General Assembly

**Committee on the Peaceful
Uses of Outer Space**

Report on the activities carried out in 2010 in the framework of the United Nations Platform for Space-based Information for Disaster Management and Emergency Response

Summary

　　In its resolution 61/110, the General Assembly decided to establish 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 risk management to support the full disaster management cycle. In its resolution 62/217, the Assembly agreed that the acronym of the United Nations Platform for Space-based Information for Disaster Management and Emergency Response should be UN-SPIDER.

　　The present report contains a summary of the implementation of activities carried out in 2010 in the framework of UN-SPIDER with regard to the workplan for the biennium 2010-2011 (A/AC.105/937, annex).

　　Major accomplishments achieved in 2010 include the provision of technical advisory support to 17 Member States, the formalization of cooperation agreements for the establishment of five additional regional support offices, the provision of support for responding to 29 disasters, including the earthquake that hit Haiti in January, the improvement of the UN-SPIDER knowledge portal and the organization of and provision of support to international and regional workshops and expert meetings.

Contents

I. Introduction

1. In its resolution 61/110, the General Assembly decided to establish 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 risk management to support the full disaster management cycle and agreed that the programme should be implemented by the Office for Outer Space Affairs of the Secretariat. In its resolution 62/217, the Assembly agreed that the acronym of the United Nations Platform for Space-based Information for Disaster Management and Emergency Response should be UN-SPIDER.

2. In its resolution 64/251, on international cooperation on humanitarian assistance in the field of natural disasters, from relief to development, the General Assembly encouraged the further use of space-based and ground-based remote-sensing technologies, including as provided by UN-SPIDER. In its resolution 65/97, the Assembly noted with satisfaction the progress made within the framework of UN-SPIDER in the implementation of the platform's workplan for the period 2010-2011 (A/AC.105/937, annex).

3. 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. The present report contains a summary of the implementation of activities carried out in 2010 in the framework of UN-SPIDER with regard to the workplan for the biennium 2010-2011.

4. Major accomplishments achieved in 2010 include the provision of technical advisory support to 17 Member States, the formalization of cooperation agreements for the establishment of five additional regional support offices, the provision of support for responding to 29 disasters, including the earthquake that hit Haiti in January, the improvement of the UN-SPIDER knowledge portal and the organization of and provision of support to international and regional workshops and expert meetings.

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.

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

6. The Director of the Office for Outer Space Affairs supervises the UN-SPIDER programme and is responsible for its overall implementation. The Director is assisted by a programme coordinator, who is responsible for planning, coordinating

and implementing all UN-SPIDER activities with the support of a programme officer leading the activities of the UN-SPIDER office in Bonn, Germany, a programme officer leading the activities of the UN-SPIDER office in Beijing and a programme officer leading outreach and capacity-building activities.

7. On 17 June 2010, a host country agreement was signed between the Government of China and the Office for Outer Space Affairs for the establishment of the UN-SPIDER office in Beijing. On 10 November 2010, that office was formally inaugurated; it is expected to become fully operational in the first part of 2011.

8. By the end of 2010, the following 13 staff members, senior experts and consultants were working in the framework of UN-SPIDER, distributed as follows:

(a) In Vienna: the programme coordinator, a programme officer responsible for outreach and capacity-building activities, a programme officer responsible for coordinating technical advisory support to Member States (who will be transferred to the UN-SPIDER office in Beijing in January 2011 to lead the activities of the recently inaugurated office), 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 of the programme;

(b) In Bonn: a programme officer who leads the activities of the UN-SPIDER office in Bonn, two senior experts (provided by the German Aerospace Center (DLR) as non-reimbursable loans) to support the implementation of the knowledge portal and other activities, an associate expert (provided by the Government of Germany) to support the development and implementation of the knowledge portal and an associate expert (also provided by the Government of Germany) to support the compilation and dissemination of information and the maintenance of the knowledge portal's content. In addition, two senior experts (provided by Turksat as non-reimbursable loans) are supporting programme activities with regard to satellite communications, technical advisory support to Member States and outreach activities, and a consultant was contracted, on a part-time basis, to provide programming and technical support to the development of the knowledge portal.

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 UN-SPIDER in their respective regions in a coordinated manner.

10. In 2010, the Office for Outer Space Affairs signed cooperation agreements for the establishment of regional support offices with five organizations, bringing the total number of established regional support offices to 10. In addition, Colombia, Indonesia, the Philippines and South Africa have offered to host regional support offices and it is expected that cooperation agreements will be signed with each of those countries in 2011.

11. UN-SPIDER regional support offices are being hosted by six national organizations (the Algerian Space Agency, the Iranian Space Agency, the National Space Research and Development Agency of Nigeria, the Pakistan Space and Upper-Atmosphere Research Commission, the Romanian Space Agency and the National Space Agency of Ukraine) and four regional organizations (the Asian Disaster Reduction Center, based in Kobe, Japan; the Regional Center for Mapping of Resources for Development, based in Nairobi; the University of the West Indies at St. Augustine, Trinidad and Tobago; and the Water Center for the Humid Tropics of Latin America and the Caribbean (CATHALAC), based in Panama City).

