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**Committee on the Peaceful  
Uses of Outer Space****Report on activities carried out in 2023 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 decided to establish a programme within the United Nations to provide universal access for 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 by being a gateway to space information for disaster management support, serving as a bridge to connect the disaster management and space communities and being a facilitator of capacity-building and institutional strengthening, in particular for developing countries.
2. At its fiftieth session, the Committee on the Peaceful Uses of Outer Space agreed that progress reports on the United Nations Platform for Space-based Information for Disaster Management and Emergency Response (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.
3. As part of the responsibility of the Office for Outer Space Affairs of the Secretariat for promoting international cooperation in the peaceful uses of outer space, and in line with its mandate, UN-SPIDER fosters knowledge management, builds bridges between 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 as needed.
4. The 27 regional support offices of UN-SPIDER are hosted by relevant national and regional organizations. Those offices provide, on a voluntary basis, regional coverage for UN-SPIDER activities, rendering valuable support from institutions specialized in Earth observation, disaster risk reduction and emergency response.
5. Most of the regional support offices also contribute pro bono to UN-SPIDER international conferences, capacity-building activities and technical advisory and institutional strengthening missions. They also provide content for the UN-SPIDER knowledge portal.
6. During this annual cycle, the University of Central Lancashire in the United Kingdom of Great Britain and Northern Ireland was incorporated as a regional support office.



7. The present report contains a summary of activities carried out under the UN-SPIDER programme in 2023.

## **II. Activities carried out in 2023**

8. The work of UN-SPIDER in 2023 was carried out with the resources allocated through the regular budget of the United Nations and with voluntary cash and in-kind contributions from Member States and collaborating entities.

9. An in-person meeting of focal points of UN-SPIDER regional support offices was held from 30 May to 1 June 2023. The meeting served as an opportunity to provide updates on ongoing and upcoming activities and discuss thematic issues as well as joint workplans and potential cooperation for 2024 and beyond.

10. As part of its technical advisory support activities (see sect. A below), UN-SPIDER carried out an institutional strengthening mission to South Africa, an expert mission combined with training to Nepal, training and institutional strengthening missions to the Pacific islands, and provided virtual support to Bolivia (Plurinational State of) and Malawi.

11. The outreach activities carried out by UN-SPIDER (see sect. B below) included workshops and training courses. UN-SPIDER also contributed to various outreach activities and training courses organized by its partners.

12. The programme supported emergency response operations in several countries and promoted the universal access initiative of the Charter on Cooperation to Achieve the Coordinated Use of Space Facilities in the Event of Natural or Technological Disasters (also referred to as the International Charter on Space and Major Disasters) among disaster management authorities of countries in Africa, Asia and the Pacific and Latin America and the Caribbean.

13. In addition, the programme continued to raise awareness regarding the Copernicus Emergency Mapping Service and the Copernicus Risk and Recovery Service.

14. In this annual cycle, UN-SPIDER contributed to the elaboration of a flagship publication on multi-hazard early warning systems to be published by the United Nations Office for Disaster Risk Reduction (UNDRR), and it elaborated its own flagship publication on “Space technologies for early warning systems”. The publication provides examples of the use of such space technologies, products and services in early warning systems in the case of hydrometeorological, geological, environmental, extraterrestrial, coastal, biological and health hazards. The publication will be launched in the spring of 2024.

### **A. Technical advisory support**

15. The technical advisory support activities carried out in 2023 included an institutional strengthening mission to South Africa, an expert mission with training to Nepal, institutional strengthening missions with training in the Pacific islands, and the provision of virtual technical advisory support to Bolivia (Plurinational State of) and Malawi.

#### **1. Institutional strengthening mission to South Africa, 8–12 May 2023**

16. UN-SPIDER carried out an institutional strengthening mission to South Africa from 8 to 12 May 2023 to support the National Disaster Management Centre in its utilization of space-based technologies for disaster management. The mission included meetings with high-ranking officials and staff of the Centre, the South African National Space Agency, the South African Weather Service, the Department of Agriculture, the Agricultural Research Council, the Council for Scientific and Industrial Research and other institutions. The mission also included a three-day

workshop on the use of space technologies in early warning and disaster management efforts with a focus on floods and droughts.

17. The mission was implemented in coordination with the National Disaster Management Centre and benefited from the support provided by experts from the Centre for Remote Sensing of Land Surfaces (ZFL) of the University of Bonn.

18. The three-day workshop included presentations on the UN-SPIDER recommended practices for flood mapping and drought monitoring, the Global Flood Awareness System and the Global Drought Observatory of the Copernicus programme, and the activations of the International Charter on Space and Major Disasters in response to major disasters in South Africa.

