



8th Annual Coordination Meeting of the Regional Support Offices (RSOs) of the United Nations Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER)



6–8 June 2017, Vienna, Austria



1. Background

Through its resolution 61/110, the General Assembly of the United Nations established the United Nations Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER) as a programme of the United Nations Office for Outer Space Affairs (UNOOSA). The mandate of the programme is to provide universal access to all countries and all relevant international and regional organizations to all types of space-based information and services relevant to disaster management to support the full disaster management cycle. UN-SPIDER is implemented by UNOOSA and is headquartered in Vienna, with offices in Bonn and Beijing.

The General Assembly agreed that UN-SPIDER should work closely with regional and national centres of expertise in the use of space technology in disaster management, to form a network of regional support offices for implementing the activities of the programme in their respective regions in a coordinated manner, and to take advantage of the important experience and capabilities being offered, and to be offered by States Members of the United Nations, particularly by developing countries.

The UN-SPIDER programme currently has 21 Regional Support Offices (RSOs) spread over different regions. These RSOs are engaged in supporting activities of UN-SPIDER such as technical advisory support, rapid mapping during emergency response, preparing specific publications and contents for the Knowledge Portal, as well as contributing to workshops and conferences. RSOs are also involved in supporting regional initiatives of UN-SPIDER such as the “Strengthening Early Warning Systems for Droughts” (SEWS-D) and the “Earth Observation-based Information Products for Drought Risk Reduction at the National Level” (EVIDENz) projects, and the development of the procedural guidelines and Standard Operating Procedures (SOPs) for acquisition and utilisation of space-based information in disaster risk reduction efforts as well as during emergency response.

The 8th Annual Meeting of UN-SPIDER Regional Support Offices was conducted from 6 to 8 June 2017, in parallel to the 60th session of the Committee on the Peaceful Uses of Outer Space (COPUOS). The agenda for the annual meeting can be found in Annex 1. Focal points from ten RSOs attended the meeting, as well as representatives from other partner institutions. Annex 2 contains the list of participants.

The meeting aimed to compile additional contributions from the RSOs to the draft 2030 Roadmap for UN-SPIDER, which will then be submitted to UNOOSA senior management for approval, and to formulate inputs to the UNISPACE+50 process, specifically related to its thematic priority 6, “International Cooperation Towards Low-emission and Resilient Societies”. Participants also formulated concrete proposals for joint activities between the RSOs and UN-SPIDER taking into consideration the projects that were discussed during the UN-SPIDER+10 conference in 2016. A further focus was placed on fostering inter-RSO cooperation through specific collaborations and programmes.

This report provides a summary of presentations, discussions and recommendations on follow-up activities.

2. Opening (Tuesday, 6 June 2017, 10:00-11:00)

The meeting was opened by the Director of UNOOSA, Ms Simonetta Di Pippo. She reminded participants that UN-SPIDER is working to achieve its mission by being a gateway to space information for disaster management, by serving as a bridge between the disaster management, risk management and space communities, and by being a facilitator of capacity-building and institutional strengthening, particularly for developing countries.

The Director took the opportunity to provide an overview of the UNISPACE+50 process and highlighted that a special segment of the 61st session of COPUOS in June 2018 will mark the fiftieth



anniversary of the first United Nations Conference on the Exploration and Peaceful Uses of Outer Space.

The Director also pointed out that UN-SPIDER's working methods and collaborative approach, illustrated by the RSO network, was of interest in the context of UNISPACE+50 and could serve as a model when addressing other topics.

UNISPACE+50 is a process geared to develop a long-term vision for space governance taking into account the evolving and complex space agenda; and engaging all key stakeholders in the space arena, including governmental and non-governmental actors, commercial sector, civil society, young generation and public at large. The process, which will culminate in June 2018, is built around seven thematic priorities, and four pillars: space economy, space society, space accessibility and space diplomacy.

The two most relevant thematic priorities for UN-SPIDER are thematic priority 6 entitled "International Cooperation Towards Low-emission and Resilient Societies", and thematic priority 7, entitled "Capacity Building for the 21st Century".

Thematic priority 6 has been defined with the following objectives:

- To define synergies between climate change mitigation efforts, disaster risk reduction and global development and reducing emissions by replacing carbon energy with renewable energy;
- to develop a roadmap for enhanced resiliency of space-based systems and the affiliation of existing and future Earth observation, global navigation satellite system and telecommunication constellations for disaster risk reduction and climate change monitoring and mitigation;
- to improve integrated space applications approaches and the interoperability of space-based systems and ground/in situ systems;
- to provide requirements to new developers for coverage in geographical areas not sufficiently monitored or applications that need further development; and
- to identify governance and cooperation mechanisms to support this objective.

The efforts envisaged under thematic priority 6 are in line with the UN-SPIDER+10 recommendations and will include the elaboration of a strategy for its implementation. UNOOSA has been tasked by COPUOS to develop roadmaps for this thematic priority as well as for thematic priority 7.

