UNITED NATIONS
Office for Outer Space Affairs

# UN-SPIDER

# Capacity Building Strategy

# Table of Contents

# List of Acronyms

| | |
|---|---|
| **ADPC** | **Asian Disaster Preparedness Center** |
| **ADRC** | **Asian Disaster Reduction Center** |
| **AIT** | **Asian Institute of Technology** |
| **CDERA** | **Caribbean Disaster Emergency Response Agency** |
| **CEPREDENAC** | **Central American Coordination Center for Natural Disaster Prevention** |
| **COPUOS** | **Committee on the Peaceful Uses of Outer Space (United Nations)** |
| **DLR** | **German Aerospace Center** |
| **EO** | **Earth Observations** |
| **GEO** | **Group on Earth Observations** |
| **GIS** | **Geographic Information Systems** |
| **GNSS** | **Global Navigation Satellite Systems** |
| **IFRC** | **International Federation of the Red Cross and Red Crescent Societies** |
| **ISDR** | **International Strategy for Disaster Reduction (United Nations)** |
| **ITC** | **International Institute for Geo-Information Science and Earth Observation** |
| **KM** | **Knowledge Management** |
| **KP** | **Knowledge Portal (UN-SPIDER)** |
| **M&E** | **Monitoring & Evaluation** |
| **NFP** | **National Focal Points (UN-SPIDER)** |
| **OCHA** | **Office for the Coordination of Humanitarian Affairs (United Nations)** |
| **OOSA** | **Office for Outer Space Affairs (United Nations)** |
| **RCSSTE** | **Regional Center for Space Science and Technology Education (UNOOSA)** |
| **RSO** | **Regional Support Office (UN-SPIDER)** |
| **SWOT** | **Strengths, Weaknesses, Opportunities, and Threats Analysis** |
| **TAM** | **Technical Advisory Mission (UN-SPIDER)** |
| **TAS** | **Technical Advisory Support (UN-SPIDER)** |
| **UNDP** | **United Nations Development Programme (United Nations)** |
| **UNESCO** | **United Nations Educational, Scientific, and Cultural Organization** |
| **WMO** | **World Meteorological Organization (United Nations)** |
| **Z_GIS** | **Centre for Geoinformatics, University of Salzburg** |

# I Introduction

Throughout the centuries, societies around the world have faced the consequences of natural phenomena such as earthquakes, landslides, volcanic eruptions, tsunamis, etc. The systematic analysis of such phenomena and their impacts reflected in the disasters which they provoke has allowed scientists to characterize the peculiarities of such natural events, as well as those social trends which make societies vulnerable to these events. But while in the twentieth century governments established national emergency committees to respond to such events in a more coordinated fashion, the increasing number of disasters around the world forced those governments to rethink their strategy.

Under the leadership of the United Nations, the International Decade for Natural Disaster Reduction between 1990 and 1999 paved the way for a change in the paradigm concerning how to approach disasters, introducing the notion of *risks* as preceding disasters and *risk management* as the set of measures aimed at reducing the extent of disasters. In this context, a society is at risk when it is exposed to a hazard and is vulnerable to such an event. Thus, risk is expressed as this combination of hazard and vulnerability. Conceptualized in this fashion, the reduction of the level of risk of a community, either through the reduction in its exposition to the hazard, or through a reduction in its vulnerability, should then lead to a reduction in the impacts provoked by events such as earthquakes, floods, eruptions, etc.

The year 1999 is of special relevance in this discussion, as it was the year in which the Third UNISPACE Conference took place, where the roots of the UN-SPIDER programme began to take shape. Convinced that satellite-based information and services could be used to reduce disasters, the Committee on the Peaceful Uses of Outer Space (COPUOS) promoted the establishment of the *Action Team on Disaster Management* to assess the feasibility of establishing the UN-SPIDER programme. Between 2000 and 2004, this Action Team identified several gaps and constraints which did not allow disaster-risk management agencies to make efficient and timely use of space-based information[1], for example:

1. Many countries had little or no access to the benefits of space systems.
2. There are few national focal points to facilitate access to space-based information and services.
3. There is a gap between Disaster-Risk Management agencies and Space Application providers.
4. There are difficulties in accessing archived space-based data and information due to a lack of its organization in terms of a database.

In addition, while there have been many training events and courses offered on a variety of topics concerning disaster-risk management; the Action Team concluded that the use of space-based information for such a purpose had only been tackled within the context of pilot efforts in few developing countries. As a consequence other gaps identified by this Team were:

5. The lack of efforts to standardize procedures concerning the use of space-based data and information for disaster-risk management.
6. The lack of trained staff within disaster management agencies that have the capacity to make use of space-based data and information for risk management, disaster response, and recovery.

Taking into consideration these findings, the General Assembly of the United Nations established the UN-SPIDER programme through its resolution 61/110 of 14 December 2006 to provide universal access to all countries and all relevant international and regional organizations to all types of space-based information 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.

Capacity-building and the strengthening of institutional arrangements at all levels are the key to increasing the ability of agencies at the national level and organizations at the regional and international levels to effectively use space-based information and services for disaster reduction,

[1] Ref: A/AC.105/893; pages 5-7.

preparedness, response and recovery[2]. These activities include compiling information relevant to capacity-building opportunities and the facilitation of capacity-building efforts targeting practitioners and end-users in a variety of agencies, networks, and organizations.

