



UNITED NATIONS  
Office for Outer Space Affairs

## **Final Workshop Report**

**Regional UN-SPIDER Workshop:  
“Space-based Applications for Managing Risk Reduction and Emergency  
Response in Latin America”**

**Organized by**

**United Nations Office for Outer Space Affairs  
(UNOOSA)**

**and the**

**National Secretariat for Risk Management of Ecuador**

**With the support of  
The Government of Ecuador  
Pro-Tempore Secretariat, Space Conference of the Americas  
The Government of Spain  
and the United Nations Environmental Programme (UNEP)**

**Quito, Ecuador, 29 September to 2 October 2009.**



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## **Acknowledgements**

The UN-SPIDER programme wishes to thank all members of the Organizing Committee for their support and dedication in the conduction of this regional workshop. Similarly, UN-SPIDER would like to acknowledge the support provided by the Government of Spain and the Government of Ecuador that enabled the realization of this event which has served to promote UN-SPIDER in Latin America. Finally, UN-SPIDER would like to express its gratitude to all presenters, panelists, moderators, and participants for their contributions, which were essential to reach the proposed results.

## **I. Background**

Between 29 September and 2 October 2009, the regional UN-SPIDER workshop for Latin America was held at the Grand Hotel Mercure Alameda in Quito, Ecuador. With more than 60 representatives from 17 countries, the workshop included a series of presentations in plenary sessions, a panel of experts, group discussion sessions, and cultural events.

An Organizing Committee was established to plan, coordinate, and conduct the workshop. The Committee included representatives of the UN-SPIDER programme, the National Secretariat for Risk Management of Ecuador, the National Institute of Aerospace Technology of Spain, the Pro-Tempore Secretariat of the Space Conference of the Americas, and the United Nations Environmental Programme (UNEP). Within Ecuador, the following agencies participated in the Organizing Committee: the Ministry of Foreign Affairs, Trade and Integration, the Air Force, the Center for Integral Surveys of Natural Resources using Remote Sensing, the National Institute for Meteorology and Hydrology, the Ministry of Agriculture, Food, and Fishing, and the National Oceanographic Institute of the Naval Forces. In addition, within Ecuador, a national, inter-institutional committee was established to support planning and conduction of the workshop.

Taking into consideration the guidelines of the UN-SPIDER programme, the workshop was planned with the following goals:

- To continue outreach activities with the goal of establishing a network of operators and users in Latin America.
- To identify ways to bridge the gap between the space and the disaster management communities.
- To identify ways and mechanisms to support countries in the region, using Ecuador as a starting point.
- To obtain consensus on capacity building strategies in Latin America on the issue of space-based applications for disaster-risk management and disaster response.

The proposed results were:

- To gather elements to elaborate an Action Plan to harmonize institutional relations and regional capacity building.
- To receive guidance on the use of space-based applications in the event of natural disasters and environmental hazards which manifest in Latin America, using the case of Ecuador as an example.

To achieve the goals and proposed outcomes, an operational structure for the workshop was set up combining presentations and panels during plenary sessions and group sessions to discuss specific issues that the Organizing Committee had identified as relevant. The proposed outline for the workshop is shown in Annex 1. The identification and subsequent selection of speakers and topics for discussion in group sessions were done by the Organizing Committee.

The workshop brought together experts from the space community, the disaster-risk management community and from various development sectors (planning, education, health, science and technology, etc.). Hence, the workshop met the goal of UN-SPIDER to bring together representatives of the space community with representatives from both civil protection and disaster response in the Latin American region. More information about this workshop and the UN-SPIDER program can be found at the following websites:

<http://www.un-spider.org>

<http://www.unspider.org>

## II. Participants

The workshop brought together more than 60 representatives from various institutions in 17 countries in Europe, Latin America and the Caribbean: Mexico, Guatemala, Costa Rica, Cuba, Dominican Republic, Venezuela, Colombia, Peru, Ecuador, Bolivia, Chile, Argentina, Uruguay, Brazil, Spain, Germany, and Austria.

On behalf of the United Nations, the workshop was attended by experts from the Intergovernmental Oceanographic Commission of UNESCO (IOC-UNESCO), the International Strategy for Disaster Reduction (ISDR), the World Food Program (WFP), the United Nations Development Programme (UNDP), the International Centre for Research on El Niño (CIIFEN), the Regional Centre for Space Science and Technology Education for Latin America and the Caribbean (CRECTEALC) and the UN-SPIDER Programme. It was also attended by representatives of the International Charter: Space and Major Disasters ( a mechanism established by space agencies around the world).

In addition, officials from various regional organizations were present such as the Pan American Institute of Geography and History (PAIGH), the Coordination Center for Natural Disaster Prevention in Central America (CEPRENAC), the Andean Committee for Disaster Prevention and Response (CAPRADE), the Central American University Superior Council (CSUCA) and the Ibero-american Science and Technology for Development Program (CYTED).