C. National focal points

12. A national focal point is a national institution nominated by the Government of the respective country, representing the disaster management and space application communities. The role of national focal points is to work with UN-SPIDER staff to strengthen national disaster management planning and policies and implement specific national activities that incorporate space-based technology solutions in support of disaster management. National focal points are the main institutions with which UN-SPIDER staff work at the national level with the aim of promoting access to and the use of space-based solutions for disaster management in the country.

13. In calling for the nomination of national focal points, the Office for Outer Space Affairs specifically requested Governments to consider the possibility of nominating the same focal point that had been appointed for the implementation of the Hyogo Framework of Action 2005-2015: Building the Resilience of Nations and Communities to Disasters. By the end of 2010, 41 Member States had nominated a national focal point.

III Activities carried out in 2010

14. The work carried out in the framework of UN-SPIDER in 2010 followed the workplan for the biennium 2010-2011 (A/AC.105/937, annex) and UN-SPIDER staff worked closely with the regional support offices, building upon the offices' resources and expertise.

A. Outreach and capacity-building activities

15. The targets to be carried out in 2010 in the framework of UN-SPIDER were met: 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 and support to several capacity-building activities.

16. Major outreach activities conducted by UN-SPIDER included the organization of international and regional workshops and expert meetings. A summary of the activities carried out in 2010 is contained below. Further information, including a detailed report of each workshop, is available on the UN-SPIDER knowledge portal (www.un-spider.org).

UN-SPIDER regional workshop entitled "Building upon Regional Space-based Solutions for Disaster Management and Emergency Response for Africa"

17.   UN-SPIDER successfully conducted its regional workshop for the African continent in Addis Ababa from 6 to 9 July, in cooperation with the Economic Commission for Africa. More than 80 senior experts and decision makers from 27 countries and international organizations participated in this four-day event, which benefitted considerably from the support provided by the Government of Austria and the Secure World Foundation. The workshop was officially opened by Josué Dioné, the Acting Head of the Commission and Director of the Commission's Food Security and Sustainable Development Division.

18.   At the workshop UN-SPIDER staff obtained information to define a plan of action for tailoring the platform's activities in Africa, identified strategies to bridge the gap between the space and the disaster management communities and improved communication and coordination among existing initiatives in African countries with regard to access to and use of space-based technologies for disaster risk management, emergency response, climate change and health-related issues. The opportunity was also used to present and discuss various aspects of the UN-SPIDER programme.

19.   Plenary presentations, panels and discussion sessions were conducted with representatives of Government agencies and regional and international organizations. Participants provided valuable recommendations on each of the eight workshop topics: climate change; telehealth; space-based information for disaster management and emergency response; networking and long-term sustainability; opportunities to support emergency response activities in Africa; capacity-building efforts in the region; ways to institutionalize space-based information for disaster risk reduction and emergency response; and information management, including spatial data infrastructure, using space-based information for emergency response and disaster risk reduction. The recommendations can be viewed on the UN-SPIDER knowledge portal.

20.   The workshop managed to actively involve African experts and to support African countries to access and use space-based applications and solutions targeting all the topics addressed at the workshop. Several follow-up activities were initiated during the workshop, including the establishment of a committee to organize a technical workshop for West and Central Africa, to be held in 2011, and several technical advisory missions to African countries. Another outcome of the workshop was the planning, by UN-SPIDER in cooperation with civil protection agencies, of a survey on the use of space-based information in case of disasters. The workshop also provided the opportunity for the signature of an agreement with the Regional Center for Mapping of Resources for Development for the establishment of a UN-SPIDER regional support office in Nairobi.

Fourth international UN-SPIDER workshop on disaster management and space technology, on the challenges of communication, coordination, cooperation and capacity-development

21.   UN-SPIDER successfully held the fourth international workshop on disaster management and space technology in Bonn from 12 to 14 October 2010. A total of 119 participants from 40 countries and representatives from several United Nations

entities, national space agencies, national disaster management organizations, universities and private companies attended the workshop, which had been organized in cooperation with DLR, with support from Turksat.

22.   Four main topics were covered by the workshop participants. The session on international support mechanisms and the SpaceAid framework aimed at strengthening international coordination among mechanisms that provide space-based information to support emergency response, such as the Charter on Cooperation to Achieve the Coordinated Use of Space Facilities in the Event of Natural or Technological Disasters (also called the International Charter on Space and Major Disasters), the Services and Applications for Emergency Response (SAFER) project of the Global Monitoring for Environment and Security (GMES) initiative, Sentinel Asia, the Mesoamerican Regional Visualization and Monitoring System (SERVIR) and the UN-SPIDER SpaceAid framework. During the session on satellite communication for disaster management, service providers, technology developers and users discussed satellite communication services for emergency telecommunications. The third session focused on Earth observation and geospatial information in support of risk and disaster management; a presentation was given on the UN-SPIDER knowledge portal and initiatives, case studies, best practices and capacity-building opportunities were discussed. Focusing on the UN-SPIDER network, the fourth session included presentations from UN-SPIDER regional support offices and partner institutions highlighting the contribution of the established global network to the mandate of UN-SPIDER.

23.   The major recommendations arising from the four sessions included a strong plea for improved coordination and communication among those involved in emergency response activities and in prevention and preparedness phases. In particular, issues related to telecommunications and data transfer were raised. It was suggested that an international working group on that matter be created within the framework of UN-SPIDER. Other recommendations included the development of appropriate methods for purchasing satellite capacity, the need for coordination in capacity-building, the requirement of user-friendliness, complementing space-based information with crowdsourcing solutions, the need to recognize the importance of preparedness and the need to ensure the availability of and access to coordinated meta-information.

