



UN-SPIDER NEWSLETTER

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In focus

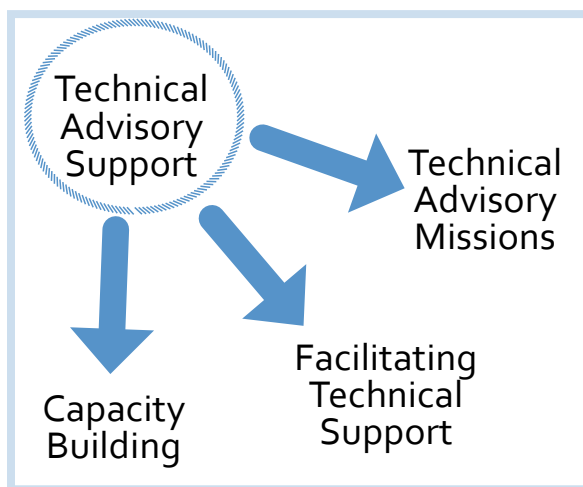
Bridging the gap: Technical Advisory Support and UN-SPIDER

When the Committee on Peaceful Uses of Outer Space (COPUOS) was contemplating the establishment of the UN-SPIDER Programme in 2006, it had a major imbalance in mind. On the one hand, space-based technologies are emerging fast and are quickly finding their way into everyday life – allowing us to observe changes on our planet, to communicate wherever we are or to tell us exactly where something or someone is located. On the other hand, disaster-risk management and emergency response communities, particularly in developing countries, are not yet fully taking advantage of the opportunities that space-based information offers: space-based technologies can greatly contribute to an improved risk assessment, early warning and mitigation of disasters.

So why the gap? Firstly, those in charge of both disaster-risk management or emergency response efforts in these countries may not yet recognize the usefulness of space-based information, as reflected in the lack of policies promoting the use of such information.

Additionally, practitioners might not be aware of where and how they can access space-derived data. Furthermore, even if disaster managers are aware of the advantages of satellite-technologies and know the existing mechanisms to access such data, they might not necessarily have the capacities to extract the data that could be useful to their specific situation and know how to use it. Finally, they might not have the necessary facilities, hardware and software to access and subsequently process the data.

Recognizing this imbalance, UN-SPIDER is aiming at bridging this gap. The goal is to ensure that all countries recognize the value of all types of space-based information to prevent, mitigate, and use them effectively when challenged with natural hazards and related humanitarian crises. This issue of the UN-SPIDER Newsletter gives a clear picture of how UN-SPIDER aims at fulfilling this goal through its Technical Advisory Support.



Technical Advisory Support (TAS) is one of the prime activities of the UN-SPIDER programme at the national level. It serves to identify the existing capacity to use space-based information, to analyze the institutional framework to support disaster management through space-based information and to identify the limitations that inhibit the use of such information. TAS attempts to enable Member States to overcome these limitations through international cooperation and regional opportunities, networking with regional institutions, and setting up disaster management plans. It covers region-specific aspects such as trans-boundary issues, emergency response, risk assessment, GIS-based disaster management systems, and disaster-risk reduction.

TAS efforts range from a simple consultative phone call to the facilitation of technical support, missions, trainings and workshops. To illustrate the various forms, that UN-SPIDER's support can take, this Newsletter showcases three types of UN-SPIDER's TAS: Technical Advisory Missions, Capacity Building and Facilitation of Technical Support. ■

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Technical Advisory Missions

Technical Advisory Missions (TAM) are an instrument that UN-SPIDER offers to identify the needs of Member States regarding their capacities to fully take advantage of space-based information. TAMs are officially requested by the respective national government and are conducted by a team of experts. The team meets with key disaster management and development authorities in the Government, United Nations organizations, regional and international organizations/initiatives and private entrepreneurs to discuss the topic in depth. It makes recommendations focusing on how to improve the access to and use of space-based information in risk and disaster management.

UN-SPIDER Technical Advisory Missions typically generate:

- Reports with recommendations and follow-up actions;
- Suggestions on guidelines/policies on disaster management issues, emphasizing the use of space-based information in all stages of disaster management;
- Facilitation for capacity building in collaboration with UN-SPIDER and partners;
- Partnerships for accessing existing emergency support mechanisms.