Two conferences and a regional expert meeting will be organized in 2017 under this thematic priority:

- United Nations/Germany International Conference on "International Cooperation Towards Low-emission and Resilient Societies", to be conducted from 22 to 24 November 2017 in Bonn, Germany.
- United Nations International Conference on Space-based Technologies for Disaster Risk Reduction - "Building Resilience Through Integrated Applications", to be conducted from 23 to 25 October 2017 in Beijing, China.
- United Nations Office for Outer Space Affairs/Mexican Space Agency Regional Expert Meeting "Enhancing the Use of Space-based Information in Multi-Hazard Early Warning Systems", to be conducted from 11 to 13 July 2017 in Mexico City, Mexico.

UN-SPIDER staff provided an update on current UN-SPIDER activities, including Technical Advisory Missions (TAMs), regional expert meetings, international conferences, the Knowledge Portal, and general outreach activities. UN-SPIDER contributes actively to the implementation of the Sendai Framework, for instance by launching the Global Partnership Using Space-based Technology Applications for Disaster Risk Reduction (GP-STAR), the International Network on Multi-Hazard Early Warning Systems (IN-MHEWS) and adjusting TAMs to address Sendai Framework implementation.



**3. How can UN-SPIDER and RSO network contribute to thematic priority 6?
(World Café, Tuesday, 6 June 2017, 11:15–12:30 and 14:00–15:00)**

Taking into consideration the aim of thematic priority 6 to address the Sendai Framework, the Paris Agreement and the Sustainable Development Goals (SDGs), RSOs were requested to carry out an open discussion in the form of three small groups on (i) disaster risk reduction, (ii) climate change and (iii) the SDGs. Each group was tasked to discuss challenges, envisaged achievements and potential RSO contributions.

Observations made by participants touched upon several areas and highlighted the relevance of many items for all three agendas. They are presented in detail in Annex 3 and more concisely along with other comments made during the meeting as part of the recommendations listed below.

4. Update on the Global Partnership Using Space-based Technology Applications for Disaster Risk Reduction (GP-STAR) and other networks (Tuesday, 6 June 2017, 15:00–15:30)

Updates were provided on the International Working Group on Satellite-based Emergency Mapping (IWG-SEM), the International Network for Multi-Hazard Early Warning Systems (IN-MHEWS) and on the Global Partnership Using Space-based Technology Applications for Disaster Risk Reduction (GP-STAR).

IWG-SEM aims to better coordinate mapping efforts after disasters and improve data sharing tasking. It was created after the events in Haiti in 2010, when an estimated 90% of maps were not used. The network has developed emergency mapping guidelines, which are available online. It is currently working on a chapter on earthquakes and is open to suggestions. Criteria for becoming a member of the network can be retrieved online.

IN-MHEWS was proposed by a number of UN organizations, including UNOOSA, at the Third World Conference on Disaster Risk Reduction (WCDDR) as a joint effort to assist and advise States and organizations in sustaining and improving their multi-hazard early warning services. The network aims to facilitate the sharing of good practices, make available policy-relevant guidance, promote synergies and partnerships among stakeholders, and advocate for the importance of MHEWS. At the Multi-Hazard Early Warning Conference organized in May 2017 in Cancun, Mexico; over 400 participants from around 90 countries discussed strategies and actions to promote MHEWS. Among other activities, the network currently works on updating a checklist for Developing Early Warning Systems and launched a consultation on measuring early warning access and effectiveness with the aim of identifying a set of metrics to provide guidance on how the effectiveness of, and access to, early warning systems can be measured; encompassing a conceptual framework of key elements, including sources of data, information and methodologies.

GP-STAR was also launched during the Third UN World Conference on Disaster Risk Reduction (WCDDR) in March 2015 in Sendai with the aim of facilitating the use of Earth observation as well as satellite-based technology and applications, through a variety of efforts including the provision of technical advisory support for application in the context of the Sendai Framework for Disaster Risk Reduction 2015-2030 (Sendai Framework). As a first point of action, the network conducted a baseline study to identify methods and initiatives that already exist in this area. The study is available as a publication which consists of a number of examples of space applications that support the implementation of the Sendai Framework. GP-STAR organized a side-event at the latest session of the Global Platform in Cancun and has seen the number of organisations interested in joining the Partnership increase.



**5. Update and feedback discussion on the draft UN-SPIDER Roadmap 2030
(Tuesday, 6 June 2017, 16:00–17:30)**

Participants were invited to provide input on the draft UN-SPIDER Roadmap 2030, which was circulated before the meeting and was presented to initiate the discussion. The draft roadmap aims to align UN-SPIDER activities with the Space2030 agenda.

During the discussion of the draft roadmap, participants suggested that it would be important to underline the added value of UN-SPIDER and of the work elements suggested in the document, and to include some additional information on the overall objectives of the programme. Also, the draft roadmap's work elements could be linked more explicitly to the recommendations formulated at the UN-SPIDER+10 meeting in 2016. In addition, the draft roadmap would benefit from an overall vision and a list of indicators against which progress would be measured.

Suggestions for modifications to the text will be reflected in a revised version of the draft roadmap to be shared with RSOs in due course.

**6. Which activities and projects can be implemented towards 2020?
(Wednesday, 7 June 2017, 14:00–17:30)**

The session followed the structure of the SPIDER+10 recommendations and was used to discuss recommendations and those projects that were proposed during the UN-SPIDER+10 conference. The opportunity was used to discuss additional tasks to be conducted by the RSOs in their regions, as well as global efforts. Table 1 summarises these tasks and activities to be conducted under such tasks. Participants also underlined that projects should address stakeholders' needs and obligations stemming from international conventions and frameworks such as the 2015 Sendai Framework priorities or the 2016 Windhoek Declaration for Enhancing Resilience to Drought in Africa.

