affected by drought;

(d) Principles and methods for extracting data on water bodies affected by drought;

(e) Drought monitoring based on multi-data sources;

(f) Theory and application of the integrated surface drought index (ISDI);

(g) Principles and methods relating to the use of space technology in drought risk assessment;

(h) Rapid mapping for drought monitoring and risk assessment.

3. Workshop and simulation exercise, Hanoi, 10-15 November 2014

78. As a follow-up to the technical advisory mission conducted by UN-SPIDER in Viet Nam in March 2013, UN-SPIDER provided technical advisory support in the form of a workshop and simulation exercise held jointly with the Geospatial Information and Technology Association (GITA). The topic of the event was the programme Geospatially Enabling Community Collaboration (GECCo). The purpose of the workshop was to enable government authorities to use space-based and geospatial information at the local and regional levels during a crisis, and to foster personal relationships and the exchange of knowledge required at the local and regional levels for successful collaboration during a disaster.

79. The event was sponsored jointly by GITA and other partner organizations, including the Pacific Disaster Centre, UNDP Viet Nam, the Office for the Coordination of Humanitarian Affairs, and DigitalGlobe. About 120 officials participated, including 18 provincial disaster management officials.

4. Technical advisory support (training) on Earth observation technologies for flood risk mapping, modelling and management, Colombo, 17-21 November 2014

80. As a follow-up to the technical advisory mission to Sri Lanka, a first training course had already been held on the topic “Space technology for improving hazard mapping in Sri Lanka” in August 2012. It was followed by a training event, which was held from 17 to 21 November 2014.

81. The event consisted of a workshop and training programme. It was jointly conducted by UN-SPIDER and the International Water Management Institute (IWMI) under the auspices of the Disaster Management Centre of the Ministry of Disaster Management of Sri Lanka.

82. The event included a one-day workshop for decision makers, followed by a four-day training programme. The objective was to enable disaster management stakeholders to learn how to access and disseminate flood-related information easily, quickly and accurately.

83. One of the outcomes of the engagement of UN-SPIDER with Sri Lanka is that the Disaster Management Centre of Sri Lanka now plays a prominent role in the implementation of the national spatial data infrastructure.

E. Support in emergencies

84. In 2014, the Office for Outer Space Affairs, through UN-SPIDER, requested the activation of the International Charter Space and Major Disasters once. At the end of July 2014, a segment of a mountainous area in La Vega province in the Dominican Republic was affected by a major forest fire. The National Emergency Operations Centre of the National Emergency Commission, the top-level coordination mechanism established by law in 2002, contacted UN-SPIDER to

request support in the activation of the Charter. With the support of the National Commission for Space Activities of Argentina (CONAE) and the United States Geological Survey (USGS), the Charter was activated on 30 July 2014. The Centre for Satellite-based Crisis Information (ZKI) of the German Aerospace Centre (DLR) was appointed project manager. The UN-SPIDER Bonn office facilitated interactions between ZKI and the National Emergency Operations Centre and facilitated the translation of specific texts in the maps produced by ZKI into Spanish to enhance their use in the Dominican Republic. As a follow-up to this initiative, efforts are under way to ensure that the Centre can become an authorized user under the new framework established by the universal access initiative of the Charter.

85. The cooperation between the Charter on Space and Major Disasters and the Office for Outer Space Affairs was highlighted and detailed in statements and presentations at a number of international events and conferences during the reporting period. Every opportunity was used by staff to raise awareness of the opportunities offered by the Charter, particularly the universal access initiative, in accordance with the original cooperating body agreement.

86. UN-SPIDER regularly receives requests for support from Member States in obtaining Earth observation data and products to reduce the risks associated with natural disasters, or in connection with threats not normally supported under the Charter. Within its mandate 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, UN-SPIDER sought opportunities to support those governments.

87. According to media reports, a landslide in the village of Abe Barik in Afghanistan in Badakhan province killed over 2,000 villagers in May 2014. UN-SPIDER contacted the Afghanistan National Disaster Management Authority (ANDMA) and the United Nations Office on Drugs and Crime (UNODC) office in Kabul to receive exact coordinates and established a direct line of communications between ANDMA and the Operational Satellite Applications Programme (UNOSAT) of the United Nations Institute for Training and Research (UNITAR), so as to ensure that ANDMA received all relevant information about Charter products (the Charter had already been activated in response to flooding in the region).

88. The Charter was activated following a tsunami in Chile on 2 April 2014. UN-SPIDER contributed by requesting image support from China, which was provided by NDRCC and CNSA, and consisted of several images from the HJ-1 and GF-1 satellites, together with a reference map.

