



# General Assembly

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## Committee on the Peaceful Uses of Outer Space

### **Report on the United Nations International Conference on Space-based Technologies for Disaster Management: Risk Assessment in the Context of Global Climate Change**

**(Beijing, 7-9 November 2012)**

#### **I. Introduction**

1. In its resolution 61/110, the General Assembly decided to establish the United Nations Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER) as a programme within the United Nations to provide universal access 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. The United Nations International Conference on Space-based Technologies for Disaster Management: Risk Assessment in the Context of Global Climate Change, held in Beijing from 7 to 9 November 2012, was the second such conference to be held in Beijing since the establishment of the UN-SPIDER Beijing Office in 2011. It is intended that the conference should become an annual event.

#### **A. Background and objectives**

3. Increased storms and floods along the coasts of the Asia and Pacific region, receding glaciers in the Himalayas, the Alps and the Andes, frequent and longer droughts in Africa, the European heat wave of 2003, frequent inland flooding in Central Europe and superstorm Sandy in 2012 are a few examples that raise questions about disaster risks and their linkages with weather extremes.

4. Several trends related to weather extremes have become sufficiently clear to highlight additional risks resulting from climate change and reinforce the need to



deal with these risks not in isolation, but rather as part of broader efforts to reduce the risk of natural disasters. The report entitled “Intergovernmental Panel on Climate Change, 2012: Summary for Policymakers”<sup>1</sup> assesses how exposure and vulnerability to weather and climate events determine the impacts and likelihood of disasters.

5. In view of the need to raise awareness among disaster managers about linkages between climate change extremes and disaster risk reduction, the United Nations International Conference on Space-based Technologies for Disaster Management: Risk Assessment in the Context of Global Climate Change was held in Beijing from 7 to 9 November 2012.

6. The conference was co-organized by the Office for Outer Space Affairs and the Ministry of Civil Affairs of China, in collaboration with the Ministry of Foreign Affairs of China, the China National Space Administration and the Asia-Pacific Space Cooperation Organization (APSCO), with the support of DigitalGlobe.

7. The conference offered a forum for disaster management communities and experts to strengthen their capabilities in using space-based information to assess, monitor and respond to disaster risks related to climate change and to integrate space technology into long-term disaster risk reduction efforts.

8. UN-SPIDER organizes such events to implement its mandate and its role within the United Nations, which is to promote the use of space-based information and its established networks that bring together national institutions responsible for disaster management and emergency response, as well as other end users and providers of space-based solutions and technologies. This is the second such conference organized in Beijing, following the successful conference in 2011.

9. The present paper provides a detailed summary of the conference in 2012 and its outcomes, as well as a short review of the conference in 2011.

## **B. Attendance**

10. UN-SPIDER provided funding for 22 participants from Member States, who were selected on the basis of their engagement with the UN-SPIDER programme and their role in disaster management in their respective countries. Other participants were selected based on their professional expertise and experience in disaster management, especially the use of space technology and geospatial information.

11. The conference brought together 131 participants from 23 countries who represented 64 organizations (national, regional, international and non-governmental organizations, as well as academia). The attendees came from civil protection agencies, disaster management agencies, space agencies, research

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<sup>1</sup> Intergovernmental Panel on Climate Change, “2012: Summary for Policymakers” in *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation*, C.B. Field and others, eds., A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change (Cambridge, United Kingdom, and New York, Cambridge University Press), pp. 3-21.

institutions, science and technology agencies, environmental and natural resources authorities and other government and non-governmental agencies.

12. The following countries were represented at the conference: Austria, Bangladesh, Cameroon, China, Fiji, Ghana, Indonesia, Japan, Jordan, Kenya, Lao People's Democratic Republic, Malawi, Mozambique, Niger, Nigeria, Pakistan, Samoa, Singapore, Sudan, Ukraine, United Kingdom of Great Britain and Northern Ireland, United States of America and Viet Nam. APSCO was also represented at the conference.

13. The conference was also attended by representatives of the United Nations Development Programme, the Office for the Coordination of Humanitarian Affairs, the Office of the United Nations High Commissioner for Refugees and the Office for Outer Space Affairs.

### **C. Programme**

14. At the opening ceremony, the Deputy Minister of Civil Affairs delivered welcoming remarks, which were followed by keynote presentations by representatives of UN-SPIDER and Wuhan University. These speeches helped set the tone for the conference by providing an overview of space technologies in the context of climate change and disaster risk reduction.

15. The conference was organized into six plenary sessions, during which a total of 33 technical presentations were delivered. Each session included a discussion period. In addition, three special sessions were organized to encourage discussions to develop workplans with UN-SPIDER and to develop bilateral and multilateral networks. Participants visited the National Disaster Reduction Centre of China to see its state-of-the-art infrastructure dedicated to space technology applications in disaster risk reduction.

## **II. Summary of plenary sessions**

16. Session one, on climate change and disaster risk, included five presentations, on the following topics: disaster and disaster management in China; climate change and its challenges for Mozambique; the atmospheric composition over Pakistan and related climate change impacts; the experience of Fiji with regard to disaster and risk management; and an overview of disasters in Malawi.