19. The mission allowed UN-SPIDER and its partners to continue stakeholder relations with key South African institutions, to promote the use of space-based information in applications related to disaster preparedness and response, and to continue the implementation of the Flood Guide pilot project led by UN-SPIDER.<sup>1</sup>

## **2. Institutional strengthening mission to Tonga, 5–8 December 2023**

20. In conjunction with the awareness-raising and capacity-strengthening activities in the Pacific islands (see paras. 52–54) and benefiting from the presence of its experts in the region (two UN-SPIDER staff, one expert from the Asian Institute of Technology Regional Support Office and one from the Committee on Earth Observation Satellites (CEOS) Working Group on Disasters), UN-SPIDER organized a follow-up mission to Tonga. The follow-up mission was prepared in consultation with national authorities and the main objective was to review the progress made in the country with regard to use of space technologies in disaster management processes since the earlier technical advisory mission took place.

21. National focal points mobilized experts from the Tonga Fire and Emergency Services, the National Disaster Risk Management Office, the Department of Climate Change, Tonga Meteorological Services, Tonga Police, the Armed Forces, the Ministry of Health, the Ministry of the Environment, the Ministry of Lands and Natural Resources, the Tonga Water Board, the Ministry of Agriculture and Food, Forests and Fisheries, and a number of donor representatives were invited to a national consultation that brought all stakeholders together. Following the consultation, several institutional visits and follow-up discussions took place, the results of which will be summarized and reported to the national authorities for follow-up.

## **3. Scoping mission to French Polynesia, 11–14 December 2023**

22. Following the institutional strengthening mission to Tonga, UN-SPIDER staff visited French Polynesia, at the invitation of the National Land Registry. The visit was a scoping mission, to establish connections, inform relevant government authorities of the work and services of UN-SPIDER, and assess interest in possible advisory missions or other support activities in the future. Discussions were held with various stakeholders, and the local interest in improving geospatial coordination and dialogue among Pacific island States was noted.

## **4. Virtual support to Malawi**

23. Malawi experienced severe floods in February 2023 caused by Tropical Storm Ana. UN-SPIDER generated several maps of flooded areas which were provided to

<sup>1</sup> For more information on the mission, see Office for Outer Space Affairs, UN-SPIDER knowledge portal, “UN-SPIDER’s institutional strengthening mission to South Africa”, 10 May 2023. For information on the workshop, see Office for Outer Space Affairs, UN-SPIDER knowledge portal, “UN-SPIDER, NDMC and ZFL organize an interinstitutional workshop in South Africa”, 11 May 2023.

the National Department of Disaster Management Affairs for use in disaster response operations.

#### **5. Virtual support to the Plurinational State of Bolivia**

24. Having taken note of the extreme drought conditions that affected the Plurinational State of Bolivia and other Andean countries in the fall of 2023, UN-SPIDER and the Federal University of Santa Maria of Brazil, in its role as a UN-SPIDER regional support office, generated and provided more than 500 maps of the standard vegetation index of the Plurinational State of Bolivia to the Bolivian Space Agency. UN-SPIDER explained the usefulness of such maps to the experts of the Agency in monitoring the effects of drought on vegetation and comparing the current impacts of droughts in the Plurinational State of Bolivia with the impacts of historic droughts which may have taken place between 2000 and 2022.

### **B. Outreach and networking activities**

25. The present section covers: (a) events organized or co-organized under the UN-SPIDER programme; and (b) contributions to events organized on the initiative of various partner organizations.

#### **1. Events organized or co-organized under the UN-SPIDER programme**

##### **(a) UN-SPIDER/German Aerospace Centre/Global Flood Awareness System/Centre for Remote Sensing of Land Surfaces workshop on space technologies for flood management, 20–22 February 2023**

26. UN-SPIDER, the German Aerospace Centre (DLR), the Global Flood Awareness System of the Copernicus programme of the European Commission, and ZFL of the University of Bonn organized an international training workshop on space-based technologies for flood management. The workshop was held at the United Nations Bonn Campus from 20 to 22 February 2023.

27. The workshop brought together 24 participants from national disaster management agencies, space agencies, government agencies, and students enrolled in universities from various countries including Algeria, Barbados, Germany, Ghana, Italy, Kenya, Mexico, Mozambique, Nigeria, Pakistan, South Africa, Spain, Sri Lanka, Türkiye, Uganda and the United Kingdom of Great Britain and Northern Ireland.

28. The purpose of the event was to increase the awareness of and develop capacity in novel techniques and tools developed by DLR, the Copernicus programme and UN-SPIDER, which are useful in flood early warning systems and flood management.