The event brought together representatives from various space agencies: the Institute for Aerospace Technology of Spain (INTA), the Institute of Space Research of Brazil (INPE), the National Commission on Space Activities of Argentina (CONAE), the Bolivarian Agency for Space Activities (ABAE), the Ecuadorian Space Agency (ESA, currently in the process of being legalized) and the German Aerospace Center (DLR).

The event benefited from the participation of experts from Spain who represented the following institutions: the Institute of Aerospace Technology of Spain (INTA), the National Geographic Institute, the University of Nebrija and private companies such as GMV Aerospace and Defence S.A. and INFOCARTO.

The academic sector was represented by participants of the Technological Institute of the Americas in the Dominican Republic (ITLA), the National University of Colombia in Medellin, the Geophysical Institute of Ecuador's National Polytechnic Institute, the Polytechnic School of the University of Sao Paulo, the University of Nebrija, the National Autonomous University of Havana in Cuba, and the Central American University Superior Council (CSUCA) based in Guatemala.

In the area of civil protection or civil defense, the workshop benefited from the presence of representatives of the National Secretariat for Risk Management of Ecuador (SNGR), the National Emergency Office of the Ministry of Interior of Chile (ONEMI), the Risk Management Division of the National System for Disaster Prevention of the Ministry of Interior and Justice of Colombia (DGR), the Civil Defense of the Dominican Republic and the National Civil Protection Directorate of Venezuela.

Other organizations that participated in the event were: The National Center for Disaster Prevention (CENAPRED) and the National Institute of Statistics, Geography and Informatics (INEGI) of Mexico, the National Meteorological Institute of Costa Rica, the Vice Ministry of Lands of Bolivia, the Land Management Program of the Ministry of Housing, Construction and Sanitation of Peru and the National Directorate of Environment of Uruguay (DINAMA).

In the case of Ecuador, representatives of following institutions participated in the workshop: the Ministry of Education; the National Secretariat of Planning and Development (SENPLADES); the Center for Integral Surveys of Natural Resources using Remote Sensing (CLIRSEN); the Ecuadorian Air Force (FAE); the Military Geographical Institute (IGM); the Ministry of Foreign Affairs, Trade and Integration; the Ministry of Health; the National Geological Survey; the Ministry of Agriculture, Livestock,

Aquaculture and Fisheries (MAGAP); the Municipal Government of Quito; the National Institute of Meteorology and Hydrology (INAMHI); the National Institute of Cultural Heritage (INPC); the Ministry of Public Works and Transportation; the Public Petrol Company of Ecuador (Petroecuador); the Oceanographic Institute of the Naval Forces (INOCAR); the National Telecommunications Council; the Regional Sub-Secretariat of Healththe Association of Ecuadorian Municipalities; and the General Directorate of National Sovereignty of the Ministry of Foreign Affairs, and the Pro-Tempore Secretariat of the V Space Conference of the Americas.

The list of participants is available at the following website:

[http://www.unoosa.org/pdf/unspider/Directorio\\_Taller\\_Ecuador\\_2009.pdf](http://www.unoosa.org/pdf/unspider/Directorio_Taller_Ecuador_2009.pdf)

It is important to emphasize that the financial support provided by the Government of Spain and the financial resources provided by the UN-SPIDER programme facilitated the participation of 26 participants from Latin America and Europe, **22 of whom came from developing countries** in Latin America and the Caribbean.

### III. Inauguration and Plenary Presentations

The inauguration of the workshop was conducted by the following authorities:

- Dr. Maria del Pilar Cornejo, National Secretariat for Risk Management in Ecuador.
- Vice Chancellor July Oleas, Ministry of Foreign Affairs, Trade and Integration of Ecuador. Ambassador Jaime Barberis, Secretariat Pro Tempore of the Space Conference of the Americas. Dr. Federico Torres, Ambassador of Spain.
- Colonel Fernando Medina, Ecuadorian Air Force.
- Dr. Juan Carlos Villagrán de León, UN-SPIDER.

Keynote addresses were made by Dr. Cornejo, Vice Chancellor Olea, and Ambassador Torres. In their speeches, Dr. Cornejo, Vice Chancellor Oleas and Ambassador Torres emphasized the need to focus efforts on the topic of risk management and the need to integrate this issue with climate change as a strategy to promote sustainable development.

The 21 plenary presentations covered four main topics:

- **Recent advances in space-based applications for risk assessment and for disaster response in Europe and in Latin America.**
- **Use of space-based technologies in early warning.**
- **Mechanisms for information dissemination and regional capacity building.**
- **Harmonization of institutional initiatives.**

Nine of these presentations focused on activities and programs implemented by regional and international bodies including a general presentation about the UN-SPIDER programme.