In order to facilitate capacity-building efforts, UN-SPIDER has elaborated this Capacity-Building Strategy following the guidelines agreed upon by the United Nations General Assembly[3]. Essential elements taken into consideration during the elaboration of this strategy are:

- The recognition that capacity building goes beyond training of individuals, and includes such aspects as the strengthening of institutional frameworks and procedures regarding how to solve problems and conduct activities to fulfil their mandates.
- The conduction of training efforts through the network of Regional Centres on Space Science and Technology Education affiliated to the United Nations and other Centres of Excellence such as the International Institute for Geo-Information Science and Earth Observation (ITC) in the Netherlands, the Asian Institute of Technology (AIT) in Thailand, the Centre for Geoinformatics University of Salzburg (Z_GIS) in Austria, and with the support of agencies such as the German Aerospace Center (DLR).
- The elaboration of a curriculum tailored to the needs of the target audience and which should contribute to achieving the objectives of UN-SPIDER.
- Coordination of activities with the support of the Regional Support Offices and National Focal Points established under UN-SPIDER, and with other regional and international organizations such as the International Strategy for Disaster Reduction (ISDR); the Group on Earth Observations (GEO); United Nations agencies such as UNOCHA, WMO, UNDP and UNESCO; and regional organizations targeting risk reduction and emergency response such as CEPREDENAC and CDERA in the American hemisphere, the Asian Disaster Preparedness Center (ADPC) and the Asian Disaster Reduction Center (ADRC) in Asia, and the International Federation of the Red Cross and Red Crescent Societies (IFRC).

The expected beneficiaries from these capacity building efforts include the disaster-risk management and the humanitarian communities, non-government organization which provide support, academic and scientific agencies involved in monitoring events, private-sector space technology companies interested in providing support or in developing products needed to support activities targeting disaster risk reduction and insurance companies.

This document presents the Capacity Building Strategy of UN-SPIDER, which has been elaborated with inputs from the Bonn 2007, Salzburg 2008, and Vienna 2009 UN-SPIDER workshops, and with the support of experts from various centres of excellence and international organizations. It begins outlining how these efforts are nested within the UN-SPIDER framework of activities; and then proceeds to present the proposed approach to capacity building targeting the training of **I**ndividuals on the use of space-based information to support the conduction of activities targeting the full disaster management cycle, the **I**nstitutionalization of the use of this type of information in agencies and organizations responsible for the conduction of these tasks and supporting access to hardware, software and related **I**nfrastructure to make use of such information (the "**3 Is**: **I**ndividuals, **I**nstitutionalization of the use of space-based information, and **I**nfrastructure); and the corresponding implementation strategies. The document concludes with a section focusing on Monitoring and Evaluation, where short and long terms goals are discussed.

[2] Ref. A/AC.105/893, page 13.
[3] Ref. A/RES/61/110, page 2 and A/AC.105/893; pages 12 and 13

## II The Mission of UN-SPIDER and Capacity Building

Experience shows that the conduction of activities in the context of the full disaster management cycle spans a variety of agencies from the public and the private sector, at different levels, and is best conducted through a coordinated approach. An essential task in either disaster-risk management or emergency response is the use of precise information on which to assess existing or emerging situations to make decisions regarding which course of action to take. But while space-based information can be useful in support of the full disaster management cycle as complementary to ground-based information, it has been recognized that such information is rarely used by those persons in charge of coordinating and conducting activities in the context of the full disaster management cycle. Recognizing this fact, the mission of UN-SPIDER is put forward as follows[4]:

> *To ensure that all countries and international and regional organisations have access to and develop the capacity to use all types of space-based information to support the full disaster management cycle.*

To fulfil this mission, UN-SPIDER has been established on three pillars to serve as a:

**Bridge** to foster alliances between the space and the disaster management communities, through the creation of a forum where both communities can meet and discuss relevant issues.

**Gateway** to promote access to and the dissemination of information, including case studies and best practices on the use of space-based data to support disaster management.

**Facilitator** of capacity building to increase the ability of individuals, agencies, and organizations to effectively access and use space-based services for disaster reduction, preparedness, response, and recovery.

Therefore, capacity-building efforts need to be conducted with the support of partner agencies in such a way that beneficiaries acquire the ability to access such space-based information and services, and subsequently make use of them in the most efficient and timely fashion.

Taking into consideration the fact that the preceding paragraphs target both access and subsequent use of space-base information for a variety of applications, it is important to complement the discussion with information related to the disaster-management cycle.

The **cycle of disasters** proposes that communities may experience disasters as a consequence of natural events which have a recurring nature. In this context, the aim of the cycle is to link the different tasks that are conducted before, during, and after any disaster. Figure 1 presents a schematic view of this cycle.

**Prevention** and **mitigation** activities are conducted to minimize risks associated with any hazard, and are conducted through the reduction in exposition to hazards and a reduction in vulnerabilities or through measures to impede their generation or increase.

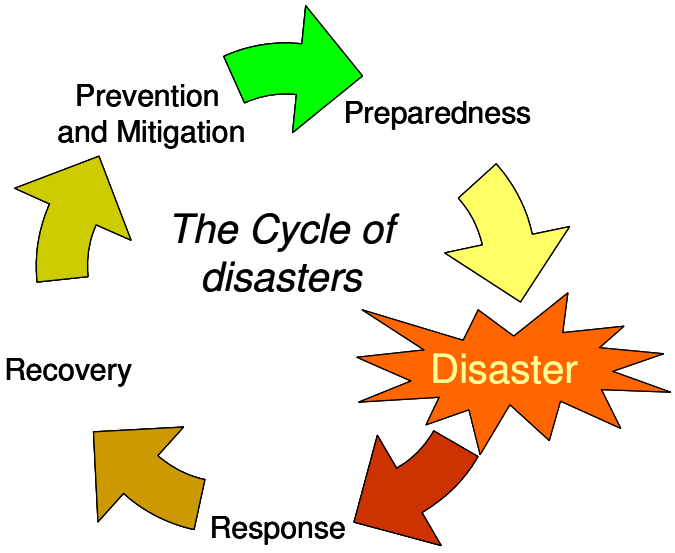


**Figure 1: The cycle of disasters.**

[4] Ref. A/AC.105/893, page 13.

**Preparedness** targets those measures implemented agencies and organizations to minimize the impact of specific events, aiming to provide a timely and efficient response in case of a disaster. **Response** and **Recovery** are then conducted after the disaster and include such phases as rehabilitation and reconstruction.

Taking into consideration the fact that the cycle of disasters targets disaster-risk reduction activities before a disaster, and emergency response and recovery after any disaster, capacity building efforts within UN-SPIDER have been designed and implemented to cover both aspects as well.