Table 1: Suggested tasks and related activities proposed by RSOs

Task	Potential activities	Lead RSO
Set of activities to be conducted in the Caribbean	<ul style="list-style-type: none"> • Conduct training workshops and develop online training. Imagery for such training workshops could be obtained through MoU with Digital Globe and/or CDEMA agreement • Support relevant agencies in becoming Authorized Users of the Charter Space & Major Disasters and support establishing a dialogue between Charter project manager and the relevant agencies in the event of an activation • Conduct a Regional Expert Meeting to initiate the two points above 	University of the West Indies
Identify fundraising opportunities	<ul style="list-style-type: none"> • RSOs to share information about relevant project calls • UN-SPIDER to make available a list of donors compiled in the past • UN-SPIDER to shortlist recommendations from the SPIDER+10 outcome document that applies to several countries • Coordinate on fundraising proposals • Donor countries encourage coordination among UN agencies 	Mexican Space Agency



Internal UN meeting to reach out and identify synergies with other agencies (One UN)	<ul style="list-style-type: none"> In line with the One UN idea, organize a meeting in Vienna and invite agencies such as the United Nations Environment Programme (UNEP) to identify how UN-SPIDER and its RSOs could contribute to projects 	UN-SPIDER Vienna office
Meeting with Norwegian Ministry of Foreign Affairs	<ul style="list-style-type: none"> Organize a meeting with the Norwegian Ministry of Foreign Affairs to investigate funding opportunities for projects to address end-user requirements 	GRID-Arendal
Recommended Practice on Sand and Desert Storm Monitoring	<ul style="list-style-type: none"> Develop a Recommended Practice on Sand and Desert Storms Reach out to the United Nations Convention to Combat Desertification (UNCCD) as they have shown interest in the topic 	Iranian Space Agency
Academic projects	<ul style="list-style-type: none"> Academic RSOs, for instance the Center for Remote Sensing of Land Surfaces (ZFL), can host and finance MA and/or PhD students, and can also support applications for funding from the EU The United Nations University (UNU, Bonn) is also eligible for EU funding Some of the potential projects identified in the context of the SPIDER+10 could be turned into research projects Engage students 	Center for Remote Sensing of Land Surfaces (ZFL), University of Bonn
Update UN-SPIDER booklet	<ul style="list-style-type: none"> If needed, update UN-SPIDER booklet prior to special segment on UNISPACE+50 during COPUOS in June 2018 to showcase UN-SPIDER achievements 	UN-SPIDER
Project Table	<ul style="list-style-type: none"> List current RSO projects and partner them to the priorities under the draft UN-SPIDER roadmap Develop a template to facilitate input 	All RSOs
Regular virtual RSO meeting	<ul style="list-style-type: none"> Set up regular video conferences for RSOs and UN-SPIDER to coordinate efforts 	All RSOs
RSO strengths list	<ul style="list-style-type: none"> Create a table listing RSO strengths for other RSOs and UN-SPIDER to be able to identify and draw upon specific expertise where needed 	All RSOs
Recommended Practices on flood hazard mapping	<ul style="list-style-type: none"> Draft Recommended Practice on flood hazard mapping 	Pakistan Space and Upper Atmosphere Research Commission (SUPARCO)
Recommended Practices on NDVI forecast	<ul style="list-style-type: none"> Draft Recommended Practice on the Normalized Difference Vegetation Index (NDVI) forecasting 	SUPARCO
Booklet on lessons learnt	<ul style="list-style-type: none"> Using space-based information to monitor Volcanic eruption 	National Institute of Aeronautics and Space (LAPAN)
Knowledge Portal support	<ul style="list-style-type: none"> RSOs familiar with Drupal to share experiences and best practices in order to support the development of the UN-SPIDER Knowledge Portal 	All RSOs



Knowledge Portal content	<ul style="list-style-type: none"> Regularly provide content (news, publications, applications) to be uploaded into the Knowledge Portal and featured in the Monthly Update and Newsletter 	All RSOs
Fundraising proposal to EU	<ul style="list-style-type: none"> Re-submit joint fundraising proposal to the EU 	Romanian Space Agency (ROSA)

**7. How can RSOs inter-agency cooperation be strengthened?
(Thursday, 8 June 2017, 9:30–11:00)**

During the session, RSOs presented their current and upcoming activities that would support the UN-SPIDER programme.

The Hungarian RSO based at Eszterházy Károly University provided participants with an overview of recent organizational changes at the university and elaborated on current projects the RSO is undertaking.

The International Centre for Integrated Mountain Development (ICIMOD) became an RSO around five years ago. It has carried out a number of joint activities since then, such as six trainings spread across ICIMOD member states and a Technical Assistance Mission in Bhutan two years ago. Upcoming joint activities with UN-SPIDER include a Technical Advisory Mission to Nepal this year and a rapid mapping simulation in Myanmar next year. ICIMOD's strength lies in analyzing landslide hazards and risk mapping. They are mainly interested in mountain landscapes and also deal with glacial lake outburst floods. ICIMOD leads rapid response mapping when there is a disaster, for instance in the case of the 2015 earthquake in Nepal.