Several presentations concentrated on the most recent advances in applications of space-based technologies all phases of the cycle of disasters. Six presentations from experts of various institutions of Ecuador presented examples concerning the use of these technologies in a variety of topics, and one presentation was made on the National Secretariat for Risk Management by its Director, Dr. Maria del Pilar Cornejo.

Table 1 provides a breakdown of the presentations made by representatives of various institutions. The presentations are available at:

<http://www.unoosa.org/oosa/en/unspider/ecuador2009.html>.

**Table 1: Institutions that made presentations in plenary sessions**

<b>Regional and International Entities</b>	<b>Spain</b>	<b>Ecuador</b>
UN-SPIDER	INTA	SNGR
EIRD	National Geographic Institute	FAE
UNESCO	GMV Aerospace and Defense S.A.	SNIT – SENPLADES
PNUMA	University de Nebrija	Geophysical Institute, IPN
CHARTER	INFOCARTO	SEGENA
CIIFEN		INOCAR
IPGH		INAHAMI
CRECTEALC		MAGAP
CYTED – Red UTEEDA		CLIRSEN

Furthermore, the Ministry of Foreign Affairs, Trade and Integration of Ecuador moderated a panel where representatives from space agencies of Argentina, Brazil, Venezuela, Germany and a representative from INEGI of Mexico commented on the type of space-based information which is available for a variety of uses.

The panelists commented regarding experiences in the use of such information and provided suggestions for promoting its use in the region. They emphasized the need to recognize the value of space-based information and that this value be recognized by institutions and organizations engaged in all phases of the disaster cycle the same way as they recognize the value of computer equipment and software for example. Similarly, they motivated participants to recognize the utility of using historic archives to assess changes and processes over time and not only to focus on the latest satellite imagery for example. The panel highlighted the interest of developing countries in finding more agile cooperation mechanisms to access space-based information required for disaster-risk management at affordable costs.

#### **IV. Discussion Sessions**

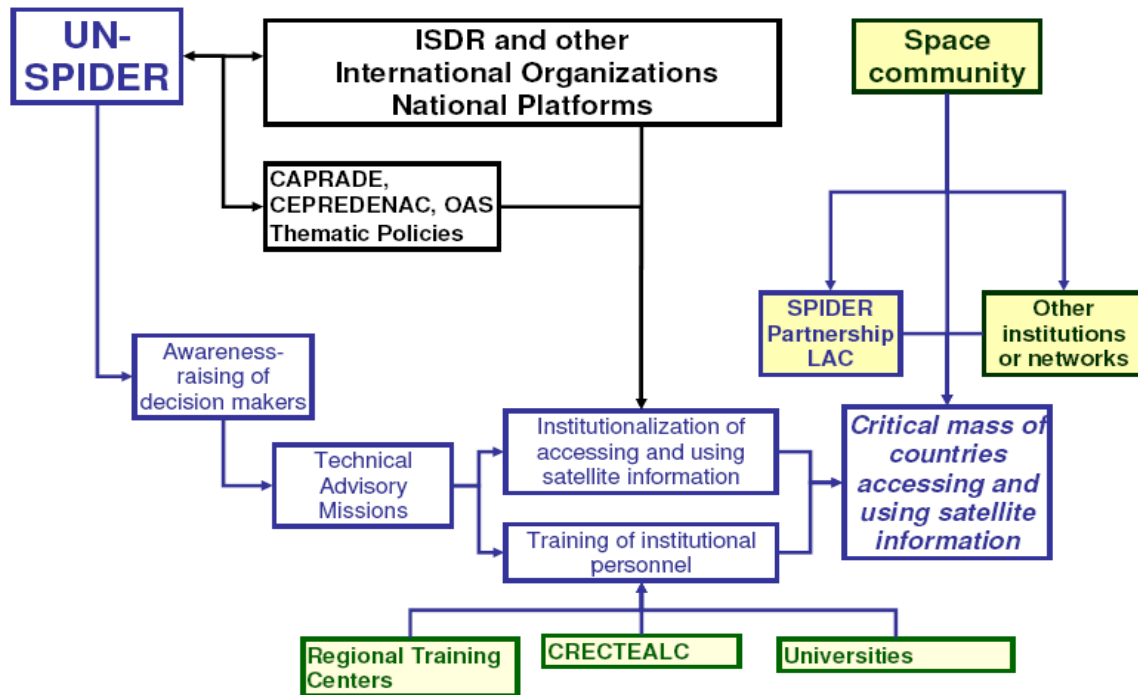
The Regional UN-SPIDER Workshop for Latin America spanned four discussion sessions in which participants provided inputs as a basis to:

- Optimize the technical advice to be provided by UN-SPIDER on a national level.
- Develop an Action Plan for Latin America.
- Implement the SPIDER Thematic Partnership for Latin America.