Special session of the SPIDER Thematic Partnership for Latin America and the Caribbean on space-based applications for managing risk reduction and emergency response in Latin America and the Caribbean

24.   At the Second Hemispheric Encounter on National Mechanisms and Networks for Risk Reduction, held in Santa Marta, Colombia, from 14 to 16 April 2010, UN-SPIDER held a special session, on 14 April, to promote the SPIDER Thematic Partnership for Latin America and the Caribbean. The session allowed UN-SPIDER staff to reach out to both the space community, represented by the Colombian Space Commission and the National Commission on Space Activities of Argentina, and the disaster risk management community.

25.   The session was attended by 34 participants from a variety of agencies working at the national, regional and international levels, including those responsible for civil defence and risk management in Colombia and the Colombian Armed Forces; the Association of Caribbean States; the Office for the Coordination

of Humanitarian Affairs of the Secretariat; the International Strategy for Disaster Reduction (ISDR); the Economic Commission for Latin America and the Caribbean; the Organization of American States; the International Federation of the Red Cross and Red Crescent Societies; the civil protection agencies from a number of countries; the University of the West Indies and Florida International University; Thermopylae Sciences and Technology; and the Inter-American Defense Board.

26.   The session provided an opportunity for representatives of space agencies of South American countries to present examples of disaster risk management and emergency response activities; for experts from Thermopylae Sciences and Technology to present the 3D-UDOP geo-viewer, an example of state-of-the-art technology focusing on the display of information to improve situational awareness and to support decision-making in disasters; for UN-SPIDER staff to present the programme and the SPIDER Thematic Partnership for Latin America and the Caribbean and to discuss elements for elaborating a plan of action for the Thematic Partnership for Latin America and the Caribbean with a focus on disaster risk management to support national platforms for disaster risk reduction. For example, it was suggested that a workshop be held to identify ways of tailoring space-based information so that it can be utilized more efficiently and quickly by disaster management agencies involved in the assessment of risks and in the context of early warning.

Pre-symposium workshop on space-based information for disaster preparedness and risk management

27.   On 2 and 3 October 2010, 53 stakeholders from States members of the International Centre for Integrated Mountain Development (ICIMOD) and international experts attended a pre-symposium workshop on space-based information for disaster preparedness and risk management. The event was organized by ICIMOD with the support of the United States Agency for International Development and the National Aeronautics and Space Administration of the United States. International partners included UN-SPIDER, the Japan Aerospace Exploration Agency (JAXA) and the Asian Disaster Preparedness Centre.

28.   The workshop preceded an international symposium on benefiting from Earth observation and was intended to appraise ICIMOD member States on ways in which they could access and use space-based information for disaster preparedness and risk management. During the event, ICIMOD celebrated the installation on its premises of a new JAXA receiving station, which would facilitate access to satellite images in cases of major disasters in the Hindu Kush-Himalayan region.

29.   UN-SPIDER staff presented a paper entitled "Spatial data to complement the use of space-based information for disaster management" and identified opportunities for collaborating with the disaster management agencies of the ICIMOD member States and other important partners in the Hindu Kush-Himalayan region participating in the event.

Expert meeting on incorporating space-based information and technology into disaster risk reduction and climate change adaptation

30.   UN-SPIDER and the Asian Disaster Reduction Centre jointly organized the expert meeting on incorporating space-based information and technology into disaster risk reduction and climate change adaptation, which was held in Incheon, Republic of Korea, on 26 October 2010, during the Fourth Asian Ministerial Conference on Disaster Risk Reduction. The meeting brought together more than 20 experts from the region.

31.   At the expert meeting, four panellists gave presentations on various aspects related to the theme of the event and the organizers were able to highlight the role of space technology in the overall context of disaster risk reduction and climate change. The presence of major stakeholders was instrumental in preparing a statement about the use of space technology and in including that statement in the official documents emerging from the Ministerial Conference.

32.   Meeting participants confirmed the necessity of utilizing space technology for effective disaster risk reduction. They also agreed that UN-SPIDER and Sentinel Asia were useful initiatives for all developing countries and highlighted that capacity-development in analyzing satellite data and rapid monitoring of affected areas were expected to directly benefit disaster management organizations.

Other outreach activities

33.   In the framework of UN-SPIDER, carrying out outreach activities includes facilitating and taking part in activities that involve new audiences, consolidate new partnerships and/or promote new technological solutions, thereby offering new opportunities for raising the awareness of existing and new target groups.

34.   Specific publications, displays and educational material were produced and disseminated widely. Among the outreach material produced were leaflets (in English, French and Spanish), regular e-newsletters and monthly updates, as well as other promotional material that was distributed at workshops and conferences and was made available via the knowledge portal and by e-mail, through a mailing list, to over 15,000 professionals.

35.   Articles about certain aspects of the work of UN-SPIDER were published on a number of websites and in various national and international publications. Furthermore, the UN-SPIDER response to the earthquake that hit Haiti in January 2010 was shown in an educational programme broadcast by a German television network. In 2010, the Facebook and Twitter profiles of UN-SPIDER were used to disseminate programme-related and community news.