Typically, TAMs are five-day missions. The experts meet with heads of all relevant organizations (Government, United Nations, NGOs and private partners) involved in risk and disaster management. They look into the issues related to plans, policies, data sharing, coordination, institutional arrangements and national spatial database infrastructures. A one-day workshop involving all stakeholders is an important event during the mission.

The main outcome of the mission is the report with critical observations, assessments and recommendations aimed at enhancing the use of space-based information in risk and disaster management. The host government and local UN organizations act on these recommendations by reflecting them in the various national plans and programmes. The TAM paves the way for a long-term cooperation between UN-SPIDER and the Member State including follow-up actions through capacity building programmes and support during disasters.

Technical Advisory Mission

Myanmar: Gearing up to use space-based information

Like other countries in the Bay of Bengal, Myanmar is exposed to multiple natural hazards which include floods, landslides, earthquakes, droughts, and fires in major parts of the country. Its coastal regions are specifically exposed to cyclones, storm surges and tsunamis.

To promote mitigation efforts and to strengthen resilience against these hazards, the Relief and Resettlement Department of the Ministry of Social Welfare (RRD) and the United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA) Myanmar requested UN-SPIDER's support in expanding and strengthening the capacity of Myanmar to use space-based information. RRD has a mandate focusing on emergency response and disaster-risk reduction, and wishes to establish a centre that will provide decision support to authorities.

UN-SPIDER carried out a Technical Advisory Mission to Myanmar from 19 to 23 March 2012. The mission aimed at evaluating the current and potential use of space-based information in all phases of the disaster management cycle and strengthening disaster-risk management in the country by providing better access to space-based information. The mission team included remote sensing as well as risk and disaster management specialists.

The mission allowed Myanmar agencies to establish links with the institutions represented by the team members. At the same time, the mission team was able to get in contact with representatives of RRD and with many stakeholders of the Myanmar disaster management community, including the Ministry of Science



The mission team in Myanmar

and Technology, the Ministry of Water Resources, the Survey Department, the Forest Department, the Department of Meteorology and Hydrology and the Remote Sensing Department (Mandalay) as well as the Japanese International Cooperation Agency JICA, the Red Cross, and various United Nations agencies.

Additionally, a one-day workshop was organized on the fourth day of the mission with 55 participants from several agencies and institutions working on risk and disaster management. The workshop was effective in generating awareness as well as in getting valuable inputs to strengthen space technology in disaster management.

It is expected that the recommendations of the TAM will find a place in the programmes supported by the Government and the United Nations Country Team (UNCT) providing crucial inputs to the United Nations Strategic Framework. UN-SPIDER will work closely with the Government and United Nations agencies to facilitate the implementation of the recommendations outlined by the team. ■



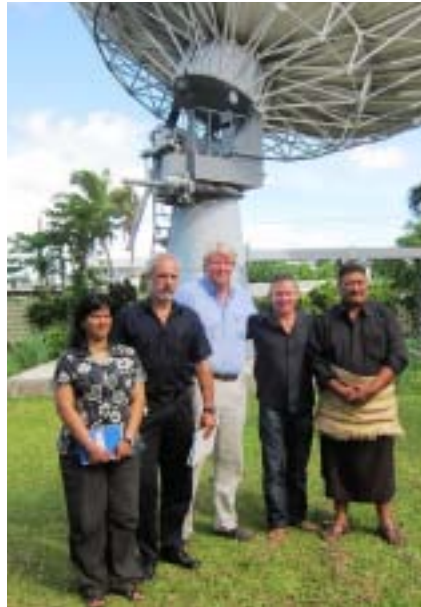
Mission team involved in discussing observations and recommendations

Tonga: Raising awareness and assessing capacities

The Kingdom of Tonga is exposed to earthquakes, volcanoes, cyclones and other coastal hazards such as storm surges. In September 2009, Tonga was affected by a tsunami, which provoked extensive impacts on one of the outer islands.

With the continuous support being provided by the Government of Austria, the UN-SPIDER Programme increased its support to Tonga by having carried out a Technical Advisory Mission, at the request of the Tongan Government via the Ministry of Lands, Survey and Natural Resources on 20-23 March 2012.