The discussion sessions took place within the framework presented in Figure 1 which positions UN-SPIDER, the International Strategy for Disaster Reduction and other international agencies such as CIIFEN and the Space Community in a global context and the Organization of American States, CAPRADE and CEPREDENAC in a regional context.

Considering the mission of UN-SPIDER, it can be deduced that the objectives will be accomplished at the national level when countries possess a critical mass of experts and professionals who have the ability to access and use space-based information to support all activities within the disaster cycle. In this regard, the UN-SPIDER programme must carry out a chain of activities that begins with the awareness of decision makers in the countries before conducting technical advisory missions and capacity building efforts that will serve to establish such a critical mass. To this end, UN-SPIDER must harmonize its efforts with other international and regional organizations such as CIIFEN, CEPREDENAC, CAPRADE, other regional organizations, and the space community.

**Figure 1: Conceptual framework for the discussion sessions**



The support of ISDR and other organizations in the United Nations System as well as regional bodies like the Organization of American States (OAS), PAIGH, CAPRADE, CEPREDENAC and the like is essential to institutionalize access and subsequent use of space-based information to support all phases of the disaster cycle through policies and transformation processes to be stimulated in an integrated way.

In a similar way, the harmonization of efforts with these organizations is foreseen in processes targeting capacity-building. In the UN-SPIDER Capacity Building Strategy, this strengthening of capacities includes three processes:

- Institutionalization of the use of such information.
- Training of staff in institutions to be conducted by CRECTEALC and several regional centres and universities.
- Facilitating access to necessary infrastructure in order to access and subsequently use such information (hardware and software).

The information obtained from satellites is generated by the space community and is distributed to practitioners and experts in the countries directly or through other institutions and networks, including the SPIDER Thematic Partnership for Latin America and the Caribbean.

The discussion sessions focused on four aspects that are relevant in the planning of activities by UN-SPIDER and the SPIDER Thematic Partnership for Latin America and the Caribbean:

**Policies** to institutionalize access to and use of space-based information to support all phases of disasters, and to ensure that there are professionals who can establish this critical mass at all times through training and institutional strengthening.

**Harmonization** of efforts with other international organizations (ISDR, OCHA, UNEP, CIIFEN, etc.), regional agencies (OAS, CAPRADE, CEPREDENAC, GEO, SERVE-

CATHALAC, etc.) and national institutions (civil protection entities, national space agencies, etc).

**Sustainability** of efforts at the international, regional and national level and regarding resources (human, infrastructure, financial).

**Capacity Building** through a network of regional centers (CRECTEALC, Gulich Institute, SERVIR-CATHALAC) and national institutions (universities, national training centers).

### Main conclusions from the participants in the groups sessions

1. Participants noted that there are different degrees of progress at the institutional level in countries of the region around the “space” topic, particularly on the use of such information to support various phases of the disaster cycle.

Countries like Germany, Spain, Argentina and Brazil have a long trajectory in this subject, with space agencies having promoted strong programs that focus on applications, including institutional research programs on the use of this type of satellite information for various purposes. Other countries like Colombia, Chile, Peru, and Venezuela already established space agencies which are promoting a variety of activities, whereas in Mexico and Ecuador such agencies are currently being established. In other countries the level of use of this information varies, although there are no national space agencies or research institutes in place that focus on this issue explicitly.

Table 2 provides a brief breakdown of space agencies and civil protection entities according to information provided by the participants of the workshop.

**Table 2: Space Agencies and their links with civil protection institutions in several countries (Source: data provided by participants at the workshop)**

Country	Space Agency	Agency manage satellite data	Civil Protection
Argentina	CONAE		CONAE provides such information to various institutions.
Brazil	AEB	INPE conducts research and supports efforts in this area	In some provinces civil protection or civil defense agencies maintain contact with INPE.
Mexico	Non existent	INEGI	The National Civil Protection System seeks information from various sources and then processes it.
Ecuador	CEE, being set up	SNR	Technical Secretariat for Risk Management.
Colombia	CCE	Inst. Agustín Codazzi	The National System for Disaster Prevention and Attention has had little relation to the CCE regarding disasters.
Chile	ACHE		National agency in charge of management of space-based information. ONEMI seeks information from various sources and then processes it.
Spain	Non existent	INTA is dedicated to research, it provides information to civil protection	Civil Protection seeks information from various sources and then processes it.
Peru	CONIDA		Several institutions in the country make use of this information.
Germany	DLR		DLR provides information to various institutions in the disaster community.

2. Participants highlighted the links which exist between these agencies for the provision of space-based information to support the various phases of the disaster cycle. As can be seen, some countries have established national research centers that conduct research on the use of such information for various purposes. Similarly it can be seen that in other countries the space agency provides direct links to the national protection agencies or civil defense institutions to provide such information.