In addition, it is important to stress the fact that capacity building goes beyond the training of individuals to improve their skills and knowledge. If agencies in countries are to make use of such information to support the full disaster management cycle, it is imperative for such agencies to recognize its value in order to include such access to and use of this type of information as part of their standard operating procedures, and to recognize the value of capacity-building efforts. Accordingly, incentives, norms, regulations, and policies need to be institutionalized promoting the use of space-based information and applications as a way to achieve disaster risk reduction, which is essential for sustainable development.

The objective stated in the context of this Capacity Building Strategy is *to ensure that countries recognize the value of all types of space-based information, and therefore will access it to reduce the impacts of disasters and to respond more efficiently in case of such disasters through improved use of this type of information.*

As expected, to reach this objective, the target audience, composed of decision makers and staff in agencies and regional and international organizations; networks of practitioners, and communities of practice, need to improve their performance regarding access to and use of such information.

In this context, expected outputs associated with capacity building could be phrased as follows:

- At the level of agencies at the national level and organizations at the regional and international levels, as well as in the context of network and communities of practice, the value of space-based information and space-based services is recognized, and thus its use is institutionalized.
- At the level of individuals in these agencies, organizations, and networks; knowledge regarding space-based information is enhanced, and their skills to access and use such information are improved.

The next sections outline the proposed approach to capacity building that will be employed by UN-SPIDER, the activities to be implemented to reach the proposed outputs and achieve the proposed objective, and elements to be employed to monitor and evaluate the process of implementation of this strategy.

## III Capacity Building in the scope of UN-SPIDER

Based on its mission statement, UN-SPIDER has been established to ensure that all countries and international and regional organisations have access to and use all types of space-based information to support the full disaster management cycle. The goal is to ensure that communities which face the threats and consequences of disasters recognize the value of space-based information and then promote its use through disaster management agencies for such aspects as prevention, mitigation, preparedness, response, and recovery.

To achieve this mission, the United Nations General Assembly agreed to a set of activities to be conducted by UN-SPIDER in the context of the three pillars described in the previous section (Gateway, Bridge, and Facilitator of capacity building). As it is described in figure 2, UN-SPIDER will conduct a variety of activities to accomplish its mission. Taking into consideration the degree of advancement of agencies in some countries concerning the use of space-based information to support activities contemplated in all phases of the disaster management cycle, it is foreseen that in the context of more advanced countries, awareness, outreach, and technical advisory support will be sufficient for countries to access and use such information. However, in the case of other countries, capacity building efforts will also be required.

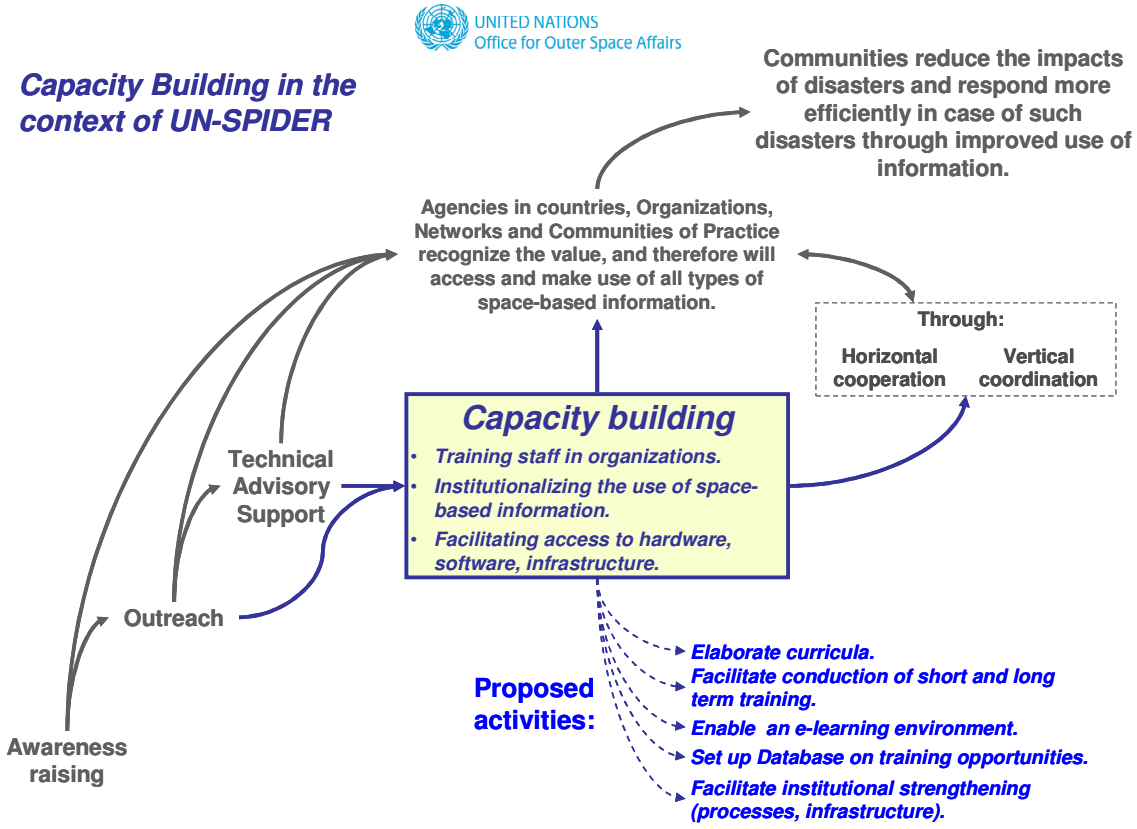


**Figure 2: Capacity building efforts in the context of UN-SPIDER.**

During its implementation phase, UN-SPIDER will focus on awareness and outreach activities. These activities will be conducted at the international and regional levels with the aim of providing visibility to the new programme and as a means to establish a critical mass of experts and practitioners from both the space applications and disaster management communities. Following both awareness campaigns and the organization of outreach workshops and related activities, UN-SPIDER will then target efforts at the country level via Technical Advisory Support (TAS). Among the first tasks to be conducted in any country is a Technical Advisory Mission (TAM), which should help such a country and UN-SPIDER identify how best to support activities regarding the use of space-based information and services, with the aim of establishing a subsequent programme of action.