The Centre for Remote Sensing of Land Surfaces (ZFL), UN-SPIDER's German RSO, brings together researchers from a number of University of Bonn departments and other institutions involved with ZFL. The RSO's expertise is quite comprehensive and includes early warning systems, radar image analysis, and geospatial modelling and data fusion. It also has a strong expertise in the Copernicus programme. ZFL is part of the Earth Observation-based Information Products for Drought Risk Reduction on the National Level (EVIDENz) project in collaboration with the United Nations University Institute for Environment and Human Security (UNU-EHS) and UN-SPIDER. It can support UN-SPIDER through short-term expertise and experts, student projects as well as Master and PhD thesis projects, and would be open to conduct research projects with other RSOs, for which joint RSO applications could be submitted. The Centre works closely with other UN entities and could also connect other RSOs to the same.

The Iranian Space Agency presented their activities since the last RSO meeting, which included the organization and conduction of a United Nations/Islamic Republic of Iran Workshop on the Use of Space Technology for Dust Storm and Drought Monitoring in the Middle East Region in November 2016 in Teheran. In the last six months, the RSO has developed several public services which are distributed through the following website: www.rs.isa.ir. It also acts as a receiving station for MODIS, elaborates products which are then distributed through its website; and creates weekly mosaics based on the data. Besides a dust storm monitoring system, the Iranian Space Agency also maintains a National spectral library. It has activated the Charter and acted as project manager and value added producer. The RSO highlighted that fire mapping and dust storm monitoring could be useful for neighbouring countries as well. The RSO offered to translate the resources into English.

The University of the West Indies presented their current activities on damage assessment to facilitate rapid compensation. It underlined the relevance of Recommended Practices on drought,



flood and exposure mapping, the latter being particularly relevant before hurricanes. The RSO expressed interest in teaming up with the German RSO on PhD projects.

UN-SPIDER's Indonesian RSO, the National Institute of Aeronautics and Space (Lapan), joined the network in 2013. It has conducted a number of workshops since and was also involved in emergency response efforts. The RSO has published a booklet about the UN-SPIDER Knowledge Portal. It is currently involved in efforts related to smoke haze monitoring in Indonesia.

The Mexican Space Agency is supporting the Strengthening Early Warning Systems for Drought (SEWS-D) project and currently serves as the chair for the Global Partnership Using Space-based Technology Applications for Disaster Risk Reduction (GP-STAR). In addition, it is supporting the UN-SPIDER Regional Expert Meeting in Mexico in July 2017.

Nigeria's National Space Research & Development Agency (NASRDA) is working on reactivating a memorandum of understanding with the Economic Commission for West African States (ECOWAS). Its activity on capacity development on Disaster Resilience Leadership (DRL) includes participating in a workshop focused on basic methodologies in hazard and risk assessment, funded by the Bill and Melinda Gates Foundation. As part of the Land Degradation Neutrality Target Setting Programme, supported by the Global Support Programme through UNCCD, NASRDA developed a methodology for assessments for land degradation in Nigeria. In addition, the RSO is implementing a project with a focus on the assessment of environmental sensitivity to desertification in a Northern Nigeria state of Katsina. The goal is to identify areas that are prone to desertification so that early warnings efforts, as well as adequate government policy, can be developed. Finally, the RSO is currently involved in the preparation and policy document developments for the UNREDD+ programme in Nigeria, which has led to the development of the UNREDD+ strategy document for Nigeria.

UN-SPIDER's Pakistan RSO, the Pakistan Space and Upper Atmosphere Research Commission (SUPARCO), presented its efforts on disaster monitoring. Its "DisasterWatch" platform is the focal point for all national and regional stakeholders in the field of disaster management. The portal contains updated analysis and spatial information extracted from various satellite-based datasets and technologies. In 2016, SUPARCO set up a joint task force for crop monitoring. It has also participated in UN-SPIDER Beijing workshops. The organization has expertise in flood model trainings, which it would be ready to make available in the UN-SPIDER context.

The Asian Disaster Preparedness Center (ADPC), whilst not present at the meeting, provided an overview of its current activities as a SERVIR node. Current products ADPC is developing in this context include a virtual rain and stream gauge data service, a surface water mapping tool, a regional drought monitoring system, which explores and integrates drought monitoring and forecasting information, and a regional land cover monitoring system. The RSO is open for proposals for collaboration on a number of projects in the region, including supporting landslide early warning systems in Myanmar and improving rainfall estimates for flood forecasting in Cambodia.

Comments from other partner institutions attending the meeting

JAXA commented on its contribution to the UNESCO Pakistan flood project, which is funded by the Government of Japan and is implemented by UNESCO. Partner agencies include the Pakistan Space and Upper Atmosphere Research Commission (SUPARCO), a UN-SPIDER RSO. The project's main activities are the development of an early warning system using ICHARM's Integrated Flood Analysis System (IFAS) and capacity building in Pakistan to manage the floods. The project also includes capacity-building and public awareness raising efforts on flood management so that flood hazard information and tools are used appropriately. Under the project, JAXA is responsible for hazard mapping and also provides free and open satellite data. A workshop based on this project will be organized in 2018; other RSOs are welcome to attend and also contribute to this project.