3. In addition, participants emphasized the need for UN-SPIDER to take into consideration existing regional bodies such as the Organization of American States (OAS), the Pan American Institute of Geography and History (PAIGH), the Andean Committee for Prevention and Disaster (CAPRADE), the Coordination Center for Natural Disaster Prevention in Central America (CEPREDENAC) as well as national bodies that exist in all countries of the region.

The particular case of disaster response was explicitly highlighted through a presentation of the CHARTER to illustrate how this mechanism established by the space agencies supports emergency operations centers free of charge when a disaster occurs.

The following sections present the results of the discussion sessions and include a specific section on the SPIDER Thematic Partnership for Latin America and the Caribbean.

## **SESSION 1: POLICIES**

Within the scope of policies, efforts should target the generation of the critical mass of professionals and experts which have the responsibility to accessing and using space-based information to support all phases of disasters. Two processes contributing to this end are:

- The institutionalization of this process of access and use of information and
- The training of staff in institutions.

The main recommendations made during the workshop are:

### **1 Take into account existing policies at regional and national levels:**

Policies and existing international agreements such as the *Hyogo Framework for Action* of ISDR and those already established at the regional level such as the *Andean Strategy for Disaster Prevention and Response* and the *Regional Plan on Disaster Reduction 2006 – 2015 for Central America* in the scope of CEPREDENAC should be taken into consideration.

In addition, it is important to take into consideration policies, laws, norms and strategies that have been established in each country in the field of risk management and disaster response.

### **2 Promote policies that encourage the use of space-based information to support the entire cycle of disasters.**

Policies that foster the use of this kind of information should be promoted in those countries that do not yet contemplate such policies. In countries that already have policies in place regarding integrated risk management and disaster response but do not yet consider the use of satellite information for that purpose, the incorporation of these policies should be promoted as well.

*It is important to enhance telecommunications to access this type of information.*

*It is important to promote access to this type of information.*

*It is important to promote the use of such information.*

*It is important to incorporate the issue of sustainability in such policies.*

## **SESSION 2: HARMONIZATION OF EFFORTS**

In the context of harmonization of efforts it is important to take into consideration both the efforts being conducted at different levels and the targeting the different phases of disasters.

On the one hand, it is important for UN-SPIDER to harmonize its efforts with other international entities in the United Nations system, including ISDR and CIIFEN, the space community, as well as with regional bodies like the OAS, PAIGH, CEPREDENAC and CAPRADE to promote the institutionalization of the use of information. Similarly, UN-SPIDER should harmonize its efforts with training centers at national, regional and international levels to optimize workplace learning processes in institutions to shape the proposed critical mass.

In parallel it is important for UN-SPIDER to harmonize its efforts with the space community and existing networks to provide support to the critical mass in countries. In this regard:

*It is important to harmonize efforts with regional and international actors.*

*It is important to harmonize efforts with National Platforms for Disaster Reduction, with technical and scientific institutions and with the Ministries of Foreign Affairs.*

*It is important to harmonize supply and demand of space-based information.*

*It is important to promote regional standards to facilitate interoperability.*

*It is important to promote research in this field.*

*It is important to promote training programs.*

## **SESSION 3: SUSTAINABILITY OF EFFORTS**

In the area of sustainability of efforts the issue is to ensure the operability of the critical mass of professionals and experts on a permanent basis, which means ensuring human, financial and infrastructure resources. As it has been stated by one of the groups: *“dedicated actions are necessary to achieve it and resources (human, structural, financial) to maintain it.”*

During the discussion sessions, participants identified several strategies to promote sustainability of such efforts such as:

- Ensuring that the results obtained using this type of information are tailored to the needs or demands of National Platforms for Disaster Reduction.
- Linking efforts to other equally important goals such as climate change, food security, and human security.
- Demonstrating the benefit to be obtained when using space-based information (cost / benefit). The use of such information improves efficiency, increases the scientific and technical basis and in innovative action procedures, which is important to facilitate the sustainability of risk management efforts.
- Involving the productive sector in countries.
- Linking efforts with international commitments.

The main recommendations identified during the workshop were:

### **1 Sustainability through relevance and pertinence:**

*It is important to strengthen the value chains (need - demand - sustainable consumption).  
It is important to unify efforts when dealing with problems which are common in the region (climate change, food insecurity, drought, etc.).*

## **2 Taking advantage of emerging opportunities to enhance sustainability:**

*It is important to take advantage of opportunities which arise nationally, regionally and internationally.*

## **3 Securing the necessary resources:**

*It is important to promote investment in the use of such kind of information to support all phases of the disaster cycle.*

*It is important to recognize the need for sustainability of efforts in capacity building*

## **SESSION 4: TRAINING**

As mentioned earlier, training should aim to increase knowledge and skills to access and use space-based information. In this regard, efforts conducted by UN-SPIDER must complement those which are carried out by international agencies and by the space community. The mandate given to UN-SPIDER by the United Nations General Assembly stipulates that UN-SPIDER should facilitate these training efforts by making use of centers of excellence at international, regional, and national levels. In the area of training, participants identified several strategies such as:

- Making use of existing national, regional and international training programs.
- Promoting the use of satellite information covering all phases of the disaster cycle.
- Making use of various learning formats including e-learning.
- Ensuring interfaces with institutions devoted to the promotion of knowledge, training, development of science and technology policy and innovation (National S&T councils, university associations, etc.).