36.   During the forty-seventh session of the Scientific and Technical Subcommittee of the Committee on the Peaceful Uses of Outer Space, UN-SPIDER staff organized a meeting of established and prospective regional support offices in order to consolidate the activities carried out by those offices and to facilitate the exchange of information among the offices. Representatives of eight regional support offices took part in the meeting.

37.   UN-SPIDER staff participated in the main regional disaster risk reduction platform meetings organized within the framework of ISDR. Those meetings, which took place in Africa, Asia and the Pacific, Europe and Latin America and the

Caribbean, were used to generate awareness among disaster risk reduction communities about the SPIDER Global Thematic Partnership, which had been launched in 2009 by UN-SPIDER to foster the use of space-based information for disaster management.

38. On 13 October 2010, the Office for Outer Space Affairs observed the International Day for Disaster Reduction, designated by the General Assembly in its resolution 44/236, by showing relevant videos at the UN-SPIDER office in Bonn. Also on 13 October, a video message by Margareta Wahlström, Assistant-Secretary-General for Disaster Risk Reduction, was shown in the plenary session of the fourth international UN-SPIDER workshop on disaster management and space technology, held in Bonn from 12 to 14 October 2010.

39. UN-SPIDER staff set up stands and informed the general public and participants in certain events about the work of the programme, both on 23 October 2010, in observance of United Nations Day, in the centre of Bonn, and during the Eighth Conference of the African Association for Remote Sensing of the Environment, held in Addis Ababa from 25 to 29 October 2010.

40. UN-SPIDER experts participated in a number of relevant meetings to provide information about space-based solutions for disaster management and emergency response and the work done through UN-SPIDER. A full list of activities and detailed reports on those events can be downloaded from the UN-SPIDER knowledge portal.

41. UN-SPIDER staff provided funds to help participants from developing countries pay for their travel to international meetings. In that context, an expert from Nigeria received support to attend the Eighth Conference of the African Association for Remote Sensing of the Environment.

Support to capacity-building

42. It is important to build capacity and strengthen institutions at all levels in order to increase the ability of organizations and individuals to effectively use space-based technologies for disaster reduction, preparedness, response and recovery. Capacity-building efforts, as defined in the capacity-building strategy of UN-SPIDER (A/AC.105/947), are being carried out by institutionalizing the use of space-based and disaster-related information in agencies and organizations responsible for carrying out such tasks; facilitating the training of individuals; and supporting access to hardware, software and related infrastructure to make use of such information.

43. During 2010, several capacity-building activities were carried out in line with the workplan for the biennium 2010-2011, including the following:

(a) Technical advisory missions were conducted in the context of institutionalizing the use of space-based information. The missions allowed UN-SPIDER to become aware of policies and strategies being implemented by Government agencies with respect to the institutionalization of the use of space-based information supporting all phases of the disaster management cycle and to provide policy-relevant advice on that issue to authorities in those Governments' countries;

(b)   UN-SPIDER staff participated in the Sixth Space Conference of the Americas, held in Pachuca, Mexico, in November 2010, where they stressed the need to institutionalize the use of space-based information;

(c)   A curriculum on the use of space-based information for emergency response was elaborated and will be circulated in January 2011 among the members of an expert working group on capacity-building for feedback. The curriculum includes modules on basic elements of Earth observation and focuses on how observing Earth can provide information for emergency activities in response to floods, earthquakes, landslides, tsunamis, volcanic eruptions and drought;

(d)   A training event entitled "Geoinformation systems and disaster management: from concepts to applications" was held by the National Institute of Disaster Management of India, with support from UN-SPIDER, in New Delhi from 11 to 13 January 2010. Representatives of state governments participated in the event, which aimed to assess the use of space technology for disaster management. Representatives from 13 states and UN-SPIDER staff supported the participation of people from Bangladesh and Nepal. Recommendations were made with regard to possibly making policy interventions in the areas of capacity-building, access to space-based and geo-information, and effective data sharing;

(e)   A training course entitled "Rapid mapping and communication support within disaster management" was held by DLR, in cooperation with the Centre for Geoinformatics of the University of Salzburg, in Oberpfaffenhofen, Germany, from 22 to 24 March 2010. UN-SPIDER provided travel support for two participants from Jamaica and Togo to attend the course;

(f)   UN-SPIDER supported the fifth summer school of the Student Consortium of the International Society for Photogrammetry and Remote Sensing, held in Hanoi from 6 to 10 November 2010, by providing travel support to one lecturer from Ukraine, who also participated in the 31st Asian Conference on Remote Sensing, held in Hanoi from 1 to 5 November 2010;

(g)   Support was given to the Regional Centre for Space Science and Technology Education for Latin America and the Caribbean, affiliated to the United Nations, and to the National Commission on Space Activities of Argentina in the conduct of the second spring school, on natural disasters and spatial solutions for disaster management: drought and desertification, held in Rosario, Argentina, in April 2010;

(h)   Discussion sessions were organized during the UN-SPIDER regional workshop entitled "Building upon Regional Space-based Solutions for Disaster Management and Emergency Response for Africa", held in Addis Ababa from 6 to 9 July 2010, to allow UN-SPIDER staff to gather feedback from experts that could be used to revise the programme's capacity-building strategy. In addition, the workshop allowed UN-SPIDER staff and participants from selected Member States to plan a training workshop for West and Central Africa in 2011;