29. During the training, participants gained skills in using geospatial information technologies, Earth observation, the Global Flood Awareness System and rapid flood mapping tools. In addition, a simulation exercise was carried out to allow participants to apply and test the skills they had acquired through the training.<sup>2</sup>

##### **(b) Annual meeting of UN-SPIDER regional support offices, 30 May–1 June 2023**

30. The annual meeting of UN-SPIDER regional support offices was attended by representatives of 15 offices. UN-SPIDER used the opportunity to brief the representatives on ongoing and upcoming activities. The meeting included presentations on relevant work by all current regional support offices and candidate offices. In addition, discussion sessions were held on topics such as the engagement of end users, gender inclusivity and the potential for cooperation between regional support offices.

31. The meeting facilitated the identification of joint activities to be organized in 2024 and discussions on potential project proposals and other resource mobilization

<sup>2</sup> More information on the workshop is available at [www.un-spider.org/news-and-events/news/un-spiderdlrglofaszfl-workshop-space-technologies-flood-management](http://www.un-spider.org/news-and-events/news/un-spiderdlrglofaszfl-workshop-space-technologies-flood-management).

efforts, to be submitted to potential donors in order to continue implementing UN-SPIDER activities worldwide.<sup>3</sup>

**(c) Virtual meetings of UN-SPIDER regional support offices, 12 September and 8 December 2023**

32. During the annual meeting of UN-SPIDER regional support offices, the decision was made to have regular virtual meetings to strengthen the link and collaboration among the regional support offices. The first virtual meeting took place on 12 September 2023 and was attended by 24 representatives. The second virtual meeting took place on 8 December 2023 and was attended by 13 representatives.

33. At the virtual meeting on 12 September 2023, the regional support office of Greece at the BEYOND Centre of Earth Observation Research and Satellite Remote Sensing of the National Observatory of Athens, together with partners from the Fraunhofer Institute for High Frequency Physics and Radar Techniques and EDGE in Earth Observation Sciences, presented information on the Firelogue project and its platform.

34. At the virtual meeting on 8 December 2023, the regional support office of the United Kingdom at the University of Central Lancashire presented on its activities, focusing on climate change, coastal vulnerability and disasters.

**(d) Subforum on Disaster Prevention, Reduction and Relief of the 2023 Belt and Road Forum for International Cooperation, 11 and 12 October 2023**

35. The Subforum was organized by the National Disaster Risk Reduction Centre of the Ministry of Emergency Management and was hosted by the Ministry of Emergency Management of China, in collaboration with UN-SPIDER and the Administrative Center for China's Agenda 21. The Subforum took place on 11 and 12 October 2023 in Beijing.

36. Nearly 200 participants participated in the event, including about 120 representatives from China, 72 representatives from 8 United Nations agencies, 4 international and regional organizations, 4 scientific research institutions and 13 countries: Indonesia, Kyrgyzstan, Mexico, Micronesia (Federated States of), Mongolia, Pakistan, Serbia, Singapore, South Africa, Tajikistan, Thailand, Tonga and Uzbekistan.

37. The Subforum was held to promote the application of advanced technologies in natural disaster prevention and relief, to exchange good practices in disaster prevention, reduction and relief, to facilitate cooperation among countries along the Belt and Road Initiative, to contribute to the modernization of regional natural disaster prevention and control systems and capabilities, and to contribute to the achievement of the goals of the Sendai Framework for Disaster Risk Reduction 2015–2030 and the 2030 Agenda for Sustainable Development.

38. The Subforum was held back-to-back with the following events supported by UN-SPIDER: the Seminar on Satellite Data in Support of Early Warning for All and the China-Pacific Island Countries Emergency Management Cooperation Working Level Consultation Meeting.<sup>4</sup>

**(e) UN-SPIDER/Algerian Space Agency/Centre for Remote Sensing of Land Surfaces workshop on space-based solutions for forest fires in Algeria, 21 and 22 November 2023**

39. In order to enhance the use of space technologies in dealing with forest fires, UN-SPIDER, the Algerian Space Agency and ZFL of the University of Bonn joined

<sup>3</sup> More information on the meeting is available at [www.un-spider.org/news-and-events/news/un-spider-regional-support-offices-meeting-2023](http://www.un-spider.org/news-and-events/news/un-spider-regional-support-offices-meeting-2023).

<sup>4</sup> More information on the subforum is available at [www.un-spider.org/news-and-events/news/subforum-disaster-prevention-reduction-and-relief-inaugurated-beijing-china](http://www.un-spider.org/news-and-events/news/subforum-disaster-prevention-reduction-and-relief-inaugurated-beijing-china).

forces to organize the workshop on “Space-based solutions for forest fires in Algeria”. This workshop was held at the International Conference Centre in Algiers on 21 and 22 November 2023. It brought together nearly 30 experts and professionals from the General Directorate of Forests, the Algerian Civil Protection Directorate, the National Risk Management Authority, the Algerian Space Agency, several university researchers, the UN-SPIDER regional support offices in Colombia, Germany, Greece and the United States of America, and staff of UN-SPIDER.