The German Aerospace Centre (DLR) drew the attention of participants to two events planned together with UNOOSA/UN-SPIDER in 2018: the DLR Conference on Climate Change 2018 that will



take place from 17 to 19 April 2018 in Cologne and a High Level Forum (HLF) planned for the end of November 2018.

GRID-Arendal supports the United Nations Environment Programme's (UNEP) information and outreach efforts by communicating information about the environment to decision makers. It works on a number of topics such as environmental crime. Under its State of the Environment and Spatial Planning programme, the centre translates environmental information into visual products. It also works on a project with UNOOSA to combat illegal fisheries in small island states.

Discussion

Participants suggested to engage students from universities, also remotely, to generate content for the UN-SPIDER Knowledge Portal. RSOs were encouraged to continue participating in TAMs and other events which would allow promoting the relevance of space-based information in disaster risk management and emergency response.

In order to foster cooperation among RSOs, participants agreed that it would be useful to have regular coordination meetings via video- or teleconferencing between the annual in-person RSO meetings, in order to coordinate and advance on the projects proposed. Agendas for the coordination meetings should be shared in advance so that RSOs can ensure the relevant interlocutor joins the call from their side. More generally, for planning purposes, the RSO would require knowing, in advance; a bit more about activities they are expected to conduct in their capacity as RSOs so that these can be included in their institution's work plan.

Joint RSO activities, as organized in the past by the International Water Management Institute (IWMI) and NASRDA on the topic of floods, are encouraged, and NASRDA expressed interest in teaming up with ZFL on the topic of droughts.

To raise awareness about what services and resources RSOs can offer, it was suggested that a compilation of catalogue of services could be shared with countries. The services would also be promoted in the Knowledge Portal and during TAMs.

A proven approach from Central and Latin America, which RSOs could support and replicate, are inter-institutional groups that are trained in remote-sensing. These groups consist of different government agencies and contribute to strengthening the capacity of the country in question; to generate information to be used in the decision-making process through a multisectoral and inter-institutional approach, and to increase the use of information generated by government agencies by turning it into a geo-spatial format.

8. UN-SPIDER Knowledge Portal (Thursday, 8 June 2017, 11:30–13:00)

The presentation on the UN-SPIDER Knowledge Portal reminded participants of the services and content offered through the Portal and provided a detailed overview of the user statistics, which are compiled regularly.

The most important challenge faced by the Portal is that it seeks to appeal to all types of audiences - decision-makers, practitioners and students from the space, disaster risk management and emergency response communities. In order to be relevant to all these groups, content needs to be added and updated regularly. This content should ideally also be made available in French and Spanish; while parts of the Portal, including some Recommended Practices, have already been translated into these languages, there are still pages left to translate.

The Knowledge Portal is promoted during Technical Advisory Missions in order to encourage states to use the information available. In order to strengthen institutions and build capacities, training on the Recommended Practices featured on the Portal are also conducted during TAMs, and its



collaboration with staff in disaster risk management and emergency response organizations is sought after, in order to enhance the use of the Portal and of the Recommended Practices.

RSOs were encouraged to provide content for the Portal, including news about their activities, and agreed to provide additional Recommended Practices, for instance, on flood hazard mapping and landslides. Envisaged RSO contributions to the Portal are listed in the project overview attached below.

9. Impact of UN-SPIDER activities (Thursday, 8 June 2017, 14:00–15:30)

The external evaluation of UN-SPIDER's Beijing office realised in 2017, including its methodology, was presented briefly. Overall, demand for UN-SPIDER assistance persists: while the number of new TAMs has decreased, the number of follow-up missions to TAMs has increased. The case study of Myanmar, where the first TAM took place in 2012 and which has developed strong capacities since then, besides setting up dedicated organizations such as a Disaster Management Training institute, was presented as one of the many success stories. Other cases presented were Vietnam, Sri Lanka and Bangladesh. Similar success stories exist in the Caribbean and Latin America, where UN-SPIDER is dedicating efforts with national civil protection agencies to establish inter-institutional group and engaging such national civil protection agencies as authorized users of the International Charter Space & Major Disasters. RSOs have played a crucial role in many of these missions, including in Africa, where they've helped organize TAMs. In the case of the latter, UN-SPIDER also coordinated with the Committee on Earth Observation Satellites (CEOS).

As part of the United Nations Secretariat, UNOOSA maintains indicators to track progress. In the past, one indicator was the number of countries the Office had provided assistance to; after a review, the indicators have now been fine-tuned and include the number of services provided by the UN-SPIDER Knowledge Portal. Participants agreed that it would be relevant to create a compendium with UN-SPIDER success stories and showcase success stories in the context of next year's UNISPACE+50 events.

10. Recommendations and way forward

The following section synthesizes recommendations for UN-SPIDER made by participants across all sessions. Recommendations are categorized as general or as addressing UNISPACE+50 thematic priorities 6 or 7.

General recommendations

➤ Facilitate timely access to quality data

Participants emphasized the importance of data access, quality and use. While a significant amount of data is usually available in the case of a major disaster, its availability is limited in the case of smaller disasters or in the case of selected types of disasters. Participants pointed out that legal provisions to ensure access and availability to space-based data would be conducive to incorporating the latter in disaster risk management efforts. Standard Operating Procedures (SOPs) would then be required to use the data adequately and build services. Crowd-sourced information, while potentially relevant, would require verification before being used. RSOs could help facilitate access to existing datasets and services such as Copernicus, and also combine datasets where appropriate. Timeliness of access to data continues to be a concern and participants underlined the importance of near-real-time satellite data in many cases.