(i)   In the context of e-learning, UN-SPIDER staff participated in a workshop organized by the Centre for Geoinformatics of the University of Salzburg, where senior experts from the Centre presented the results of a project entitled "e_SPIDER", which was carried out with financial support from the Government of Austria and is directly linked to the e-learning environment of UN-SPIDER. The

results of the project are being included in the database on training opportunities and the UN-SPIDER e-learning environment design;

(j) UN-SPIDER staff held meetings with academic officers from the United Nations University Institute for Environment and Human Security and with researchers from the University of Alcala in Spain and Colombia, Greece and Mexico to design the e-learning environment of UN-SPIDER. Initial work has focused on the design of an ontology (here understood as "a formal representation of knowledge as a set of concepts within a domain, and the relationships between those concepts") for facilitating the assembly of didactical content within the knowledge portal and the discovery of such content by centres of excellence, training centres, universities and trainees. Preliminary work regarding the design of the ontology has been published in scientific journals and has been presented in various international workshops;

(k) A database of training opportunities was developed and made publicly available on the UN-SPIDER portal. The database contains more than 50 entries on training opportunities and is divided into three segments: web-based or e-learning courses; standard courses; and educational programmes leading to academic degrees. The database contains training opportunities available in all regions of the world and its contents are updated frequently.

44. Other training activities are being facilitated through the efforts of UN-SPIDER partners. Policy-relevant advice is being provided and institutions are being twinned to institutionalize access to and use of space-based information. In addition, assistance is being provided in the framework of UN-SPIDER to help agencies obtain the infrastructure required to access and make use of such information.

B. Knowledge management

45. The acquisition, processing and transfer of knowledge should be seen as central to the success of the mission of UN-SPIDER. That includes managing the kind of knowledge that is held in an individual's brain in the form of know-how and experience and the kind of knowledge that is recorded in a variety of media. By building a knowledge base on how space-based information and solutions can support risk and disaster management and emergency response, knowledge can be made available through a knowledge portal and be used to support capacity-building.

46. Efforts continued during 2010, in coordination with the regional support offices, to compile, classify and disseminate relevant information on space-based technologies for disaster management, primarily by building up the content of the "space applications matrix" on the UN-SPIDER knowledge portal. In parallel, UN-SPIDER made efforts to identify relevant information sources and to obtain agreements to be able to freely reproduce and redistribute content from those sources.

47. UN-SPIDER staff contributed to the development of *Geoinformation for Disaster and Risk Management: Best Practices and Examples*, published in July 2010 by the Joint Board of Geospatial Information Societies and the Office for

Outer Space Affairs. The publication contains information on the potential uses of geo-information technologies, including Earth observation, to reduce the impact of natural or man-made disasters and risks, and compiles concise scientific contributions and knowledge from experts around the world in support of decision-making. The publication can be downloaded from the UN-SPIDER knowledge portal (www.un-spider.org/sites/default/files/JBGIS_UNOOSA_Booklet_0.pdf).

48. UN-SPIDER aims to foster and support communities focusing on issues related to disaster management and space-based information and solutions. Strengthening such communities is part of a recent approach that is supportive of the management and transfer of knowledge and that is based on a theory of social learning that describes dynamic groups, associated by communication and learning processes, dedicated to issues of joint interest. The sharing of knowledge is the essential process characterizing such communities.

49. Workshops, technical advisory missions and related international conferences have been used to establish and foster collaboration by enabling disaster management practitioners to meet space experts and each other and by offering a means by which communities can be established and developed through personal contact. Furthermore, the UN-SPIDER knowledge portal is being developed to facilitate communication among those networks by providing a web-based platform that allows for spontaneous communication, the generation and transfer of good-quality content and the possibility of maintaining a directory of members, a shared workspace and document repository.

50. UN-SPIDER has provided support to various existing communities and networks. Specifically, in 2010, it contributed to the work of an expert group focusing on capacity-building and the SPIDER Global Thematic Partnership.

Knowledge portal

51. The knowledge portal is central to the activities of UN-SPIDER, as it provides the means by which information on activities and their outputs can be collected, disseminated and archived. The purpose of the portal is to integrate all useful information, knowledge and resources identified and available to support the UN-SPIDER mandate, including those contributed by relevant user communities, and to serve as a platform for sharing space-based information on the disaster management cycle in general.

52. The portal provides services and tools for facilitating communication, supporting processes and disseminating information. It includes a news section, information on UN-SPIDER SpaceAid support in recent disasters and a calendar of events. Two main elements of the portal (the space application matrix and the visual globe tool) are being completed and should become available in 2011. From the homepage, links take users to pages labelled "SpaceAid", "advisory support", "knowledge base" and "network". The SpaceAid section contains information for using space technologies during emergency response operations; the knowledge base section provides information on technology, procedures, organizations and experts; and the network section includes links to UN-SPIDER regional support offices, national focal points, communities and a discussion board.

53. Throughout 2010, technical developments to the knowledge portal and the implementation of components continued. The content management system was

updated as new versions became available, and modules were further customized to address user requirements. The presentation of content was refined and new tools were developed and implemented to facilitate such presentation and the upload of content by users, in particular to enable users to provide specific content for the space applications matrix.

54. With regard to providing technical support to existing and new communities, enhancements made during 2010 to the current modules on the knowledge portal made it easier to upload presentation material and other content related to workshops. Additional editorial measures were taken to facilitate the use of the available tools for sharing knowledge.