Capacity building, as it will be described in subsequent sections, will be conducted through a variety of complementary approaches. It is important to stress the view that the aim of the capacity building effort is not only to train individuals in agencies at the national level and in regional and international organizations, but also strengthening capacities of such national agencies through policy-relevant advice. Capacity building activities will begin with the establishment of an Expert Group on Capacity Building that will assist UN-SPIDER in the elaboration of curricula, selection of contents and design of products necessary to carry out the proposed capacity building activities. The conduction of these activities will take advantage of horizontal cooperation and vertical coordination.

As an outcome of capacity-building efforts, practitioners in disaster management agencies, organizations and in networks and communities of practice should be able to access and use space-based information and services directly or via horizontal cooperation.

Horizontal cooperation is foreseen in those cases where efforts are conducted in an inter-institutional way, and vertical coordination where efforts include networking with regional or international agencies from the space community.

# IV Approach to Capacity Building

## IV.1 Main guidelines

As it was stated previously, the objective of the Capacity Building efforts of UN-SPIDER is *to ensure that countries recognize the value of all types of space-based information, and therefore will access it to reduce the impacts of disasters and to respond more efficiently in case of such disasters through improved use of this type of information*.

To achieve this goal, UN-SPIDER must conduct two types of efforts in parallel:

- At the level of decision-makers in agencies and organizations, UN-SPIDER must demonstrate the value of space-based information and space-based services so that its use becomes institutionalized.
- At the level of practitioners in these agencies, organizations, and networks; efforts by UN-SPIDER should facilitate training activities to increase their ability to access and make use of such information.

Briefly stated, the efforts must ensure that disaster managers become aware of the value of such information, and that access to such information is then facilitated through a variety of means for its subsequent use in all phases of the disaster management cycle.

### IV.1.1 Space-based information

An assessment of agencies in those countries which already make use of space-based information and services for a variety of applications indicates that at least four conditions are met in these countries.

| Condition | Comment |
|---|---|
| **Space-based data is available and accessible.** | It is important to recognize the fact that access to data will depend on such aspects as the required resolution (pixel-size), their characteristics (visible, infra-red, radar, single-wavelength or multi-wavelength), their cost, and whether there may be restrictions based on issues of national security for their access or not. |
| **Agencies recognize the relevance of using space-based information to make decisions.** | This condition is equally relevant, as the staff, even if capable, may not make use of such data if the leadership within the agency does not consider the use of space-based information as necessary or if the agency does not include such tasks in its framework of standard operating procedures. UN-SPIDER is fully aware of such a limitation and addresses it through policy-relevant advice to such agencies and governments. |
| **Staff in agencies posses the knowledge and the skills to access and process this information.** | It is important to address the needs of staff to posses both the knowledge and the skills to access and process space-based data, and to extract relevant information for the desired purposes targeting disaster-risk reduction and emergency response. UN-SPIDER will target these efforts through training activities. |
| **Facilities, hardware and software to acquire, process, and use this information are available and operational.** | This condition, basically associated with infrastructure, is essential for staff who posses both the knowledge and skills to be able to access and process the information adequately. |

The design of the capacity building strategy in the proposed framework of the 3Is is tailored for UN-SPIDER to target all these four conditions, and not just the training of staff for example, which although essential, is not sufficient to ensure that the capacity to make use of information has been established in a country.

### IV.1.2 The Disaster Management Cycle

Taking into consideration the fact that UN-SPIDER must support all phases of the disaster management cycle, two key issues need to be considered in the context of capacity-building:

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| Risks (Hazards and vulnerabilities) may vary from locality to locality. | Different types of agencies are involved in the different phases of the disaster cycle. |

The first issue implies that UN-SPIDER must be able to target a variety of risks and tailor its capacity-building activities in different regions of the world based on the types of risks which may exist in such regions and localities.

The second issue implies that it is imperative for UN-SPIDER to tailor its capacity-building activities targeting at least two types of target groups: the group focusing on disaster-risk management activities (prevention, mitigation and recovery) and the group targeting disaster response activities (preparedness and response).

### IV.1.3 Capacity building

Taking into consideration the preceding sections, capacity building in the framework of UN-SPIDER is suggested as:

> The process to facilitate the strengthening of the capacity of individuals, teams, and agencies related to the use of space-based information **to prevent, mitigate, and respond** effectively to the challenges posed by natural hazards and related humanitarian crises.

Capacity building would then include four types of activities:

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

Training, in the context of UN-SPIDER, may be defined as:

> A process to facilitate **knowledge sharing and learning** with the overall objective to continuously improve the skills of individuals related to the use of space-based information **to prevent, mitigate, and respond** effectively to the challenges posed by natural hazards and related humanitarian crises.

As expected, there is a strong interdependency between training and knowledge management. Without the vast information on best-practices made available, training will be ineffective and cannot contribute to the improvement of the collective capacity of organisations. In the context of UN-SPIDER, Knowledge Management ('KM') is defined as:

> A range of disaster management and emergency response practices related to the use of space-based information applied by organisations to identify, create, represent, and distribute their knowledge with the objective to improve performance, seek innovation, transfer lessons learnt (for example between projects for validating services) and the general development of collaborative practices. Knowledge Management is frequently linked to the idea of learning organisations with a focus on specific knowledge assets and the development and cultivation of the channels through which knowledge flows.