17. Session two, on information resources for disaster risk assessment, included five presentations, on the following topics: satellite systems for disaster management in China; DigitalGlobe satellite images for disaster management; space-based resources for disaster management in Africa; how CrisisCommons had organized technical volunteers to respond to disasters in Chile, Japan, New Zealand and Pakistan; and the Airborne remote sensing application for disaster reduction.

18. Session three, on space-based information applications, included five technical presentations, on the following topics: the application of remote sensing for disaster management in Indonesia; improvements in environmental information acquisition through advances in technology; best practices in Pakistan with regard to using space-based information for disaster management; variations in typhoon hazards

and disaster losses in China during the past 60 years; and disaster management using space technology in Bangladesh.

19. Session four, on risk assessment and mapping, included five technical presentations, on the following topics: flood risk mapping in China; assessment of the impact of the 2012 floods on food security in Nigeria using geographic information systems (GIS); the use of satellite data for drought monitoring and food security in Ukraine in the context of climate change; experiences and challenges related to drought risk management in Kenya; and climate change, land degradation and food security in Iraq: an integrated assessment using space technology.

20. Session five, also on risk assessment and mapping, included five technical presentations, on the following topics: crop insurance in the wake of disasters; the role of remote sensing technology and GIS in disaster management and climate change adaptation with regard to forest resources in Congo Basin countries; satellite monitoring of an oil spill in action; preparedness and rapid response based on geospatial information related to the great east Japan earthquake; and forestry disaster monitoring and assessment based on space remote sensing technology.

21. Session six, on network building, was aimed at discussing how UN-SPIDER and partner organizations had worked with Member States. It also included presentations from the countries where UN-SPIDER offered technical advisory missions. The session included eight technical presentations, on the following topics: the UN-SPIDER programme and technical advisory support activities; the National Disaster Reduction Centre of China and its technical support to UN-SPIDER; the role of the Regional Centre for Mapping of Resources for Development in disaster risk management; activities related to the recommendations of the UN-SPIDER technical advisory mission to the Sudan in 2011; community-based coastal flood disaster management in Nigeria: a new paradigm from the Regional Centre for Training in Aerospace Surveys; the APSCO Data-Sharing Service Platform and its application pilot projects; the UN-SPIDER technical advisory mission to Mozambique; and an overview of disaster management education and training in Pakistan.

### **III. Summary of special sessions**

#### **A. Drought monitoring: cooperation and partnership with China**

22. At the special session on drought monitoring, which was based on a similar session held during the first conference in Beijing in 2011, a representative of the National Disaster Reduction Centre of China outlined the background and objective of the session, which was to further enhance cooperation between China and Africa on drought monitoring. A representative of the Remote Sensing Authority of the Sudan presented the activities conducted by UN-SPIDER in the Sudan, including technical advisory missions and a planned follow-up activity on capacity-building. The UN-SPIDER Beijing office addressed existing gaps and opportunities between China and African countries with regard to drought monitoring under the framework of UN-SPIDER and based on the Horn of Africa mapping service facilitated by UN-SPIDER in 2011.

23. A representative of the Chinese Academy of Agricultural Science then presented the activities of a delegation of Chinese experts that had visited African countries in October 2012. A representative of the Beijing Normal University presented a drought monitoring system developed by that institution. A representative of the Remote Sensing Authority of the Sudan provided an overview of a UN-SPIDER technical advisory mission to the Sudan in 2011.

24. Based on the background and technical presentations, all of the participants expressed their strong interest in enhancing cooperation between China and African countries with regard to drought monitoring and risk assessment. The following recommendations were offered in that regard:

(a) Rapid mapping, risk assessment, pilot research and capacity-building should be considered key activities. UN-SPIDER should serve as a bridge and a platform for facilitating such activities;

(b) A workshop on Sino-African cooperation on drought monitoring based on space-based technology should be held with the support of UN-SPIDER involving experts and officials working in drought monitoring and management;

(c) Experiences learned in drought monitoring based on space-based information should be shared with communities at the national, regional and international levels;

(d) Capacity-building activities should be given priority;

(e) Sino-African cooperation on drought monitoring and risk assessment could be conducted at the regional level, in collaboration with existing regional initiatives or organizations, such as the Regional Centre for Mapping of Resources for Development (RCMRD) and the Economic Community of West African States (ECOWAS);

(f) For the long-term sustainability of such cooperation, since drought regularly hits Africa, long-term bilateral cooperation agreements should be signed between China and other countries;

(g) Some countries, such as Kenya and the Sudan, that had collaborated with regional agencies such as RCMRD and ECOWAS could be the pilot countries for drought monitoring cooperation.

## **B. Strengthening UN-SPIDER technical advisory support and follow-up activities**

25. The objective of the session on strengthening UN-SPIDER technical advisory support and follow-up activities was to provide insight into the activities carried out under the framework of UN-SPIDER.

26. A representative of UN-SPIDER gave a detailed presentation explaining the objectives of technical advisory support, which also included technical advisory missions to countries.