C. Horizontal cooperation

55. The harmonization of various initiatives and the strengthening of cooperation among various partners are central for ensuring that Member States and international and regional organizations are able to access and use space-based information to support disaster management activities. Through UN-SPIDER, the Office for Outer Space Affairs is contributing to such efforts by ensuring the harmonization of initiatives that are contributing to or could contribute to helping developing countries access and use space-based technologies for disaster management and risk reduction. The Office continues to work with and contribute to the full implementation of existing and planned international and regional initiatives of relevance to the UN-SPIDER programme of work, contributing to enhancing coordination among all United Nations initiatives related to humanitarian and emergency response, as well as to those focusing on risk reduction and disaster management.

56. Relevant activities have included coordination with initiatives of the Group on Earth Observations (GEO) and the Committee on Earth Observation Satellites (CEOS), where the Office for Outer Space Affairs currently leads the disaster management interest group. In addition, UN-SPIDER staff participated in the Global Earth Observation System of Systems (GEOSS) workshop on European contributions to the GEO "disasters" societal benefit area, held in Brussels on 1 June 2010 and in a national Austrian GEO/GEOSS workshop held in Vienna on 25 November 2010.

57. UN-SPIDER organized the twenty-ninth plenary of the CEOS working group on information systems and services held in Bonn, Germany, from 17 to 21 May 2010. Representatives from various space agencies and related institutions met to discuss the status of the tasks and actions they were currently carrying out, including on the Global Datasets Interest Group, the Data Democracy Initiative, the Land Surface Imaging Interest Group, and the proposed water portal project, in the Applications Subgroup; the Web Services Interest Group, the Grid Interest Group and the Sensor Web Interest Group, in the Technology Subgroup. In addition, a special session entitled "Supporting disaster management from space: how can WGISS help" was organized.

58. Successful efforts were made in 2010 to improve interaction with other United Nations departments and agencies and to increase awareness of the mandate of UN-SPIDER. The continuing cooperation between the Office for Outer Space

Affairs and the Economic Commission for Africa, as co-chairs of the United Nations Geographic Information Working Group (UNGIWG), and the organization of the UN-SPIDER regional workshop held in Addis Ababa in July 2010, in cooperation with the Economic Commission for Africa, contributed to strengthening the work of UN-SPIDER within the United Nations system.

59. UNGIWG is a United Nations inter-agency coordination body that was established to discuss issues related to geographic information. It is estimated that well over 500 experts are currently employed in the United Nations system. In its capacity as UNGIWG co-chair, the Office for Outer Space Affairs organized the UNGIWG principals meeting on the United Nations Spatial Data Infrastructure held in Geneva on 29 and 30 November 2010. Sixteen participants representing 14 UNGIWG members attended the meeting. During the meeting, the set of United Nations Spatial Data Infrastructure framework deliverables were again endorsed by the participants. The eleventh plenary meeting of UNGIWG will be held in Geneva from 14 to 16 March 2011.

60. Taking into consideration the framework of thematic partnerships envisioned by ISDR in the context of the Hyogo Framework for Action, UN-SPIDER took advantage of the regional platform meetings to consolidate the SPIDER thematic partnerships focusing on the use of space-based information for disaster risk management. The partnerships are expected to provide guidance regarding space-based information for disaster management to the ISDR system in the context of the Strategy's global, regional and national platforms. In particular, during the Second Hemispheric Encounter on National Mechanisms and Networks for Risk Reduction, a special event was organized to launch the SPIDER Thematic Partnership for Latin America and the Caribbean.

61. The International Network of Crisis Mappers was launched at the International Conference on Crisis Mapping held in Cleveland, United States, from 16 to 18 October 2009. Especially in the aftermath of the devastating earthquake that struck Haiti early in 2010, the network proved to be valuable in providing mapping support to the international response community. UN-SPIDER staff participated in the Second International Conference on Crisis Mapping, held in Boston, United States, from 1 to 3 October 2010, and started exploring possibilities for collaborating with this vast group of experts, especially on topics such as the crowdsourcing of information and voluntary crisis mapping. UN-SPIDER staff delivered a presentation entitled "Ensuring access to space-based information to support relief efforts" (www.crisismappers.net/video/iccm-2010-ensuring-access-to).

62. UN-SPIDER participated in the nineteenth session of the General Assembly of the International Civil Defence Organization (ICDO), held in Geneva on 1 and 2 November 2010. ICDO is an intergovernmental organization that aims to contribute to the development of State structures that ensure the protection of and the provision of assistance to civilian populations, as well as to protect property and the environment from natural and man-made disasters. The Organization currently consists of 50 member States and various observers and affiliated members. On the occasion of the nineteenth session of the ICDO General Assembly, information on UN-SPIDER was presented and ways of cooperating with ICDO and its member civil defence/civil protection agencies were explored.

63. UN-SPIDER staff participated in various coordination events organized by the European Union, such as the European Union-African Union high-level policy meeting on space, held in Brussels on 15 September 2010, and the conference entitled "Space for the African citizen", also held in Brussels, on 16 September 2010. The aim of participating in those events was to demonstrate the relevance of space technologies, including in the field of disaster management.

D. Technical advisory support

64. Providing technical advisory support is one of the main activities of UN-SPIDER at the national level. By providing such support, UN-SPIDER contributes to identifying the existing national capacity to use space-based information, analysing the current institutional framework to support disaster risk management through space-based information and identifying existing constraints and gaps regarding the use of space-based information for disaster risk management.