40. The workshop included presentations by the Algerian Space Agency, the General Directorate of Forests, the Algerian Civil Protection Directorate, the University of Algeria, the BEYOND Centre of Earth Observation Research and Satellite Remote Sensing of the National Observatory of Athens, the Agustín Codazzi Geographic Institute of Colombia, Delta State University of the United States, ZFL, the European company ARGANS and UN-SPIDER.<sup>5</sup>

## 2. Organization of training courses

41. During this annual cycle, UN-SPIDER organized or supported several international training courses and contributed to the organization of additional training courses organized by partner institutions.

### (a) Economic and Social Commission for Asia and the Pacific/Asian and Pacific Training Centre for Information and Communication Technology for Development and UN-SPIDER National Training on Digital Technologies for Disaster Risk Management in Nepal

42. Jointly with the Asian and Pacific Training Centre for Information and Communication Technology for Development of the Economic and Social Commission for Asia and the Pacific, UN-SPIDER sponsored 37 experts from the National Disaster Risk Reduction and Management Authority of Nepal to strengthen their capacity to use multi-hazard risk assessment solutions and platforms in their work. The national authorities deeply appreciated the timely training and requested the Asian and Pacific Training Centre and UN-SPIDER to organize a follow-up training to reach the local disaster managers of 753 municipalities across the country, with a focus on spatial modelling of hazards and risks. This follow-up major support activity is planned for 2024.

### (b) UN-SPIDER/German Agency for International Cooperation/Mexican Space Agency/Directorate-General for Civil Protection training course in El Salvador, 17 May–14 July 2023

43. At the request of the Directorate-General for Civil Protection of El Salvador, and with the support of the Mexican Space Agency, UN-SPIDER and the German Agency for International Cooperation (GIZ) organized a hybrid training course between 17 May and 14 July 2023. The training course targeted 45 participants from government agencies, universities and non-governmental organizations in El Salvador. It began with virtual presentations by experts from UN-SPIDER, GIZ, the Central American Integration System, the Coordination Centre for the Prevention of Natural Disasters in Central America and the Dominican Republic and the Mexican Space Agency. This virtual segment of the training course was held from 17 to 26 May 2023.

44. The training course included two in-person sessions which were held at the Andrés Bello University in San Salvador. The first session, held from 29 May to 2 June, was used to introduce participants to the theoretical aspects of radar imagery and the basics regarding the processing of such imagery to extract relevant features. The second in-person training session, held from 10 to 14 July, focused on the use of radar imagery to generate maps of flooded areas. This second session introduced

<sup>5</sup> More information on this workshop is available at [www.un-spider.org/news-and-events/news/un-spider-asal-zfl-workshop-organized-algeria](http://www.un-spider.org/news-and-events/news/un-spider-asal-zfl-workshop-organized-algeria).

participants to the two UN-SPIDER recommended practices that have been developed to process radar imagery to generate maps of flooded areas.<sup>6</sup>

**(c) UN-SPIDER/German Aerospace Centre/International Charter on Space and Major Disasters/Centre for Remote Sensing of Land Surfaces training course in Bonn, 18–20 July 2023**

45. UN-SPIDER joined forces with the International Charter on Space and Major Disasters, DLR and ZFL of the University of Bonn to organize a joint training course on the use of the European Space Agency (ESA) Charter Mapper. The training workshop was held at the United Nations campus in Bonn, Germany, from 18 to 20 July 2023, and brought together 15 project managers and value-added providers from Algeria, Belarus, Colombia, Eswatini, Ethiopia, Germany, Madagascar, Nigeria, South Africa and Sri Lanka, as well as the non-governmental organization Doctors without Borders.

46. The training course was carried out by experts from ESA, Terradue, ARGANS and DLR. It allowed participants to enhance their skills in the use of the Charter Mapper to process satellite imagery in case of floods, forest fires, earthquakes and landslides.<sup>7</sup>

47. In the weeks and months that followed the training course, some of the participants made use of the Charter Mapper in activations of the International Charter on Space and Major Disasters in response to forest fires in Algeria and floods in Ghana.

**(d) Summer University Network training course on “Geospatial technologies for building resilience” at the Central European University in Budapest, 24–28 July 2023**

48. As course co-organizer, UN-SPIDER sponsored 10 participants from Africa and Central Asia and contributed lectures to the Summer University course on “Geospatial technologies for building resilience”, which was organized by the Central European University GeoHub. This course was designed to address the gap between the potential of geospatial technologies and the world of environmental decision makers and policymakers by providing in-service education and professional training for decision makers and practitioners to assist them in making better informed data-driven decisions. A total of 47 young professionals and mid-career government experts attended.