27. The representatives of Bangladesh and Mozambique gave a detailed presentation on the outcome of the UN-SPIDER technical advisory missions to their

countries and reported on the progress and future actions planned to incorporate space-based information into all stages of disaster management.

28. An opportunity was provided to all participants to highlight the current status of use of space-based information in disaster management and specific activities and issues to be addressed through the interventions of UN-SPIDER.

29. Experts from various organizations offered ideas about their support for such activities and expressed interest in collaborating with UN-SPIDER.

30. The discussions led to the development of plans for specific activities involving Member States and UN-SPIDER in 2013. They included new technical advisory missions in Asian and African countries and follow-up activities for Member States where such missions had already been carried out.

### **C. Rapid mapping services during emergencies**

31. The objective of special session two, on rapid mapping services during emergencies, was to provide insight into rapid mapping services available worldwide and support provided under the framework of UN-SPIDER to countries during emergencies.

32. The representative of DigitalGlobe gave a detailed presentation demonstrating the power of high-resolution images and the contribution of DigitalGlobe to providing such images during various disasters. The contributions of DigitalGlobe to 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) and UN-SPIDER were highlighted.

33. A representative of the National Disaster Reduction Centre of China provided an update on the rapid mapping experience gained by the Centre in providing support following major disasters in China. The international contribution of the Centre was also highlighted, especially the rapid mapping service offered through the UN-SPIDER framework to monitor drought in the Horn of Africa and the support provided during floods in Thailand in 2011.

34. A representative of UN-SPIDER provided details on the experience of working with the Indian Space Research Organisation and DigitalGlobe to provide support following the earthquake in Yunnan province, China, in September 2012. The representative of UN-SPIDER also provided information on existing mechanisms that provided rapid mapping services during major disasters and outlined the important issues that countries should consider as part of their preparedness for rapid mapping.

35. During the discussion period, participants explained their doubts on various issues, such as the cost of satellite images, access to satellite images before and after disasters, the availability of background geospatial data and mapping standards.

36. Participants were provided with information on how they could access rapid mapping services through cooperation with UN-SPIDER and partners like DigitalGlobe and the National Disaster Reduction Centre of China, as well as

international mechanisms such as the International Charter on Space and Major Disasters.

#### **IV. United Nations International Conference on Space-based Technologies for Disaster Risk Management: Best Practices for Risk Reduction and Rapid Response Mapping**

37. From 22 to 25 November 2011 in Beijing, UN-SPIDER and the Ministry of Civil Affairs of China successfully organized the United Nations International Conference on Space-based Technologies for Disaster Risk Management: Best Practices for Risk Reduction and Rapid Response Mapping, in collaboration with the Ministry of Foreign Affairs of China, the China National Space Administration, the National Disaster Reduction Centre of China, the Ministry of Civil Affairs of China, the Institute of Remote Sensing Applications of the Chinese Academy of Sciences and APSCO.

38. The conference brought together 120 experts from 45 Member States representing national, regional and international organizations, non-governmental organizations, the private sector and academia. Participants represented civil protection agencies, emergency management organizations, space agencies, remote sensing agencies, research institutions, ministries of environment and natural resources, science and technology bureaux and other Government agencies.

39. Through the conference, UN-SPIDER gathered elements to tailor its activities, especially in Asia and the Pacific and Africa, to identify strategies for bridging the gap between the space and disaster management communities and to improve communication and coordination among existing initiatives in Member States regarding access to and use of space-based technologies for disaster risk management, emergency response, portals and platforms contributing to disaster risk management and emergency response, rapid response mapping, capacity-building opportunities and regional networks.

#### **V. Conclusions**

40. The 2012 conference was built upon the conclusions of the discussions of the 2011 conference. In both conferences, UN-SPIDER encouraged the participation of officials from the national disaster management offices of developing countries and of regional support offices. The participation of officials from countries that were either engaged with UN-SPIDER or willing to engage in the near future was especially encouraged. Thus, the conferences have contributed significantly to strengthening the network.

41. The conferences have drawn the interest of academics, researchers and experts in the areas of disaster risk assessment, emergency response, remote sensing and GIS. Thus, the conferences have been successfully offering a platform to connect experts and end users.

42. At the 2012 conference, the technical presentations during the plenary sessions covered broad areas of space technology applications, while the special sessions

provided opportunities for Member States to discuss ideas for working with UN-SPIDER and partner organizations.

43. The 2012 conference also provided a platform for countries where UN-SPIDER had carried out technical advisory missions to report on their progress in implementing the recommendations of the technical advisory missions.

44. Member States, UN-SPIDER, regional support offices of UN-SPIDER and United Nations entities have taken up several elements from the conference for the development of a 2013 workplan and are planning specific events with UN-SPIDER.

45. Participants in the Conference acknowledged with appreciation the support of the Ministry of Civil Affairs of China, the China National Space Administration, the Ministry of Foreign Affairs of China, APSCO, the National Disaster Reduction Centre of China and DigitalGlobe.

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