65. During the biennium 2008-2009 UN-SPIDER provided technical advisory support to 13 countries: Afghanistan, Burkina Faso, Ecuador, Fiji, Ghana, Guatemala, Jamaica, Kenya, Maldives, Namibia, Samoa, the Philippines and Togo. In 2010, UN-SPIDER continued to provide support to Burkina Faso, Ecuador, Fiji, Guatemala, Jamaica, Maldives, Namibia, Samoa, the Philippines and Togo, and started providing support to Chile, Colombia, the Dominican Republic, Haiti, India, Madagascar and Malawi. Details on the extent of the support provided in 2010 are available in the report on technical advisory support activities carried out in 2010 in the framework of the United Nations Platform for Space-based Information for Disaster Management and Emergency Response (A/AC.105/985).

Support to emergency response

66. In an emergency, it is necessary to urgently assess the impact of and the needs resulting from the emergency. Space-based technologies provide innovative ways to generate information to meet those needs and to support the teams responding to the event.

67. In 2009, UN-SPIDER initiated the SpaceAid framework to help States and international and regional organizations to benefit from existing mechanisms and initiatives. Specifically, SpaceAid helps to do the following:

(a) To ensure that all end-users are able to access those mechanisms and initiatives 24 hours a day, seven days a week, and that they have the capacity to use all space-based information made available to them in emergencies;

(b) To provide guidance to existing mechanisms and initiatives on the specific requirements of end-users and on how to improve and extend the support provided;

(c) To establish additional opportunities beyond what is currently available within the existing mechanisms;

(d) To provide information to those interested in providing support (in the form of space-based information and expertise) on how and to whom to channel that support.

68. In 2010, support was provided through the SpaceAid framework in 29 emergencies, including the devastating earthquakes that struck Haiti (in January) and Chile (in February). Emergency support was provided in Benin, Burkina Faso, Chile, China, the Cook Islands, Guatemala, Haiti, Indonesia, Kazakhstan, Kenya, Madagascar, Myanmar, Pakistan, Panama, the Philippines, the Republic of Moldova, Senegal, the Solomon Islands, Sri Lanka, Sudan, Tajikistan, Thailand, Tonga, Turkey, Uganda and Ukraine, as well as in the Gaza Strip. In 2009, support was provided through the SpaceAid framework in 20 emergency events.

E. Activities carried out by the regional support offices

69. The UN-SPIDER regional support office in the Islamic Republic of Iran, hosted by the Iranian Space Agency, reported having carried out the following activities in 2010: in terms of outreach and capacity-building, it published and distributed books, broadcast a series of radio programmes, held public exhibitions, introduced sections on space technology to different high-school books and organized outreach workshops and expert meetings in Tehran. In addition, the office planned an international training course on applications of space technology for disaster management and executed a drought monitoring project. Furthermore, it maintained and upgraded the office's website, obtained web access to a satellite imagery archive and contributed to the further development of the UN-SPIDER knowledge portal. Five experts were identified to support UN-SPIDER technical advisory missions in the region.

70. The UN-SPIDER regional support office in Nigeria, hosted by that country's National Space Research and Development Agency, reported having carried out the following activities in 2010. It participated in a project management training course held by the Executive Secretariat of the International Charter on Space and Major Disasters; took part in a mock Charter activation exercise; and participated in a course on radar imagery analysis. The regional support office contributed to the review of the draft Nigerian national disaster management framework by recommending the inclusion of a space-based approach for disaster management and participated in the review of methods for flood mapping in Nigeria. It facilitated the enlisting of the National Emergency Management Agency of Nigeria as UN-SPIDER national focal point; provided technical support to the Agency for the processing of the radar imagery that was acquired through the International Charter on Space and Major Disasters during the flooding in northern Nigeria; and provided valuable technical support to the general directorate for nature conservation of Burkina Faso during the floods witnessed by that country in 2010.

71. The UN-SPIDER regional support office in Pakistan, hosted by the Space and Upper Atmosphere Research Commission, reported having carried out the following activities in 2010. It supported the activities in response to the severe floods that affected the country in July and August, upon request of the Government of Pakistan, by preparing and disseminating analysed satellite imagery and by providing real-time satellite data to national agencies through the establishment of an emergency "flood cell". Technical officers were seconded to the National Disaster Management Authority of Pakistan so as to assist in the proper utilization of satellite and related data. In terms of outreach activities, the regional support office in Pakistan prepared an awareness-raising brochure on satellite-based

information and emergency response and organized two training programmes to build capacity to enable space technology to be applied in different ways.

72. The UN-SPIDER regional support office in Romania, hosted by the Romanian Space Agency, reported having carried out the following activities in 2010. The office coordinated a national group of experts from the Romanian Space Agency, the meteorological service, the Centre for Remote Sensing Applications in Agriculture and the University of Agricultural Sciences in Bucharest. During the floods that took place in Romania in June and July 2010, the office utilized the GMES SAFER methodology of rapid mapping to monitor the affected areas and provided reliable support to local authorities. Upon request of the Agency for Land Relations and Cadastre of the Republic of Moldova, the office facilitated direct contact between the Agency and UN-SPIDER to facilitate the provision of data to evaluate the damages caused by floods at the local level, in addition to the flood maps produced by the office covering the regions bordering the river Prut. The office provided support to the Republic of Moldova for the organization of a training session, held in Chisinau in November 2010, aimed at informing representatives of entities involved in land surveying, agriculture and academia of actions to be taken in cases of emergency.