89. ICIMOD activated Sentinel Asia in response to a landslide in Nepal that happened on 2 August 2014. ICIMOD requested support from UN-SPIDER to acquire high-resolution images. UN-SPIDER proactively informed DigitalGlobe and the Indian Space Research Organization (ISRO) about activating Sentinel Asia. DigitalGlobe provided WorldView images, whereas ISRO shared images from its RESOURCESAT radar imaging satellite. The alert level was subsequently raised and the Charter was activated on 5 August 2014.

90. Two UN-SPIDER experts participated in the training of project managers for the Charter on 10 and 11 April in Beijing. Providing project manager training is one of the most important steps taken to improve the effective operation of the Charter mechanism. The aim of the training is to provide a deeper understanding of the

process of coordinating Charter activations and use the Charter mechanism effectively during emergencies.

F. Activities carried out by the regional support offices

91. Updated information on each regional support office, together with contact details for relevant entities, can be found on the UN-SPIDER knowledge portal. Detailed information about their valuable contributions in the delivery of the UN-SPIDER mandate are included in the "Report on joint activities carried out in 2014 by the regional support offices of the United Nations Platform for Space-based Information for Disaster Management and Emergency Response" (A/AC.105/1079).

92. The regional support offices meet every year at the sessions of the Scientific and Technical Subcommittee of the Committee on the Peaceful Uses of Outer Space. On these occasions they review the work carried out during the previous year and plan future activities in support of the programme. The meeting of February 2014 included stakeholder consultations on the role of the regional support offices and a review of ongoing joint technical advisory and outreach activities. The meeting also addressed the topic of support for the implementation of the UN-SPIDER knowledge portal road map, the progress made in preparing the booklets on recommended practices in the use of space technologies for the various disaster management efforts, and the use of geovisualization tools in their work. The regional support offices and the UN-SPIDER team also considered the workplan for the biennium 2014-2015 and identified a set of activities to support it.

93. One of the main actions supported by regional support offices is the joint publication of booklets on recommended practices. The booklets are based on the experience gathered in the country of each regional support office. Regional support offices also made significant contributions towards intensifying joint efforts to raise additional resources for the programme. A number of regional support offices were particularly active during 2014 in such joint activities. For example, in Iran (Islamic Republic of), ISA made significant efforts in preparing the booklet on recommended practices. The booklet presents space tools for national drought monitoring and drought assessment and also looks at how e-learning can be used for awareness-raising in the context of the programme. In Ukraine, NASU-SSAU continued the preparation of two booklets with recommended practices for crop yield prediction and synthetic aperture radar-based flood mapping, and, together with other regional support offices, contributed to the development of a joint project proposal for the Horizon 2020 framework programme of the European Union about innovative methods for flood risk assessment based on Earth observation data. In Nepal ICIMOD actively supported technical advisory missions with related follow-up work in the region. ICIMOD also supported the Beijing UN-SPIDER conference and other outreach efforts, such as joint participation in the upcoming Third World Conference on Disaster Risk Reduction.

94. A number of regional support offices continued to support emergency response-related activities and were encouraged to receive training as Charter project managers to further strengthen the network and its ability to deliver the UN-SPIDER mandate.

IV. Voluntary contributions

95. In its resolution A/69/85, the General Assembly encouraged Member States, on a voluntary basis, to provide the programme with the additional resources necessary to address the increasing demand for support successfully and in a timely manner.

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

(a) The Government of Austria, which contributed 150,000 euros in 2013 through the Austrian Research Promotion Agency and extended the funding period to 2014;

(b) The Federal Ministry for European and International Affairs of Austria, which funded the services of an associate expert up to March 2014;

(c) The Government of Germany, which contributed 150,000 euros towards the activities of the UN-SPIDER office in Bonn and the services of two associate experts in 2014;

(d) The Government of China, which contributes 1,250,000 yuan a year towards the activities of the UN-SPIDER office in Beijing and provides the services of two experts from NDRCC and CNSA as non-reimbursable loans;

(e) DLR, which provided the services of one expert as a non-reimbursable loan as of September 2014;

(f) SWF, which contributed to two events organized by UN-SPIDER: an expert meeting and technical advisory mission in El Salvador and an expert meeting in Bonn, Germany;

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

(h) DigitalGlobe, GITA, ESRI and UNDP Viet Nam, which contributed to the GECCo workshop held as part of the follow-up programme to the technical advisory mission to Viet Nam;

(i) LAPAN, ASEAN AHA Centre and ESCAP, which contributed to the ASEAN workshop;

(j) ICIMOD, which contributed to the training course in Kathmandu;

(k) IWMI, which contributed to the training event in Colombo;

(l) NDRCC, which contributed to the training course in Beijing.

97. The in-kind and, in some cases, financial contributions of those organizations are recognized as central to the success of the programme in 2014. At the same time they 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.