UN-SPIDER staff was joined by experts from the Secretariat of the Pacific Community (SOPAC), the United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA), the Geographic Information System (GIS) Division of the Ministry of Lands, Survey and Natural Resources, academia and a leading regional crowdsourcing expert. The mission built



The mission team in Tonga

upon the Technical Advisory Support that UN-SPIDER has been providing to all Pacific Island Countries since 2008.

The Mission included meetings with key stakeholders and a half-day workshop for senior policy makers, data providers, and end-users of the risk and disaster management community with the purpose of awareness generation and assessing the country needs and capacities.

The aim of the mission was to:

1. Review current policies, procedures and mechanisms related to the use of geo-spatial information and make recommendations;
2. Engage key stakeholders who are custodians of geo-spatial data relevant to disaster risk management;
3. Develop an institutional strengthening strategy for stakeholder agencies (individuals, institutions and infrastructure); and finally
4. Develop a long-term association with UN-SPIDER to take advantage of outreach activities, institutional strengthening programmes and resources available through the UN-SPIDER network. ■

Technical Advisory Missions carried out since 2008



Kamel Tichouiti on the role of the Algerian Space Agency in mitigating locust infestations in Algeria and Libya



Kamel Tichouiti

The Algerian Space Agency (ASAL) has been hosting the UN-SPIDER Algeria Regional Support Office since 2009. ASAL, which was established in 2002, implements national policies concerning the promotion and development of the use of space for technological, scientific and practical applications. Kamel Tichouiti is the Head of the Department on Major Risks and Geo-environment in the Space Applications Centre. The department deals with the management and the follow-up of major disasters in Algeria using space-based information thus supporting national disaster management and civil protection agencies. Hazards affecting the region include floods, forest fires, desertification, and locust infestations.

UN-SPIDER: Algeria and other countries in Northern Africa have recently been suffering from major locust infestations. Can you tell us which role ASAL played in mitigating this hazard?

Kamel Tichouiti: In January 2012 the locust activity in the Wilaya d'illizi region in Algeria had significantly increased with several swarms coming from biotopes in South-West Libya and South-East Algeria. Consequently, the Algerian RSO and ASAL jointly supported the National Institute for the Protection of the Vegetation (INPV) by creating a map indicating the risk zones for the region, analyzing the ecological conditions of the migratory locust for the period January to April 2012. We did this by interpreting medium resolution satellite imagery that was made accessible to us by the Disaster Monitoring Constellation UK-DMC-2 and the Regional Center for Mapping of Resources for Development (RCMRD), which facilitated the tasking of the US-satellite EO-1.



Situation maps derived from satellite imagery

UN-SPIDER: How exactly did you analyze the risk of the locust infestation using satellite imagery?

Kamel Tichouiti: The five 22m resolution images obtained allowed us to precisely identify zones with high chlorophyll levels. High chlorophyll levels indicate favorable conditions for the locust to reproduce thus representing a high risk for the insects' infestation

to increase. This imposes a threat to the local agricultural production. We were able to identify 39 high potential reproduction zones spread over 330 000 km² for the period January through April 2012. They are located in South-East Algeria (Wilaya d'illizi) and in the South-West of Libya, mainly running along the Oueds (riverbeds).

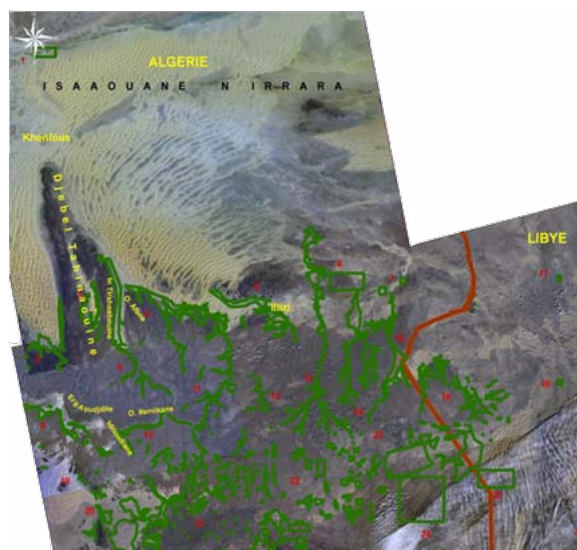
UN-SPIDER: After this analysis, what are ASAL's next steps in supporting the mitigation of locust infestations?