**(e) UN-SPIDER/Economic Commission for Latin America and the Caribbean/International Charter on Space and Major Disasters training course in Chile, 7–9 November 2023**

49. As a follow-up to the training course organized with the International Charter on Space and Major Disasters in Bonn in July, UN-SPIDER, the Economic Commission for Latin America and the Caribbean and the International Charter on Space and Major Disasters joined forces to organize the training course “Project management using the ESA Charter Mapper”. This training course brought together 15 professionals with skills in project management of activations of the International Charter on Space and Major Disasters from Argentina, Bolivia (Plurinational State of), Brazil, Chile, Colombia, Costa Rica, Ecuador, Mexico, Paraguay and Peru. The training course was held at the headquarters of the Economic Commission for Latin America and the Caribbean in Santiago from 7 to 9 November 2023.

50. The training course benefited from the support of trainers from the National Commission on Space Activities (CONAE) of Argentina and the National Institute for

<sup>6</sup> More information on the training course is available at [www.un-spider.org/news-and-events/news/second-phase-joint-un-spidergizaemdpc-training-course-el-salvador-completed](http://www.un-spider.org/news-and-events/news/second-phase-joint-un-spidergizaemdpc-training-course-el-salvador-completed) and [www.un-spider.org/news-and-events/news/joint-un-spidergizaemdpc-training-course-el-salvador](http://www.un-spider.org/news-and-events/news/joint-un-spidergizaemdpc-training-course-el-salvador).

<sup>7</sup> More information on this training course is available at [www.un-spider.org/news-and-events/news/un-spiderdlrinternational-charterzfl-international-workshop-bonn](http://www.un-spider.org/news-and-events/news/un-spiderdlrinternational-charterzfl-international-workshop-bonn).



Space Research (INPE) of Brazil, which are members of the International Charter on Space and Major Disasters. The training course included presentations by the Economic Commission for Latin America and the Caribbean on its efforts regarding geospatial information management, damage and loss assessments, and environmental assessments. The trainers from CONAE and INPE introduced participants to the Charter Mapper and then the participants were divided into four groups to use it to process satellite imagery used in the case of floods, landslides, forest fires and earthquakes. Participants with recent experience in activations of the International Charter commented that it would speed up and facilitate the generation of relevant products to be used in disaster response efforts.<sup>8</sup>

51. In the weeks following the training course, some of the participants used the Charter Mapper to contribute to the generation of maps of flooded areas in Argentina, Brazil and Paraguay resulting from severe floods that demanded the activation of the International Charter on Space and Major Disasters.

**(f) UN-SPIDER awareness-raising workshop and Economic and Social Commission for Asia and the Pacific/Asian and Pacific Training Centre for Information and Communication Technology for Development training on digital technologies in multi-hazard risk assessment for Pacific island professionals, held in Suva on 1–4 December 2023**

52. In an effort to better support the small island developing States in the Pacific region, and in line with the donor priorities of China, UN-SPIDER collaborated with the Pacific GIS and Remote Sensing Council to co-locate its planned regional awareness-raising workshop and back-to-back digital technologies training with the Pacific Islands GIS and Remote Sensing Conference held in Suva from 27 November to 1 December 2023.

53. A total of 26 experts mainly from Pacific island States disaster management authorities, natural resource and land management authorities and other related governmental or non-governmental organizations were sponsored to attend the full Conference and to participate in a one-day awareness-raising workshop (1 December) on UN-SPIDER support and space technology resources for disaster management, as well as in the subsequent Economic and Social Commission for Asia and the Pacific/Asian and Pacific Training Centre for Information and Communication Technology for Development training course (2–4 December).

54. The co-organized capacity strengthening and awareness-raising activities resulted in a stronger connection to the Pacific islands geospatial and disaster management communities, and several requests for follow-up training, data access facilitation and technical advisory missions to some of the island States. These requests will be gradually built into the 2024 workplan of the UN-SPIDER Beijing office and be considered in the fundraising efforts for UN-SPIDER.

**3. Organization of or contributions to other initiatives, events, and webinars**

55. Following an invitation from the organizers, a UN-SPIDER staff member was nominated to participate on behalf of the Acting Director of the Office for Outer Space Affairs in the Global Sustainable Technology and Innovation Community Conference hosted in Rio de Janeiro, Brazil, from 13 to 15 February 2023. A keynote presentation on Office and UN-SPIDER efforts was delivered in a session dedicated to Earth observation and the Sustainable Development Goals.