73. The UN-SPIDER regional support office in Ukraine, hosted by the National Space Agency of Ukraine, reported having carried out the following activities in 2010. In January 2010, the regional support office participated in a UN-SPIDER-led mission to Namibia, provided technical support in the area of flood mapping and collected ground-truth data to provide validation of flood mapping products. The office also provided satellite monitoring services of emergency situations in Ukraine and was involved in several activations of the International Charter on Space and Major Disasters, including in Namibia and Ukraine, and in the Gaza Strip. It organized a conference on Earth observation for sustainable development and security in June 2010, at which an opening ceremony for the UN-SPIDER regional support office in Ukraine was held. In addition, staff of the regional support office provided support to a summer school on advanced remote sensing for mapping, monitoring and managing the environment, held in Hanoi, and at which lectures were given on the radar monitoring of floods.

74. The UN-SPIDER regional support office hosted by the Asian Disaster Reduction Center reported having carried out the following activities in 2010: conducted surveys on users' needs, and organized seminars and training sessions on the implementation by the Association of Southeast Asian Nations of a project on the utilization of space-based technologies for disaster management in five countries. In addition, the regional support office continued to play a strong role in the Sentinel Asia project by acting as the focal point receiving emergency observation requests in the framework of Sentinel Asia. From January to December 2010, 32 emergency observations were made. The regional support office participated in a joint project team meeting held in Manila in July 2010.

75. The UN-SPIDER regional support office hosted by CATHALAC, reported having carried out the following activities in 2010. It participated in a UN-SPIDER technical advisory mission to the Dominican Republic, Guatemala and Jamaica and provided expert advice to the mission team. The regional support office also provided expert support during emergency situations by processing available Earth observation data and producing situation maps related to extreme events, including

in response to several tropical storms that hit the region in 2010, as well as volcanic eruptions and the devastating earthquakes that struck Haiti and Chile. Further information on products developed in response to those events can be downloaded from the CATHALC webpage (www.cathalac.org).

76. The UN-SPIDER regional support office hosted by the Regional Center for Mapping of Resources for Development reported having carried out the following activities in 2010. The Center acted as project manager and produced flood maps for the activation of the International Charter on Space and Major Disasters for Kenya in May 2010. In addition, the regional support office organized a regional training course on rapid hazard mapping, held in Nairobi in June 2010. Twenty participants from disaster management departments and national mapping institutions from countries in Africa attended the course, which aimed to familiarize disaster managers with the work of mapping institutions and show them how to use hazard maps and how to prepare maps rapidly. The course contributed to improving communication and working relations between agencies.

IV. Voluntary contributions

77. The successful implementation of the activities benefitted from the support and voluntary contributions (cash and in-kind) received from Governments and private sector entities, including:

(a) The Federal Ministry for Transport, Innovation and Technology of Austria, which in 2009 contributed 150,000 euros in support of capacity-building and outreach activities in 2009 and 2010;

(b) The Federal Ministry for European and International Affairs of Austria, which contributed 49,980 euros in support of six technical advisory missions to small island developing States between December 2009 and April 2010, and the services of an associate expert;

(c) The Government of Germany, which is contributing 150,000 euros a year during the period 2007-2011 to support the activities of the UN-SPIDER office in Bonn and the services of two associate experts;

(d) The Government of China, which is contributing 1,250,000 yuan a year during the period 2010-2013 to support the activities of the UN-SPIDER office in Beijing;

(e) The DLR, which provided the services of two senior experts (on a non-reimbursable loan basis) and support for the UN-SPIDER workshop held in Bonn;

(f) The Government of the Republic of Korea, which provided the services of an associate expert until February 2010;

(g) Turksat, which provided the services of two senior experts (on a non-reimbursable loan basis);

(h) The Secure World Foundation, which contributed US$ 15,000 to defray the travel costs for experts from developing countries to attend the UN-SPIDER regional workshop in July 2010;

(i)   The Environmental Systems Research Institute, Inc., which provided software and services for the UN-SPIDER knowledge portal and support for the UN-SPIDER workshop in Bonn;

(j)   The Earth Resource Data Analysis System, Inc., which provided software in support of the UN-SPIDER mandate;

(k)   DigitalGlobe, which provided the United Nations with free access to satellite imagery archives through a six-month evaluation license;

(l)   The following private and public institutions, listed in alphabetical order, which provided additional cash and in-kind contributions in support of specific UN-SPIDER activities: Citrix Online, City of Bonn, European Aeronautic Defence and Space Company, GeoEye, Pictometry, Techsoup and T-Systems;

(m)   The following institutions, listed in alphabetical order, which supported UN-SPIDER by providing the services of experts on technical advisory missions and special events organized by UN-SPIDER: Bolivarian Agency for Space Activities of the Bolivarian Republic of Venezuela, CATHALAC, Colombian Space Commission, National Commission on Space Activities of Argentina, National Space Agency of Ukraine, Organization of American States, Regional Centre for Space Science and Technology Education for Latin America and the Caribbean, South Asian Association for Regional Cooperation, and Thermopylae Sciences and Technology.