Kamel Tichouiti: An ecological analysis of these locust biotopes based on satellite imagery for the month of May is underway by the Algerian RSO. Once produced, this new analysis will be made available to the National Institute for the Protection of the Vegetation (INPV) so that they can carry out prevention actions in Algeria and share their evaluations with the Food and Agricultural Organization (FAO), which is active in Libya on this issue as well. ■

Facilitating technical support

In the case of emergencies and disasters, UN-SPIDER provides technical support by taking the role of a bridge linking the disaster management agencies in charge of response operations with space agencies or the mechanisms which have been established by the space community such as the International Charter: Space and Major Disasters. UN-SPIDER provides this support through the activation of its network of Regional Support Offices (RSO) and through links with specific space agencies.

An RSO is a regional or national centre of expertise that is set up within an existing entity by a Member State or group of Member States. This network of RSOs is at the core of UN-SPIDER's Advisory Support efforts as RSOs coordinate with UN-SPIDER on a regular base providing not only technical support, but also support capacity building activities and knowledge management. UN-SPIDER has RSOs in Asia, Latin America, the Caribbean, Europe and Africa.



The green lines mark high potential reproduction zones for locust in South-West Libya and South-East Algeria.

Mesoamerica: Using radar images for flood mitigation

In recent decades Mesoamerican countries have experienced more frequent and intense floods triggered by tropical storms and hurricanes. In the case of Mexico, losses associated with the 2010 floods reached extremely high levels similar to those associated with the 1985



earthquake. In the case of Guatemala and El Salvador, hurricane Mitch (1998), tropical storms Stan (2005), and Agatha (2010) manifested the vulnerability of road infrastructure, housing, agriculture, health, education and other sectors of development.

In order to support these countries in their response efforts in the case of floods, UN-SPIDER and the Regional Training Centre on Space Science and Technology for Latin America and the Caribbean (CRECTEALC) organized a training course in October 2011 targeting staff of Civil Protection agencies, national planning institutes and environment agencies from Mexico, Guatemala, El Salvador and Belize.

Instructors from the Argentinean Institute of Astronomy and Space Physics (IAFE) and from the Water Center for The Humid Tropics of Latin America and the Caribbean (CATHALAC) provided participants with the theoretical background regarding radar imagery and complemented the course with practical exercises on the use of specific soft-

ware packages such as NEST, ENVI, ERDAS Imagine, ArcGIS and MapReady. The course focused on the characteristics of radar images, on the peculiarities concerning their acquisition by specific satellites with such capabilities (orbital trajectory of acquisition, type of band, polarization mode), and on the features displayed in the images emerging from specific characteristics of microwaves; scatterers on the ground including forests, crops, and pastures; and specific conditions of the ground such as roughness and permanent or intermittent presence of water (water bodies, swamps, marshes and wetlands).

In addition, the instructors made special emphasis on the detection of water using a variety of post-processing algorithms, including speckle filtering, change detection and multi-temporal analysis. As data from optical sensors can also be used to detect the presence of floods, the processing of radar imagery was supplemented with techniques to process optical imagery, including the generation of indices for determining extents of inundated areas. ■

Capacity Building in UN-SPIDER

In the context of UN-SPIDER, Capacity Building is defined as “the process to facilitate the strengthening of the capacity of individuals and institutions related to the use of space-based information to prevent, to mitigate, and to react effectively to the challenges posed by natural hazards and humanitarian crises.” The main target groups include governmental disaster-risk management and emergency response agencies, researcher agencies, regional and international organizations.

UN-SPIDER Capacity Building efforts include four complementary types of activities:

- Providing policy-relevant advice to institutions and governments regarding the use of space-based (spatial) information to support the full disaster management cycle;
- Facilitating access to space-based data and services;
- Facilitating the training of individuals on access to and use of such data;
- Facilitating access to infrastructure, hardware, and software, and services for space-based applications.

In its role as a facilitator, UN-SPIDER has established and continually updates three databases focusing on training opportunities offered by a variety of institutions worldwide, whether e-learning courses, short term courses or academic programmes leading to degrees. These databases are accessible through the UN-SPIDER Knowledge Portal. The Knowledge Portal also serves as a host to the curricula which UN-SPIDER is developing, for example “Remote Sensing for Emergency Response”.