The following sections outline how UN-SPIDER will target capacity-building efforts:

## IV.2 Individuals

Through training programmes coordinated by UN-SPIDER, individuals will widen their knowledge and improve their skills with the objective of enhancing their performance in the use of space-based information to support activities in all phases of the disaster management cycle. In the context of the use of space-based data and information for disaster-risk management, training activities will target individuals with the purpose of ensuring that such individuals will access and make use of such information to support the full disaster management cycle. To this end, training efforts within UN-SPIDER will be approached through four components:

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| **Curricula** | Taking into consideration the needs of its target audience, specific curricula will be elaborated with the support of Centres of Excellence, Regional Centres on Space Science and Technology Education, the network of Regional Support Offices, experts from the space community and the disaster management and emergency response communities and the Expert Group on Capacity Building to be set up by UN-SPIDER. Two separate curricula are envisioned:<br>**Disaster-risk management** and **Emergency response**<br>As stated before (sub-section IV.1.2), two curricula are required to reach the two target audiences (disaster-risk management and emergency response), as these target audiences make use of different types of space-based information, space-based applications and services.<br>The development of the curricula will include the design of the training approach, learning objectives, syllabi, content selection. |
| **Short/Long term**<br>**training activities** | This component will focus on the design and conduction of standard training activities with the support of Centres of Excellence, Regional Centres on Space Science and Technology Education, and other regional and international organizations. Short-term training programmes will target specific contents, such as the training on the use of particular tools or to conduct particular processes with the aim of strengthening the capacity of individuals. Long-term activities will target a combination of contents. Long-term activities are tailored to enhance capacities of agencies or to enhance the synergies among agencies.<br>Activities in this component include workshops and exercises (2 – 5 days), short, intensive training events (spring or summer schools, block courses, 1 – 3 weeks), and courses (one to several months).<br>Workshops will target very specific topics and will be structured in such a way that they concentrate on specific skills. In a similar fashion, contingency and near-real-time exercises will be set up with realistic scenarios in mind to complement other training activities.<br>Short, intensive training events (for example spring and summer schools or block courses) will include theoretical discussions as well as hands-on training on basic space technology and its uses for disaster risk management and emergency response; Geographical Information Systems (GIS); interpretation / visualization of spatial data; and applications via examples and case studies. As expected, such courses will be theme-dedicated. In addition, these events will promote the exchange between Earth Observation (EO) providers and end-users.<br>Courses will provide an overall view to use space-based information for disaster-risk management, targeting the use of this information for a variety of hazards; and in the case of emergency response targeting not only the use of information, but also other spatial applications (Global Navigation Satellite Systems (GNSS) and satellite communications) and how to activate structures aimed at supporting disaster response.<br>Prior to the conduction of training activities, UN-SPIDER, with the support of an |

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| | Expert Group on Capacity Building, will design and setup of modules which will target particular content considered as necessary by UN-SPIDER.<br><br>Training modules will include case studies, best practices, guidelines regarding how to conduct specific tasks related to access and use of space-based information for disaster-risk reduction and emergency response. The modules will be complemented with links to reference material on the more general aspects of space-based technologies and services, and disaster risk management and emergency response. |
| **E- learning** | E-learning will be a complementary mode to the standard workshops, short intensive training events, and courses which were addressed above in relation to training activities.<br><br>Efforts will be conducted by UN-SPIDER to promote the support of regional and national training centres to host such e-learning segments, including universities which target efforts on the topics of space-based information, geo-information, and disaster-risk management. To this end, the Knowledge Portal of UN-SPIDER will be structured to link such efforts. In addition, the Knowledge Portal will be fitted with guidelines and additional information that will complement e-learning efforts.<br><br>The E-learning component will be designed with the support of Regional Centres on Space Science and Technology Education, Centres of Excellence, and Space Agencies taking into consideration existing e-learning platforms which have been set up by a variety of agencies, including UN organizations. As in the previous case, training material will be developed to fit the needs of this type of training. |
| **Database of training opportunities:** | Taking into consideration the existence and conduction of training activities by national, regional, and international agencies worldwide, a clearinghouse of training opportunities will be established and continuously updated. Criteria used to design this database include:<br><br>➢ geographical coverage;<br>➢ the range offered (topics, duration, qualification);<br>➢ indicators for quality assessment;<br>➢ language of instruction<br><br>In addition, criteria will be developed to evaluate existing training offers, and results will be discussed and disseminated. |

As expected, a blended learning approach combining e-learning and short/long term training activities is foreseen to complete the training of individuals working in the areas of disaster-risk management or emergency response employing the format of *workplace learning*.

## IV.3 Institutionalizing the use of space-based information

Strengthening of agencies in the context of UN-SPIDER relates to the provision of policy-relevant advice concerning how to implement the use of space-based information and space applications within the working environment of agencies devoted to support all phases of the disaster management cycle. As a long-term activity, it will be initiated through an outreach process targeting decision-makers within these agencies concerning the benefits of using space-based information and space applications to support the full disaster management cycle and it will be conducted through twinning efforts, with the aim of supporting agencies in the modification of the procedures and methods in which they conduct specific activities such as the use of information for decision making purposes.

Twinning in this context would encompass UN-SPIDER facilitating the link between one or various agencies in countries which already make use of space-based information and services and one or

various agencies in a developing country, so that through examples, agencies in developing countries can modify their operating procedures regarding the use of information to support the full disaster management cycle.

## IV.4 Infrastructure

As stated in the introduction to this section, a key element required for agencies to access and make use of space-based information to support the full disaster management cycle relates to infrastructure. Infrastructure, in this context, refers to facilities, equipment, hardware, software, and services required to be able to access the information, and to make use of it.

Taking into consideration the fact that space-based data is managed and processed using sophisticated information technologies, and recognizing the role of the internet as a medium through which information is now typically exchanged and as a way to access information; UN-SPIDER is aware that capacity-building efforts may also include in some cases supporting agencies to seek resources to acquire and maintain such infrastructure.

Besides the technical infrastructure, the essential pre-requisite for effective information support is a structured and well-maintained spatial data infrastructure – without it, all geo-referenced data cannot be transferred into meaningful information.