56. During the last week of February, UN-SPIDER undertook a scoping mission to Bishkek, invited and supported by the Austria-based Central European University GeoHub. The mission included visits to the national disaster management authorities as well as an open lecture on UN-SPIDER mandates and efforts delivered to

<sup>8</sup> More information on this training course is available at [www.un-spider.org/news-and-events/news/un-spider-eclac-international-charter-training-course-latin-america](http://www.un-spider.org/news-and-events/news/un-spider-eclac-international-charter-training-course-latin-america).



approximately 50 government officials, academic staff and students at the American University of Central Asia.

57. UN-SPIDER contributed to a training course for students enrolled in the master of science programme in “Geography of environmental risks and human security”, offered jointly by the United Nations University Institute for Environment and Human Security and the Department of Geography of the University of Bonn. The training course, which was held from 21 February to 9 March 2023, was designed to provide students with an introduction to the use of geographic information system tools, including QGIS and Google Earth Engine, and analytical methods for analysis and remote sensing.

58. UN-SPIDER staff participated, as invited, in the United Nations Maps Conference, following inter-agency geospatial coordination discussions hosted at the United Nations Global Service Centre in Valencia, Spain from 6 to 10 March 2023. Two presentations on the work of the Office for Outer Space Affairs and UN-SPIDER were delivered to the audience, and UN-SPIDER led a discussion among participating agencies on commercial satellite imagery procurement coordination and sharing.

59. UN-SPIDER actively participated in the International Academy of Astronautics/Office for Outer Space Affairs Planetary Defence Conference which was organized at the United Nations Office at Vienna from 3 to 7 April 2023. The opportunity was used to present on the efforts being made through the programme to raise awareness regarding planetary defence efforts being implemented by the space community through the International Asteroid Warning Network and the Space Mission Planning Advisory Group.

60. UN-SPIDER staff participated in the annual session of the Committee of Experts on Global Geospatial Information Management at the United Nations Headquarters in New York, from 31 July to 4 August, contributing, as invited, to side events of the Working Group on Geospatial Information and Services for Disasters and of the United Nations Geospatial Network, where the leading role of the Office for Outer Space Affairs in satellite imagery coordination matters was reinforced. This came after the Office’s participation in the special meeting of the United Nations Geospatial Network at the United Nations Office at Nairobi in June 2023, where the One United Nations Geospatial Situation Room was launched. The Office for Outer Space Affairs through UN-SPIDER is co-leading the efforts related to satellite imagery in the context of the Situation Room.

61. UN-SPIDER was invited to participate in the International Workshop on Aerospace Application of Earthquake Early Warning and Quick Response, which was organized by the Asia-Pacific Space Cooperation Organization (APSCO) in Istanbul, Türkiye, from 23 to 25 October 2023. The workshop was organized in collaboration with the Space Agency and the Ministry of Industry and Technology of Türkiye, and was supported by the Ministry of Environment, Urbanization and Climate Change of Türkiye, the Disaster and Emergency Management Authority of Türkiye, the National Institute for Natural Hazards of the Ministry of Emergency Management of China, and the Office for Outer Space Affairs. The workshop brought together around 110 participants from Bangladesh, Belgium, China, Cuba, Iran (Islamic Republic of), Italy, Mongolia, Pakistan, Peru, the Russian Federation, Thailand, Türkiye and the United States of America.

62. APSCO, the Space Agency of Türkiye and the Ministry of Industry and Technology of Türkiye also organized a two-day training course, back-to-back with the workshop. UN-SPIDER staff made presentations at the workshop and the training course and mobilized two participants from Cuba to attend both events.<sup>9</sup>

63. UN-SPIDER staff from Bonn and Vienna attended the International Conference on Space and Global Health organized by the Office for Outer Space Affairs together

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<sup>9</sup> More information on the workshop and the training course is available at [www.un-spider.org/news-and-events/news/apSCO-international-workshop-and-training-course-istanbul](http://www.un-spider.org/news-and-events/news/apSCO-international-workshop-and-training-course-istanbul).

with the World Health Organization (WHO) and the United Nations Conference on Trade and Development (UNCTAD) from 1 to 3 November 2023 in Geneva. Contributions were made to the special session of the conference on disaster and health emergency management, and bilateral meetings were held with UNDRR, the Office for the Coordination of Humanitarian Affairs, UNCTAD, the United Nations Institute for Training and Research, WHO and the Group on Earth Observations secretariat, focused on cooperation and contributions to the Early Warnings for All initiative.

64. UN-SPIDER staff represented the Office for Outer Space Affairs at the Group on Earth Observations Plenary Week and Ministerial Summit in Cape Town, from 6 to 10 November 2023, and held bilateral coordination meetings with various partners.

65. UN-SPIDER staff participated on behalf of the Office for Outer Space Affairs (in its capacity as Associate Member) in the 37th CEOS Plenary that took place from 15 to 17 November 2023 in Chiang Rai, Thailand, hosted by the Geo-Informatics and Space Technology Development Agency of Thailand. During the plenary, the nominated UN-SPIDER representative was approved as the incoming Vice-Chair of the CEOS Working Group on Disasters for the next two years, and as future Chair for the period 2026–2027, with the aim of helping to improve communication and coordination among space agencies in their disaster support efforts.