➤ **Strengthen RSO network collaboration and exchange of information**

Participants suggested strengthening collaboration among RSOs by exchanging information more frequently and exchanging information about strengths and activities of the RSOs more systematically.

➤ **Support organizations in making use of the Charter by assisting them in becoming Authorized Users and by training them to act as projects managers for activations**

A further activity that was mentioned was the possibility of training organisations in acting as project managers for activations of the International Charter Space & Major Disasters. Such trainings have been hosted by UNOOSA in the past, but UN-SPIDER could be given the role of trainer by the Charter's secretariat. UN-SPIDER has also supported countries in becoming authorised users of the Charter. However, trainings related to the Charter need to be organized separately and cannot form part of TAMs.

➤ **Draw upon the RSO network for fundraising efforts**

Participants discussed opportunities to support UNOOSA/UN-SPIDER fundraising efforts by connecting the Office to consortia implementing relevant projects in their respective regions. UN-SPIDER has operated with the same budget since its creation and additional funding would be welcomed in order to be able to implement envisaged activities adequately. RSOs could support UN-SPIDER by putting forward fundraising proposals which would include UN-SPIDER-related activities.

➤ **Ensure that activities envisaged under the draft roadmap are aligned with capacities**

Some participants voiced concerns that the draft roadmap in its present form is quite ambitious given UN-SPIDER's limited resources, and it was agreed to include in the draft roadmap issues related to the funding of the programme and potential fundraising activities be conducted by UN-SPIDER and RSOs.

Thematic priority 6

➤ **Continue raising awareness about the added value of space-based information, especially at the local level, and emphasize its relevance for the implementation of the Sendai Framework, Paris Agreement and Sustainable Development Goals (SDGs)**

Participants made clear that raising awareness about the relevance of space-based information and satellite technologies in general among decision-makers and the general public alike is a challenge for all three agendas discussed. RSOs were encouraged to make use of their access to decision-makers at the regional, national and local levels; to highlight the added value of space-based information. Clear links between the use of space-based information and the implementation of the three agendas support increasing the relevance of the former in the eyes of stakeholders, as witnessed in the content of UN-SPIDER Technical Advisory Missions where recommendations were relevant to the implementation of the Sendai Framework. Existing content and services on the UN-SPIDER Knowledge Portal could also be publicised more, including at events such as World Space Week.

➤ **Encourage research and development of specific space applications and services integrating space-based and in situ data and supporting the disaster risk reduction, climate change and sustainable development agendas**

Participants pointed out that research on the use of space technologies in the context of disaster risk reduction (DRR), climate change and sustainable development agendas is limited and not always adapted to local circumstances and needs. As a result, research targeted towards, for instance, using space technologies for DRR efforts, should be encouraged. Regarding systems and services,



participants highlighted that integrating space-based data with in-situ data, in order to validate the calibration of satellites with the latter, would support the implementation of the three agendas. Sustainability, cost-efficiency and appropriate constellations of satellites were underlined as challenges. By contributing to programmes such as KiboCUBE, RSOs could deploy their own nanosatellites and CubeSats with the objective of obtaining relevant data.

It was also suggested that, given UN-SPIDER's unique role as a bridge between the space and disaster management communities, small UN-SPIDER satellites could be designed for specific disaster types which reflect on relevant constellations of nanosatellites.

➤ **Raise awareness about benefits of space-based information among and coordinate capacity building efforts with other UN entities**

Participants suggested that, in the context of TAMs, UN-SPIDER reaches out to UN Resident Coordinators and other UN agencies, some of which are implementing projects that UN-SPIDER activities would be relevant to. In the past, when UN-SPIDER recommendations were shared with other UN agencies upon the request of the country in question, funding for follow-up activities based on the recommendations was more readily available. However, this applies to country offices of the respective agencies rather than to their headquarters, and additional efforts should be undertaken to convince the latter of the relevance of space-based information. Coordination should also be sought after when it comes to delivering training in Member States, in order to avoid duplication of efforts.

➤ **Develop additional services**

Participants stated their preference for UN-SPIDER to become more service-oriented by, for instance, developing and facilitating access to online tools that would provide access to data and combine datasets in order to identify vulnerabilities of the population.

➤ **Investigate connecting UN-SPIDER to other initiatives on related issues**

In addition, it was mentioned that there are a number of opportunities to access additional funds by linking UN-SPIDER's activities to other initiatives and issues, such as the Space for Development Profile and its Space Solutions Compendium (UNOOSA project), health-related applications during disasters, space weather and satellite-based internet connectivity.

Thematic priority 7

➤ **Build users' capacity to access and make use of latest space technologies and space-based information for disaster management**

Participants highlighted that capacity building efforts would need to include training to support users in making use of the latest space technologies. This could be delivered through capacity building centres in different languages, drawing also upon the Regional Centres for Space Science and Technology Education affiliated to the United Nations, some of which have the capacities to develop resources, including Massive Open Online Courses (MOOC), although participants suggested that the format should be reviewed as a simple online course might be more appropriate.