# V Implementation Guidelines

Taking into consideration the guidelines put forward by the United Nations General Assembly when setting up the UN-SPIDER programme, in particular its view concerning the role of UN-SPIDER as a facilitator in the context of capacity building; such efforts will be based on the following strategies:

- Recognize the fact that agencies and practitioners in developing countries may already possess some capacities, and thus ensure that capacity-building efforts are structured in order to span different levels.
- Design the capacity-building approach with the support of an **Expert Group on Capacity Building** to be established by UN-SPIDER.
- Conduct capacity-building activities through the Regional Centres for Space Science and Technology Education affiliated to the United Nations, Centres of Excellence in all continents of the world; UN training centres with relation to UN-SPIDER; and other national or regional training centres where remote sensing and earth observation applications are taught.
- Coordinate efforts with the network of Regional Support Offices (RSOs) being set up by governments for UN-SPIDER and with the network of National Focal Points (NFPs) which have been nominated by government explicitly for UN-SPIDER, as well as with Regional Centres or Agencies devoted to Risk Reduction and Emergency Response.
- At the global level, coordinate efforts with the International Strategy for Disaster Reduction (ISDR), aligning its efforts along the lines of the Hyogo Framework for Action; with the Group on Earth Observations (GEO) which is also conducting similar international efforts as UN-SPIDER on a variety of topics including capacity building; with UN-based efforts conducted by United Nations entities and with other international agencies.
- Use a blended-learning approach based on e-learning and face-to-face instruction.
- Take advantage of training activities worldwide conducted by a variety of national, regional, and international agencies, through the set-up and dissemination of a database of training opportunities.

Capacity-building efforts will be conducted in a systematic fashion to ensure that capacities within agencies are strengthened with respect to access and use of space-based information to support the full disaster management cycle. Recognizing the fact that it is the responsibility of national governments to reduce risks and hence disasters as stated in the Hyogo Framework for Action since 2005, UN-SPIDER will ensure that its capacity building activities are conducted to support national platforms for disaster reduction which are being established through efforts led by ISDR. This approach will ensure that efforts contribute to the strengthening of capacities in those agencies which have made the commitment to be a member of such national platforms, and aims at eluding isolated approaches that may not lead to long-term results.

In the context of training activities, a regular training programme will be set up to ensure that participants complete a set of training activities in the format of blended learning, which involves both e-learning and face-to-face instruction Those participants who complete the training programme will receive a certificate issued by UN-SPIDER, and will subsequently be involved in other activities to be conducted by UN-SPIDER.

## V.1 Partners in Capacity Building efforts

Capacity building efforts within a given country will be conducted in coordination with the National Focal Point and with the Regional Support Office that has been assigned by UN-SPIDER to support assistance to that country. The role of the RSO is essential to ensure that capacities within a region are built in a uniform basis, so that horizontal cooperation can then be established among neighbouring countries once capacity-building efforts have been conducted.

UN-SPIDER will facilitate training through a variety of activities conducted by its partners. These will include:

- Mobilization of experts to workshops and training activities offered by its partners on topics of relevance to UN-SPIDER.
- Mobilization of practitioners and staff in need of training on specific topics to activities offered by its partners.
- Organization of specific training activities with the support of its partners.

In addition, selected UN-SPIDER partners will be requested to provide assistance in the elaboration of the curricula, as well as regarding the identification of best practices, case studies, and content that should find its way into the e-learning component and into traditional courses and training activities conducted by or on behalf of UN-SPIDER. The modality of working groups will be employed for such a purpose, and the regional and international UN-SPIDER workshops will become the setting where such working groups interact.

## V.2 Types of training events

The types of events to be conducted in the context of training are outlined in Table 1.

**Table 1: Types of events to be employed by UN-SPIDER in the context of training.**

| | Definition | Organisation & Frequency | Targeted Participants | Funding |
|---|---|---|---|---|
| **High-Level Seminar** | To present the quantitative and qualitative benefits of space/geographic information. | Every year, 1 day, linked with other international events that may congregate this special target audience | Top-level managers and decision-makers in agencies, regional and international organizations | Co-funding by UN-SPIDER (US$ 10-15,000) |
| **Training Course** | Provide in-depth training on a technical subject | Training agency<br>Recurring, 3days to 3 weeks | Technical staff<br>Max. 30 | Co-funding by UN-SPIDER (US$ 10-15,000) |
| **Summer School** | Professional and/or academic training for a small group with different backgrounds | NRSO, NFP, Partner…<br>Tbd, 1 or 2 weeks | Participants with different backgrounds<br>Max. 40 | Co-funding by UN-SPIDER (US$ 10-15,000 |
| **Seminar** | Small group for intense discussion on a topic. | by UN-SPIDER<br>when needed duration flexible | Experts, usually similar group for a series of seminars<br>Max. 25 | UN-SPIDER or hosting organisation |
| **Workshop - Exercise** | Small group for intense discussion on a topic. | UN-SPIDER with partners<br>Every year, 4-5 days | Technical staff from different backgrounds in selected cases,<br>Max. 30 | UN-SPIDER or hosting organisation |

## V.3 Fund-raising strategies

Fundraising is an essential aspect to ensure the sustainability of capacity-building activities. UN-SPIDER will contact funding agencies on a permanent basis to solicit and secure resources to facilitate its capacity-building activities. A special strategy on this topic will be developed and implemented.

## V.4 SWOT analysis

Taking into consideration the fact that disaster-risk reduction and emergency response are activities coordinated by government agencies, and considering the Hyogo Framework for Action and the establishment of a network of platforms by ISDR, it is essential that UN-SPIDER targets such efforts through the National Platforms for Disaster Reduction promoted by UN-ISDR.

As part of its technical advisory support role, UN-SPIDER will help those government agencies through the conduction of a TAM that should identify **S**trengths, **W**eaknesses, **O**pportunities, and **T**hreats (SWOT Analysis) as an initial step to outline a capacity-building plan for such agencies. As expected, both the National Focal Point and the Regional Support Office in the region where the country is located will contribute to the conduction of this SWOT analysis.

### V.5.1 Individuals

Training efforts targeting individuals will be assembled through a **workplace** training programme that is composed of activities to be completed through e-learning efforts, and complemented with attendance to training courses and workshops. From an organizational point of view, training efforts will be conducted as short term activities, to be complemented with long-terms activities targeting the strengthening of agencies.

### V.5.2 Institutionalizing the use of space-based information

In parallel to the training of individuals, UN-SPIDER will provide policy-relevant advice to agencies regarding how to strengthen their capacities. Taking into consideration lessons learnt from a variety of agencies from developed countries which have provided technical assistance to build capacities, the modality of "twinning efforts" is envisioned by UN-SPIDER to achieve this segment of capacity building. To this end, agencies in developed countries will be approached by UN-SPIDER to assist it the establishment of this "Twinning effort".