The main recommendations on this issue are:

### **4 Training programmes:**

- *It is important to institutionalize and strengthen such programs.*
- *It is important to unify efforts when working at regional level.*
- *It is important to promote e-learning.*

## **SESSION: THE SPIDER THEMATIC PARTNERSHIP FOR LATIN AMERICA AND THE CARIBBEAN**

One of the goals of the workshop was to discuss and gather feedback concerning the implementation of a regional network in the context of the SPIDER Global Thematic Partnership which was launched by UN-SPIDER during the second meeting of the Global Platform for Disaster Reduction held in June 2009 in Geneva, Switzerland.

The following recommendations on this partnership can be deducted from the discussion sessions:

- The partnership should promote the use of all types of space applications to support all phases of the disaster cycle (satellite imagery and remote sensing, global ge positioning GPS and GNSS, satellite telecommunications)
- The partnership should involve representatives of institutions from multiple types of sectors: space agencies, civil protection or civil defense agencies, institutions of development sectors, universities, training centers and research institutions.

- The partnership should focus its efforts on supporting institutions in the countries to solve pressing problems related to risk management and emergency response. In this regard, one of its first tasks should be to analyze how space-based information offers relevant and pertinent solutions as well as the cost / benefit relation regarding the use of such information.
- The partnership must harmonize its efforts with other networks and regional and international organizations present in the region and interact with space agencies and other international organizations around the world which have an interest in supporting efforts in the region.
- The partnership needs to have well-established partners at the national level and should channel its efforts through the National Platforms for Disaster Reduction. It is important for the partnership to design products and programs with a focus on the end-user (the recipient and the user of the information). It is important to reach these end users.
- The partnership should facilitate horizontal cooperation between countries to facilitate access and subsequent use of space-based information to support all phases of the disaster cycle.
- It is important that the partnership facilitates procedures to achieve common standards for metadata, taxonomies and the use of common terminology in the region. The partnership should also consider establishing a working relationship with the SDIs and other regional networks to facilitate access to data in a bidirectional way.

Among the specific activities that were outlined during the discussions, the following can be highlighted:

- Analyze policies and regional strategies driven by various regional and international bodies to determine the best ways to adjust to these policies and adopt such strategies.
- Derive the cost / benefit relation of using space-based information as an initial strategy to promote the use of such information. Demonstrate the usefulness of products that have been developed using such information. Specify the economic and social impacts that the use of such information offers.
- Consider the establishment and operation of a monitoring system of technologies and methodologies being developed globally and the respective analysis of the feasibility of their use in the region.
- Rely on information and communication technologies (ICTs) to disseminate and store the knowledge in digital media.
- Identify, systematize and catalog existing practices in the region, with the goal of promoting the best practices.
- Develop an inventory of information on satellites and sensors that cover the region.
- Develop a catalogue of examples of applications.
- Analyze the most viable forms of aligning its products with other regional initiatives such as SERVIR and SIAPAD.
- Establish mechanisms for coordination with national, regional and international training centers on space matters which are oriented towards risk management and disaster response.
- Take up efforts to articulate information on each country and to compile and disseminate it.
- Identify and catalog training materials in various languages. Translate to Spanish those that are considered relevant and pertinent.

## Synthesis of the Sessions

	GOVERNANCE	HARMONIZATION	SUSTAINABILITY
<b>POLICIES</b>	Promote policies which encourage the use of space-based information in all phases of the disaster cycle.	Promote policies at the regional level with respect to norms and standards with respect to the use of space-based information to encourage interoperability within the region.	Promote policies that encourage the involvement of the productive sector in these types of activities.
<b>STRATEGIES</b>	Take into consideration existing policies at the regional and national levels.	<p>UN-SPIDER should harmonize its efforts with those of other regional and international agencies.</p> <p>UN-SPIDER should focus its efforts at the national level to target the National Platforms for Disaster Reduction.</p> <p>UN-SPIDER should harmonize its efforts with training centers operating in the region.</p>	Link efforts targeting disaster-risk reduction with other relevant topics such as climate change and food security.
<b>ACTIONS</b>	<p>UN-SPIDER should analyze existing policies to identify optimum ways in which to design its support at the national and regional levels.</p> <p>Establish the SPIDER Thematic Partnership for Latin America and the Caribbean with well-established partners at the national level</p>	<p>Facilitate the conduction of training programs in Latin America and the Caribbean by existing training centers operating in the region.</p> <p>Establish the SPIDER Thematic Partnership for Latin America and the Caribbean as a mechanism to promote achieve common standards in the region.</p> <p>UN-SPIDER should harmonize its information products with regional initiatives such as SIAPAD and SERVIR.</p>	<p>Conduct studies to demonstrate the cost/benefit relation regarding the use of space-based information in the context of disaster-risk reduction and emergency response.</p> <p>Establish the SPIDER Thematic Partnership for Latin America and the Caribbean as a mechanism to systematize and catalog existing practices in the region, with the goal of promoting those that merit such promotion.</p>