UN-SPIDER works closely with its network to conduct short training courses on remote sensing, telecommunications and satellite-assisted navigation and positioning. Other trainings raise awareness about the existing international mechanisms to access space-based information. UN-SPIDER has provided support to training activities in Latin America, the Caribbean, Africa, Asia, and Asia-Pacific. In the longer perspective, UN-SPIDER is working on the promotion of policies that focus on capacity building and institutional strengthening, so that its efforts can have the desired long-term sustainability.

Database of Training Opportunities

choose from:

find out about:

Web-based courses

GENERAL INFORMATION

SPECIFIC INFORMATION

Title of event

Target Audience

Organizers

Requirements

Short-term courses

Location

Deadline for registration

Duration

Web link

Academic programmes

Language of instruction

Tuition fee – financial support

Topics

Additional information

access the database at: www.un-spider.org/capacity-building-guides/training-opportunities

Capacity Building

India: Training on the use of space technology

The Asia-Pacific region is especially prone to frequent flooding, cyclones and tsunamis. Given the critical role of information, communication and space technology in improving the effectiveness of response to major disasters, UN-SPIDER conducted Technical Advisory Missions to Bangladesh, Sri Lanka and Myanmar in 2011 and 2012.

In the follow-up of these missions, UN-SPIDER supported the four-week long training course "Space technology applications in Disaster Risk Reduction" organised at the Centre for Space Science Technology Education for Asia

and the Pacific (CSSTEAP), the UN affiliated regional centre based in Dehradun, India.

The overall objective of this course was to strengthen the participants' knowledge regarding how space-based information, services and solutions can be used to reduce disaster risks and losses. During the first two days of the course, UN-SPIDER provided a brief overview on the relevance of space technology in the context of the Hyogo Framework for Action and addressed the effective use of space technology for disaster-risk reduction. UN-SPIDER also conducted interactive sessions

with participants to understand the current situations in the countries represented by participants and provided insights about possible support from UN-SPIDER.

The course was jointly carried out with the Indian Institute of Remote Sensing, the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) and the United Nations University (UNU). UN-SPIDER sponsored 5 officials from Bangladesh, Sri Lanka, Myanmar and Solomon Island. A total of 27 participants from 17 countries benefited from the course. ■



Inauguration of the training

Capacity Building

Cameroon: Following up on the Technical Advisory Mission

In June 2011, UN-SPIDER conducted a Technical Advisory Mission in Cameroon following the request by the Government of Cameroon, represented by the Ministry of Territorial Administration and Decentralization, Department of Civil Protection. The goal was to assess the use of space-based technology and information for disaster management and emergency response in Cameroon, to identify potential areas where space-based technology and information could play a greater role, and propose recommendations on how to improve Cameroon's access to and use of space-based technology and information.

From 7 to 11 May 2012, UN-SPIDER supported a follow-up training in remote sensing for disaster management upon request of the UN-SPIDER National Focal Point for Cameroon. The training was conducted jointly with the United Nations University Institute for Environment



ILWIS training session

and Human Security (UNU-EHS). Some 25 participants from the Ministry of Territorial Administration and Decentralization (MINATD) and various other Ministries and Universities attended the training. In addition, UN-SPIDER and UNU-EHS funded the participation of five representatives from four other Central African States.

Trainers from the Regional Centre for Training in Aerospace Survey (RECTAS) and UNU-EHS carried out training sessions in French, using Geographic Information System & Remote Sensing software donated by Esri (ArcGIS 10 French) and the ILWIS Academic version. Besides sample imagery provided by RECTAS for the training modules, the group had access to recent very high resolution sample images of hotspots in Cameroon, courtesy of Digital Globe, Inc.

The training covered basic elements of remote sensing, GIS basics, simple data extraction and geo-referencing techniques, accompanied by various presentations and visual material on the use of remote sensing for disaster management. The training also aimed at raising awareness for existing mechanisms to access space-based information such as the International Charter: Space and Major Disasters and GMES.



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based Information for Disaster Management and Emergency Response - UN-SPIDER" as a new United Nations programme to be implemented by UNOOSA. UN-SPIDER is the first programme of its kind to focus on the need to ensure access to and use of space-based solutions during all phases of the disaster management cycle, including the risk reduction phase which will significantly contribute to the reduction in the loss of lives and property. UN-SPIDER Newsletter, Volume 1/12, May 2012. © United Nations Office for Outer Space Affairs.