### V.5.3 Infrastructure

As a complement to the strengthening of agencies, UN-SPIDER will, when the situation merits, undertake efforts in support of agencies in developing countries to request technical assistance in terms of infrastructure required to access and make use of space-based information to support the full disaster management cycle.

### V.5.4 Plan of Action

The capacity building strategy will be implemented according to a Plan of Action, which will contain the following elements:

| | |
|---|---|
| **Elaboration of Curricula** | To be elaborated with the support of the Expert Group on Capacity Building composed of experts from the network of RCSSTE, Centres of Excellence, and Experts from the Disaster Management / Emergency Response and Space Communities. Elaboration will take into consideration the purpose, the training approach, the different types of target audiences, the learning objectives, and success criteria. Ideally, the curricula should be independent of the mode of implementation |
| **Catalogue of Training Opportunities** | To be set up in the UN-SPIDER Knowledge Portal, and updated on a regular basis, with inputs from partner agencies. |
| **Content** | The Expert Group will review examples of existing content with the purpose of identifying, cataloguing, and indicating how such content should be employed. This task should also help identify gaps in existing material that will need to be elaborated specifically for UN-SPIDER purposes. The selection of content will be based on the type of target group and type of risk in question. The RSOs will provide feedback concerning specific types of contents related to their region. |
| **Blended Learning** | Once content has been gathered and selected for training purposes, the Expert Group will advice UN-SPIDER on which segments should be included in the e-learning component, and which segments will be included in traditional face-to-face courses, short intensive courses (spring and summer schools), and in exercises and workshops. |
| **Elaboration of Training Material** | Once the content material has been classified; UN-SPIDER will proceed to assemble it according to the guidelines of the Expert Group. It is expected that this group will provide suggestions regarding how best make use of existing material. Efforts should be conducted to promote the use of local data and local case studies when elaborating content material to facilitate its understanding by the target audiences. |

| | |
|---|---|
| **Guidelines for the Training Programme** | This segment will target the elaboration of the guidelines regarding the conduction of training activities and complementary efforts targeting the strengthening of agencies. It will include aspects such as admission criteria, registration of practitioners in the training programme, a database to track the progress of practitioners, the schedule of annual training activities, and criteria regarding the evaluation of the progress of participants |
| **Guidelines for Institutional Strengthening** | As it has been stated, UN-SPIDER must complement training efforts via policy advice and twinning efforts to ensure that agencies will be able to relevant make use of the newly acquired skills and knowledge of those staff members trained under the UN-SPIDER programme. In addition, there is a need to facilitate, in the case of specific developing countries, the establishment of infrastructure so that agencies can access and make use of space-based information and space applications to support the full disaster management cycle. To this end, guidelines will be elaborated to provide such complementary assistance to agencies in countries with the support of partners and in line with regional efforts conducted by ISDR and other agencies. |
| **Updates** | Taking into consideration the permanent evolution of methods and tools to access and make use of space-based information to support the full disaster management cycle, the Expert Group will also be requested to continually track such evolution and to indicate to UN-SPIDER which elements should be incorporated into the training programmes and the preferred modalities (e-learning, traditional courses, workshops, exercises). |
| **Translation to other Languages** | Taking into consideration the need to conduct training programmes and capacity-building efforts in other languages such as Spanish and French, UN-SPIDER will make efforts to translate its material into such working languages. Support for such tasks will be requested from agencies in countries where such languages are spoken. |

The Capacity-Building Strategy is summarized in figure 3. The three target groups (Individuals, Institutionalization of the use of information, and Infrastructure) are represented in the top-left area. Short-term goals are presented for or each of these targets, while medium and long-term goals are presented focusing on agencies, organizations, networks, and communities of practice. The lower area of the figure represents the tasks to be conducted through a blended-learning approach, and below the role of Regional Support Offices, National Focal Points and international partners in assisting in the conduction of these capacity building efforts.