## V. Results

The workshop in Ecuador has enabled the UN-SPIDER programme to:

- Continue its outreach activities with the goal of establishing a network of operators and users in Latin America.
- Identify ways to bridge the gap between the space community and the risk reduction and disaster response community.
- Identify ways and mechanisms to support countries in the region, using Ecuador as a starting point.
- Obtain consensus on capacity building strategies in Latin America on the issue of space applications in risk reduction management and disaster response.

In terms of results, the workshop facilitated the UN-SPIDER programme to:

- Collect Country Profiles from participants of six countries that describe the level of advancement in the use of such information in the country (Guatemala, Dominican Republic, Colombia, Peru, Venezuela and Costa Rica)
- Obtain inputs for the Technical Advisory Mission to be conducted in Ecuador during the week following the workshop.

- Continue planning the Technical Mission to be conducted in the Dominican Republic, and initiate efforts to conduct out similar missions in Colombia, Venezuela and Guatemala.
- Identify ways to conduct joint activities with ISDR, CIIFEN, CRECTEALC, CEPREDENAC, CONAE, PAIGH and other regional organizations.
- Obtain inputs for similar regional workshops in Africa and Asia.

## **VI. Future Activities**

In terms of activities emanating from the workshop, a capacity-building program for Project Managers in Central America and the Caribbean in the context of the CHARTER was outlined with CONAE. The workshop will be coordinated in the region with the support of CEPREDENAC.

In parallel, discussions were conducted regarding a regional follow-up activity in Mexico taking into account the conduction of the Sixth Space Conference of the Americas.

An initiative arose within the workshop to motivate the space agencies of the region to concretize a regional training program for staff of the Ministries of Agriculture of the countries in the region focusing on the use of this information to estimate crops and the impact of droughts and other events may impact such crops and their relation to food security or insecurity.

## **VII. Final Comments**

With the support of various institutions, the regional workshop in Ecuador has allowed the UN-SPIDER programme to advance its agenda in Latin America as well as at the global level. The results obtained through the discussion sessions will find their application in the work program for Latin America and in the thematic partnership which will be launched by UN-SPIDER for this region in the near future.