It was suggested that some RSOs that are academic institutions might also be able to support such efforts by developing operational methodologies to guide users in using space-based information. These methodologies could potentially be tested by other RSOs before being incorporated into capacity building efforts.

Online courses and a list of solutions along the lines of the Space Solutions Compendium envisaged by UNOOSA under UNISPACE+50 thematic priority 7 represent further resources that could be



created to support capacity building, with a focus on reaching and adapting to the needs of civil protection agencies and other end-users at local level. In addition, participants also highlighted that countries would benefit from legal capacity building as part of TAMs that would allow them to develop a legal support system to access space technologies and space-based information.



Annex 1 - Agenda

Tuesday, 6 June 2017

Time	Topic	Moderator and comments
- 10:00	Arrival and registration of participants	
10:00 – 11:00	<p>Opening</p> <ul style="list-style-type: none"> - Welcome Remarks by <i>Simonetta Di Pippo Director, UNOOSA</i> - Context and purpose of meeting by <i>Luc St-Pierre, Chief, Space Application Section, UNOOSA</i> <p>Tour de table Where is UN-SPIDER now – UNISPACE+50 and thematic priority 6 (International cooperation towards low-emission and resilient societies) by <i>Shirish Ravan, UN-SPIDER</i></p>	Shirish Ravan
11:00 – 11:15	Break	
11:15 – 12:30	<p><u>How can UN-SPIDER and RSO network contribute to thematic priority 6? 1/2</u></p> <p>WORLD CAFÉ on (i) Challenges – needs, (ii) vision/what to achieve (iii) what to contribute to. Done in three parallel thematic groups:</p> <ul style="list-style-type: none"> • Disaster Risk Reduction – Stefan Kienberger, UN-SPIDER • Climate Change – Joachim Post, UN-SPIDER • Sustainable Development Goals – Lorant Czarán, UN-SPIDER 	Stefan Kienberger
12:30 – 14:00	Lunch	
14:00 – 15:00	<p><u>How can UN-SPIDER and RSO network contribute to thematic priority 6? 2/2</u></p> <p>PLENARY – Clustering and consolidation of group work and development of concrete proposals for TP6 of UNISPACE+50</p>	Luc St-Pierre & Stefan Kienberger
15:00 - 15:30	<p><u>Update on the Global Partnership on Space Technology Applications for Disaster Risk Reduction (GP-STAR) and other networks</u></p>	Joachim Post
15:30 – 16:00	Break	
16:00 – 17:30	<p><u>Update and feedback discussion on draft UN-SPIDER Roadmap 2030</u></p> <p>Discussion will build on results achieved in discussion before and draft document on roadmap circulated prior to the meeting</p>	Shirish Ravan



Wednesday, 7 June 2017

Time	Topic	Moderator and comments
12:30 – 14:00	Lunch	
14:00 – 15:30	<u>Which activities and projects can be implemented towards 2020? 1/2</u> Recap on the project proposals developed during UN-SPIDER+10 Workshop in June 2016 OPEN SPACE with discussion and brainstorming in parallel groups on project proposals for its revision, update, modification and extensions based on RSO's interests	Lorant Czaran and Stefan Kienberger with RSO representatives
15:30 – 16:00	Break	
16:00 – 17:30	<u>Which activities and projects can be implemented towards 2020? 2/2</u> Continuation of OPEN SPACE and discussion Presentation and consolidation How can we put the proposals into action	Lorant Czaran and Stefan Kienberger with RSO representatives
19:00 -	Social Event	

Thursday, 8 June 2017

Time	Topic	Moderator and comments
9:30 – 11:00	<u>How can RSOs inter-agency cooperation be strengthened?</u> Lightning talks of each RSO (2 minutes maximum) on strengths of each RSO and its role in specific applications domains Discussion on the mechanism to keep inter-RSO cooperation active	Godstime James (NSRDA)
11:00 – 11:30	Break	
11:30 – 13:00	<u>UN-SPIDER Knowledge Portal</u> Review knowledge portal related recommendations of UN-SPIDER+10 Conference, challenges to move forward, thoughts and discussion on updating user interface, relevance to the end users, content management, RSOs contributions etc.	Juan Carlos Villagran & Joachim Post
13:00 – 14:00	Lunch	
14:00 – 15:30	<u>Impact of UN-SPIDER activities</u> Experience sharing, success stories, critical factors to achieve impact, funding efforts etc. <u>Summary (what has been achieved) – way ahead</u>	Shirish Ravan & Luc St-Pierre