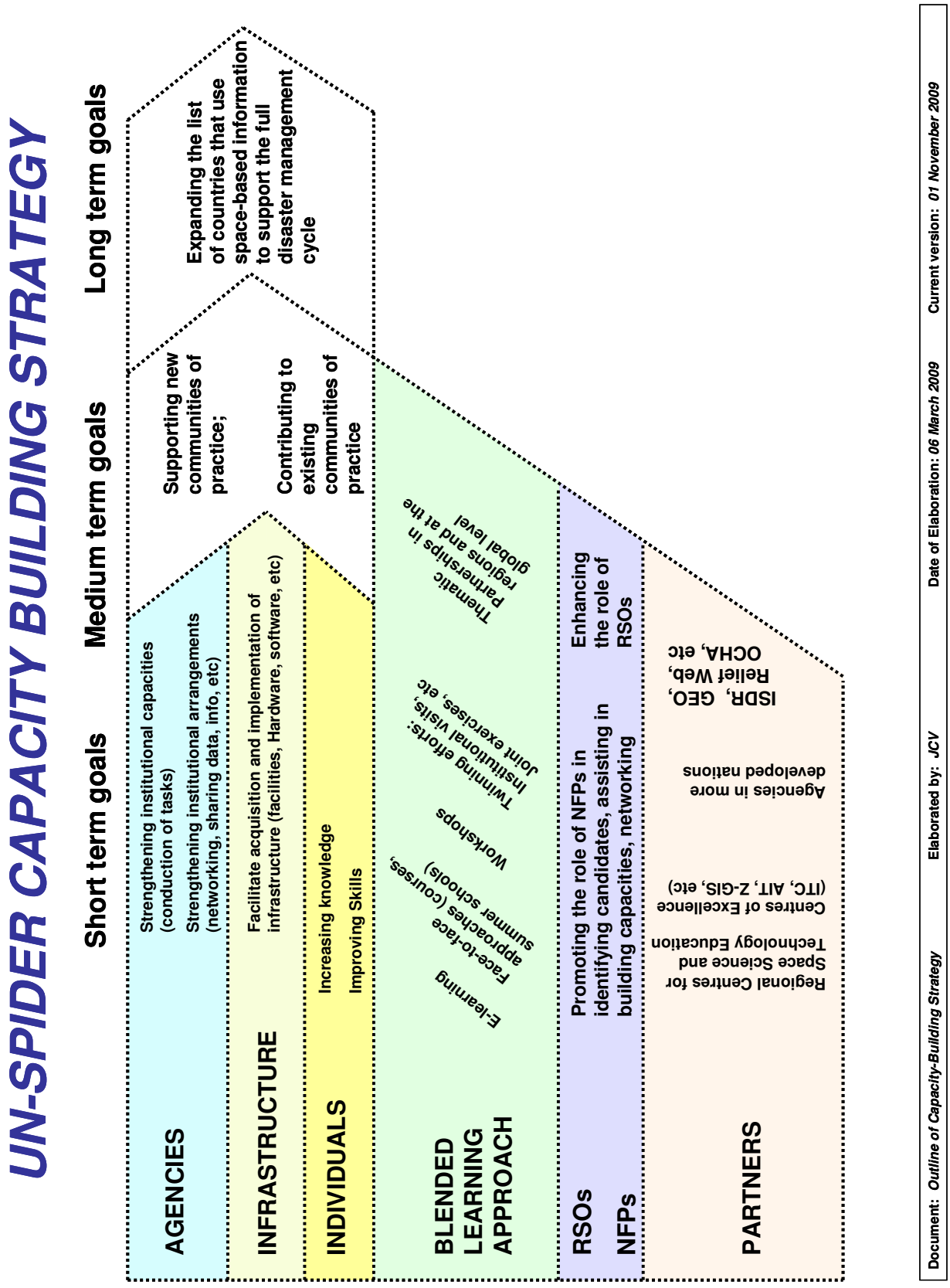


**Figure 3: UN-SPIDER Capacity Building Strategy.**

## VI Monitoring & Evaluation

Monitoring and Evaluation (M&E) are essential processes to assess the degree of progress achieved by UN-SPIDER through the organization of activities regarding the proposed goals set up in this task related to capacity building. Key to M&E is the identification and agreement on indicators of progress and benchmarks that will allow UN-SPIDER to make effective use of these processes.

When defining these indicators, it is important to take into consideration the two required tracks (disaster-risk reduction and emergency response); and the need to focus on individuals, agencies, and on networks or communities of practice. In addition, it is important to recognize outcomes in the short, medium, and long term. For example, while training activities targeting individuals can be accomplished in the short to medium term; strengthening of agencies through twinning and similar efforts require a longer period of time to be accomplished. In addition, while the activities may target audiences at the country level, it is important to keep in mind goals to be reached within UN-SPIDER itself related to networks and communities of practice or partnerships it will establish, as such networks will play a role in developing new ways in which to use space-based information in the context of the disaster-management cycle.

The Kirkpatrick model will be employed to evaluate the training component of the capacity-building efforts to be conducted by UN-SPIDER. Table 2 presents an outline of elements to be considered when designing the M&E process.

**Table 2: Outline of the elements for the UN-SPIDER M&E process.**

| Target | Range | | |
|---|---|---|---|
| | **Short** | **Medium** | **Long** |
| **Individuals** | Training programmes targeting all phases of the disaster-risk management cycle prepared. | Training efforts conducted.<br><br>Assessment of training efforts by individuals participating in the training efforts.<br><br>Assessment of performance of trained individuals through supervisors. | Training efforts validated.<br><br>Assessment of performance of agencies through decision makers.<br><br>Assessment of results through decision makers. |
| **Agencies** | Strategies to institutionalize the use of space-based information designed and elaborated. | Efforts conducted through the proposed twinning approach and through other parallel efforts.<br><br>Assessment of performance of institutions through supervisors. | Agencies institutionalize the use of such information.<br><br>Assessment of performance of agencies through decision makers. |
| **Networks CoPs** | Networks targeting the use of space-based information and services promoted through UN-SPIDER, targeting all phases of the disaster-risk management cycle. | Networks and CoPs collaborate to develop methods and tools to enhance the use of such information and services. | Methods and tools developed through networks and CoPs tested and validated in agencies and organizations. |

Milestones, in the context of UN-SPIDER, will be linked to efforts completed in either regions or continents, for example the translation of training material into other languages such as French or Spanish.

## VII Concluding Remarks

Capacity-building efforts are essential for UN-SPIDER to fulfil its mission. The capacity-building strategy outlined in this document brings forward the need not only to focus on training activities, but also complementary efforts to strengthen agencies, with the aim of improving the quality of the work and the results provided by such agencies in support of the full disaster management cycle.

In its role as a facilitator of capacity building efforts, UN-SPIDER will conduct activities with and through partner agencies such as the network of Regional Centres on Space Science and Technology Education affiliated to the United Nations; other Centres of Excellence; and national and regional training centres which conduct training on topics of relevance to UN-SPIDER.

Taking into consideration the need to work in coordination with other international organizations such as ISDR and GEO; efforts will be conducted to ensure that capacity-building activities are conducted in an efficient way through proper coordination, in order to ensure that no duplication of efforts will take place, and to avoid leaving gaps unattended. Efforts will also be coordinated with other regional disaster management agencies which operate in various continents, such as ADPC, ADRC, CEPREDENAC, CAPRADE, and CDERA; and space agencies from many countries.

Notwithstanding the efforts of UN-SPIDER and other international and regional organizations, it is important to recognize that capacity building is the responsibility of agencies in developing countries and not one of UN-SPIDER. Long-term success will only be achieved if national agencies requesting the assistance of UN-SPIDER make the commitment to change their procedures, and if governments are willing to support such efforts, particularly through the recognition of the relevance and importance of using information to make decisions, and recognizing the value of trained individuals when it comes to accessing and processing information for such purposes.

The topic of the use of space-based information and space applications to support the full disaster management cycle is still in development, and is continually changing as new technologies and tools become available. Thus, it is imperative that UN-SPIDER also keeps updating its capacity-building efforts to provide developing countries with the most modern and efficient tools to support the full disaster management cycle as a means to support these countries in achieving sustainable development.