## C. Knowledge management

66. Knowledge management is at the core of UN-SPIDER activities. By systematically and continuously compiling knowledge and available resources held by individuals and institutions, UN-SPIDER aims to transfer lessons learned, highlight innovations and foster collaborative practices. The communities involved in the field of work of UN-SPIDER include many different actors: disaster responders, disaster risk specialists, policymakers, remote sensing experts, space technology providers, academics and researchers.

### 1. Knowledge portal

67. The UN-SPIDER knowledge portal ([www.un-spider.org](http://www.un-spider.org)) continues to be one of the cornerstones of the programme, as it hosts information on all activities carried out by the programme and by the disaster management, emergency response and space communities. By the end of 2023, the total number of content items had increased to approximately 9,500. The sections of the knowledge portal with the highest growth rates included the news, events (including training events), data sources and disaster management sections.

68. The average number of monthly visits to the knowledge portal decreased from an average of 42,000 users per month in 2022 to around 36,000 users per month in 2023. The largest numbers of portal visitors were from the Philippines, the United States, India, Nigeria, Kenya, Mexico and Germany (in descending order of number of visitors).

69. During this cycle, efforts were made to incorporate additional content into the Spanish and French versions of the knowledge portal. As a result, the number of visits to the Spanish version of the portal continued to increase compared with previous years.

70. In order to facilitate the discovery of relevant content in the knowledge portal and encourage users to explore related pages, the website's information architecture has been further improved by linking content that covers the same natural hazards, space technologies and UN-SPIDER activities.

71. UN-SPIDER has also improved the links on the knowledge portal to the activities of the regional support offices and the hazards that those activities address.

## 2. Use of cloud-based solutions

72. UN-SPIDER continued to promote the use of cloud-based geographic information system solutions. Examples include the use of online data analytics platforms and systems such as Google Earth Engine in recommended practices and the promotion of web-based systems and applications such as the cloud-based ESA Charter Mapper tool of the International Charter on Space and Major Disasters.

## D. Support in case of emergencies

73. As part of its activities, UN-SPIDER facilitated activation of the International Charter on Space and Major Disasters on three occasions:

(a) On behalf of the Disaster Management and Mitigation Unit of the Office of the Vice President of Zambia at the end of January 2023. The request was elevated owing to the severe floodings in Southern, Central and Lusaka provinces. An expert from the International Water Management Institute, which is a UN-SPIDER regional support office, served as project manager in the activation;<sup>10</sup>

(b) On behalf of the National Institute of Disaster Management of Mozambique in February 2023. The request was elevated owing to the very large floods triggered by heavy rainfall in the Maputo province. The expert from the International Water Management Institute served as project manager for this activation as well;<sup>11</sup>

(c) On behalf of the National Disaster Management Organization of Ghana in response to widespread flooding in the south-eastern region of the country in October 2023. The crisis was triggered by the overflowing of the Akosombo dam, resulting in the devastating destruction of homes and farmlands along the banks of the Volta River. An expert from the National Space Research and Development Agency of Nigeria, a UN-SPIDER regional support office, served as project manager in the activation. UN-SPIDER staff supported the activation as value-added providers;<sup>12</sup>

(d) UN-SPIDER provided advisory support to the Disaster and Emergency Management Authority of Türkiye during the activation of the International Charter on Space and Major Disasters. The Authority was designated as project manager for this activation.

74. In several other significant but not major disaster events during 2023, and at the request of local disaster management authorities or UN-SPIDER regional support offices, other data provider partners and mechanisms were also activated directly by UN-SPIDER to provide affected countries with rapid access to very high-resolution satellite imagery, mostly synthetic aperture radar but also optical, including from agile new private sector satellite operators in China.

## 1. Training courses and other activities co-organized with the International Charter on Space and Major Disasters

75. As described in section B.2, UN-SPIDER joined forces with the International Charter on Space and Major Disasters to organize two training courses for project managers and value-added providers on the use of the Charter Mapper. One was held in Bonn from 18 to 20 July and mainly targeted participants from Africa and Europe, and the second was held in Chile from 7 to 9 November, targeting participants from Latin America.

<sup>10</sup> More information on this activation is available at <https://disasterscharter.org/web/guest/activations/-/article/flood-large-in-zambia-activation-796->.

<sup>11</sup> More information on this activation is available at <https://disasterscharter.org/web/guest/activations/-/article/flood-large-in-mozambique-activation-801->.