Annex 2 – List of participants

Country	Last Name	First Name	Affiliation
Romania	Badea	Alexandru	Romanian Space Agency
Pakistan	Bhatti	M. Iffikihar	Pakistan Space and Upper Atmosphere Research Commission
Hungary	Bozo	Pal	Eszterhazy Karoly University
Mexico	Castillo Urdapilleta	Julio Cesar	Mexican Space Agency
Germany	Greve	Klaus	Centre for Remote Sensing of Land Surfaces, University of Bonn
Nepal	Gurung	Deo Raj	International Centre for Integrated Mountain Development
Nigeria	James	Godstime	National Space Research and Development Agency
Jamaica	Opadeyi	Jacob	University of the West Indies
Iran	Sadeghi Naeini	Ali	Iranian Space Agency
Indonesia	Syarif	Budhiman	Remote Sensing Application Center, National Institute of Aeronautics and Space
Austria	Hofer	Ludwig	Austrian Research Promotion Agency
Germany	Lechtenboerger	Christiane	German Aerospace Center
Japan	Miyohsi	Takanori	Japan Aerospace Exploration Agency
Norway	Yemelin	Valentin	GRID-Arendal
	Botez	Radu	United Nations Office for Outer Space Affairs
	Du	Hui	United Nations Office for Outer Space Affairs
	Kienberger	Stefan	United Nations Office for Outer Space Affairs
	Kojima	Ayami	United Nations Office for Outer Space Affairs
	Lorant	Czaran	United Nations Office for Outer Space Affairs
	Post	Joachim	United Nations Office for Outer Space Affairs
	Ravan	Shirish	United Nations Office for Outer Space Affairs
	St-Pierre	Luc	United Nations Office for Outer Space Affairs
	Sun	Jiayi	United Nations Office for Outer Space Affairs
	Tong	Tang	United Nations Office for Outer Space Affairs
	Villagran de Leon	Juan-Carlos	United Nations Office for Outer Space Affairs



Annex 3 – How can UN-SPIDER and RSO network contribute to thematic priority 6? Outcomes of the World Café session

Note: Challenges identified are displayed in white text, objectives to be achieved on a white background and potential RSO contributions on a grey background.

Area/Issue	Disaster Risk Reduction	Climate Change	Sustainable Development Goals	Action points for UN-SPIDER and RSOs
Capacity Building Efforts	Legal support system to access space-based technologies			Provide (legal) capacity building
	Training in order to support users in using new technologies, for instance through capacity building centres in different languages			
			Bring together different actors, including other UN agencies, in capacity building efforts.	Coordinate with international stakeholders
	RSOs which are academic institutions can provide operational methodologies, which can then be tested by other RSOs			Provide guidance on using space-based information
	Online courses and other resources, especially geared towards the end-user on a local level		Develop list of solutions / best practices for using space technologies for attaining the SDGs (Space Compendium)	
Data	During major disaster, data is usually available but there are few operational services to use the data. Standard Operating Procedures can provide guidance on providing services			Support development and access to services to make use of data available
	Formulate legal provisions to facilitate the accessibility to and availability of data. Ensure quality of services and products through control forms.	Provide open access to data and data product on, for instance, land-use mapping and change-mapping over time		Facilitate data access and sharing
		Facilitate access to existing relevant datasets and services such as those	Encourage data sharing among UN agencies	



Area/Issue	Disaster Risk Reduction	Climate Change	Sustainable Development Goals	Action points for UN-SPIDER and RSOs
		provided by Copernicus		
	Crowd-sourced information is often not considered by the government because it might include a bias. Validation of the crowd-sourced data is required for it to be credible.			Ensure data quality
		Acquire space-based data for elements related to the Paris Agreement	Identify indicators and data relevant to the country and include in Technical Assistance Missions	Support identifying topic-specific data
	Create combined datasets, for instance to develop a better understanding of vulnerabilities	Use space-based information for adaptation needs assessment	Monitor for crop (food security, water supply)	
	Make data and products available on time and reduce the gap between the event and data provision		Real-time satellite data for monitoring	Support timely access to data
	Access to data remains a challenges, especially during non-major disasters			
Awareness-raising and advocacy	Emergency response is given more attention than prevention and mitigation. More systematic reference to the Sendai Framework is required to draw more attention the latter two.		Address recommendations from Technical Assistance Missions that are relevant to SDGs.	Raise awareness about how space-based information supports implementation of the Sendai Framework, Paris Agreement and Sustainable Development Goals
	Raise awareness to decision makers about strengths and limitations of satellite technologies	Raise awareness among the general public and especially stakeholders about the using space-based information to monitor climate change	Map out at indicator level and develop a publication about how disaster management-related space-based information contributes to the implementation of the SDGs	



Area/Issue	Disaster Risk Reduction	Climate Change	Sustainable Development Goals	Action points for UN-SPIDER and RSOs
		<p>Advocate at the regional, national and local level for the relevance of space-based information. While UN-SPIDER can engage other international and regional organisations, the RSOs can bring in local decision-makers and end-users into events.</p>		
<p>Policy and legal frameworks</p>	<p>Review the national disaster risk management framework to focus on Disaster Risk Reduction</p>			<p>Support review of national disaster risk management framework</p>
<p>Technical Developments and Services</p>		<p>Validate satellite calibration with in-situ data</p>		<p>Provide guidance on space applications development</p>
	<p>Support the constellation of constellations program. For instance, RSOs could contribute to the cube satellite launch.</p>	<p>Appropriate constellation of satellites, calibration of satellites and application flow for monitoring the environment remains a challenge</p>	<p>Ensure sustainability and cost-efficiency of space-based applications</p>	
	<p>Develop information delivery services for DRR, which would include in-situ and spaces-based data</p>	<p>Develop services to detect waste on oceans</p>		<p>Support development of topic-specific services</p>
	<p>Encourage research targeted towards space-based innovation for DRR</p> <p>Adapt research results to local circumstances</p>			
<p>Fundraising</p>			<p>Support UNOOSA/UN-SPIDER in accessing funds, for instance by connecting to other consortia</p>	<p>Conduct joint fundraising activities</p>