<sup>12</sup> More information on this activation is available at <https://disasterscharter.org/web/guest/activations/-/article/flood-large-in-ghana-activation-844->.

## **2. Raising awareness of the Copernicus Emergency Mapping Service**

76. In addition to the International Charter on Space and Major Disasters, the Copernicus Emergency Mapping Service was also highlighted and described in detail in statements and presentations at international events and missions during the reporting period, with a view to increasing the familiarity of disaster managers worldwide with all the mechanisms at their disposal.

77. Staff of the National Civil Defence of Cuba were briefed on the International Charter and were advised to request that the National Civil Defence be made an authorized user of the International Charter.

## **3. Broaden data access channels to more commercial satellite operators**

78. China-based commercial radar satellite imaging companies voluntarily provided very high-resolution synthetic aperture radar images (valued at over \$325,000) directly to affected countries, with requests relayed by the UN-SPIDER Beijing office, and mainly for disaster response efforts related to cyclones in Bangladesh, Solomon Islands and Vanuatu, Hurricane Otis in Mexico, and earthquakes in Afghanistan, Nepal and the Philippines.

## **E. Publications**

79. As part of its activities, UN-SPIDER contributed to the elaboration of a flagship publication on the topic of multi-hazard early warning systems and elaborated another publication on space technologies for early warning systems:

(a) As a contribution to the implementation of the Plan of Action for Implementation of the Sendai Framework for Disaster Risk Reduction 2015–2030, and in its role as one of the two Co-Chairs of the International Network for Multi-Hazard Early Warning Systems (IN-MHEWS), UN-SPIDER actively contributed to the elaboration of a UNDRR publication entitled “Words into action”. The publication was officially presented during the high-level meeting on the midterm review of the Sendai Framework held in New York and will be officially launched at the beginning of 2024;

(b) As a contribution to IN-MHEWS and the Global Partnership using Space-based Technology Applications for Disaster Risk Reduction, UN-SPIDER worked on a specific publication with examples of the use of space technologies, products and services in a variety of early warning systems. The publication provides examples of such uses in the case of hydrometeorological, geological, environmental, extraterrestrial, coastal, biological and health hazards. The publication will be launched in the spring of 2024.

## **III. Voluntary contributions**

80. In its resolution 76/76, the General Assembly once again encouraged Member States to provide UN-SPIDER, on a voluntary basis, with the additional resources necessary – in addition to the small United Nations regular budget allocation – to address the increasing demand for support successfully and in a timely manner. Since its establishment, the programme has benefited from voluntary contributions (cash and in-kind) from the following Governments: Austria, China, Croatia, Czechia, France, Germany, Indonesia, Mexico, Republic of Korea, Spain, Switzerland and Türkiye.

81. The successful implementation of activities in 2023 benefited from the support and voluntary contributions received from the following Governments and entities:

(a) The Government of China, through its Ministry for Emergency Management, contributed over \$500,000 and extended the validity of previously contributed funds in order to continue to support the activities of the UN-SPIDER

office in Beijing for 2023. In addition, the Government of China offered the services of two national experts on loan from national government entities, based in the Beijing office;

(b) The University of Bonn contributed €101,474 towards the implementation of activities by the UN-SPIDER office in Bonn between June 2021 and June 2022. The University provided the same amount for activities conducted between June 2022 and June 2023. Within the scope of this cooperation agreement with the University of Bonn, the UN-SPIDER office in Bonn carried out an institutional strengthening mission to South Africa, organized several events and training courses in Bonn, Germany, provided advisory support to additional countries in Africa and managed the routine operation of the UN-SPIDER knowledge portal;

(c) The Government of Germany contributed the services of an associate expert as a junior professional officer.

82. In-kind contributions made by members of the network of regional support offices have been acknowledged in the present report.

## IV. Conclusions

83. UN-SPIDER is systematically working to achieve its mission by being a gateway to space information for disaster management support, serving as a bridge between the disaster management, risk management and space communities and being a facilitator of capacity-building and institutional strengthening, in particular for low- and middle-income countries.

84. Throughout the year, the UN-SPIDER team continued to reach out to and work together with other expert bodies and entities to facilitate knowledge-sharing and access to data, as well as to develop new cooperative ideas in the delivery of its mandates. The team participated in the disaster-related work of the Committee of Experts on Global Geospatial Information Management, in the work of the relevant working groups of the Committee on Earth Observation Satellites and in the efforts of the Group on Earth Observations, and cooperated or liaised with private sector entities on both the data collection and provision front (Maxar Technologies, Airbus Defence and Space, Planet Labs, ICEYE, BlackSky Technology, Satellite Vu, various China-based satellite imaging companies and others) and the data processing and analysis front (Esri, Google and others). Efforts are ongoing and will continue into 2024 to mobilize the additional resources needed through collaborative partnerships.