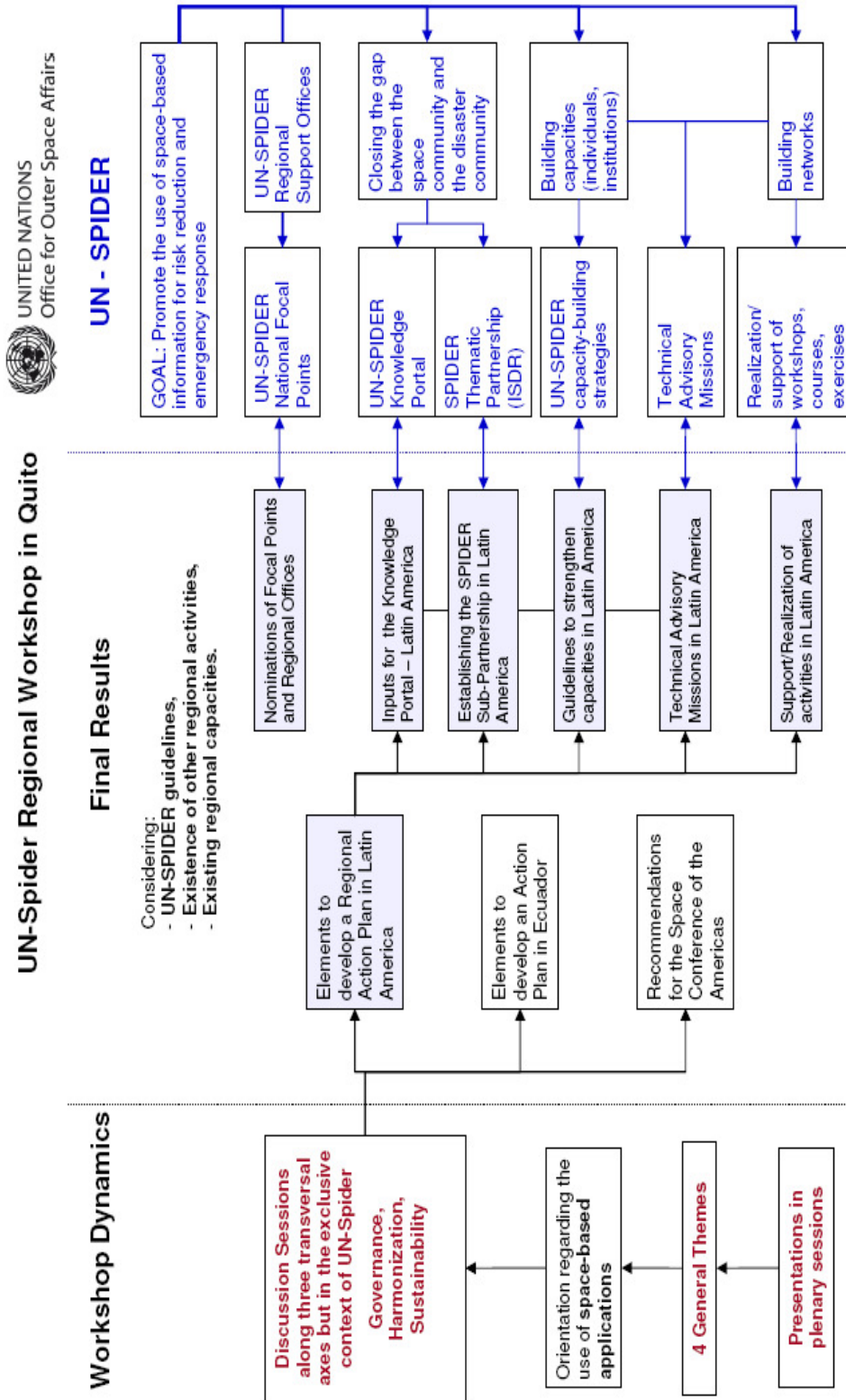
In the context of the Workplan endorsed by the UN General Assembly for the biennium 2008 - 2009, the workshop has facilitated the planning and subsequent implementation of technical missions to countries of this region. The first mission undertaken in Latin America will be carried out one week after the workshop in Ecuador. In this regard, presentations by experts from Ecuador have provided high-value inputs to the experts who will carry out this mission. Similarly, the workshop provided an opportunity to discuss the details for carrying out the next mission in the Dominican Republic.

In parallel, the workshop provided an opportunity to receive National Country Profiles of six countries which will serve to specify a baseline at the regional level regarding the use of such a type of information to support all phases of the disaster cycle.

In the context of activities to be conducted by UN-SPIDER, the workshop results will find their place in the following events:

- The meeting of the Scientific and Technical Sub-Committee of COPUOS in February 2010.
- The regional UN-SPIDER workshop in Africa, to take place in April 2010.
- The Spring School to be held by CRECTEALC and CONAE which focuses on the issues of drought and desertification.
- The meeting of COPUOS to take place in June 2010.
- UN-SPIDER International workshops in Vienna and Bonn during the year 2010.

# Annex 1: Scheme of the Workshop



## Annex 2: Workshop Evaluation

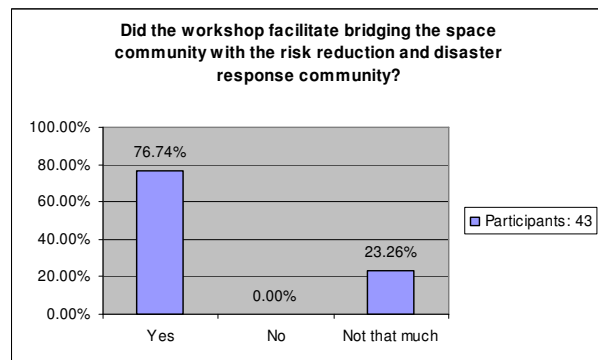
On the last day of the workshop, participants were asked to evaluate the quality of the workshop. The results are presented below:

The first question covered three aspects. The first aspect focused on the effectiveness of the workshop in offering participants orientations on the use of space-based applications in case of disasters and environmental hazards.

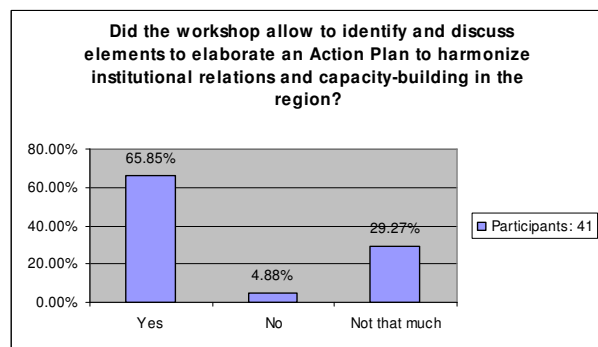
As shown in the graph, it can be concluded that the workshop was highly effective in this regard.



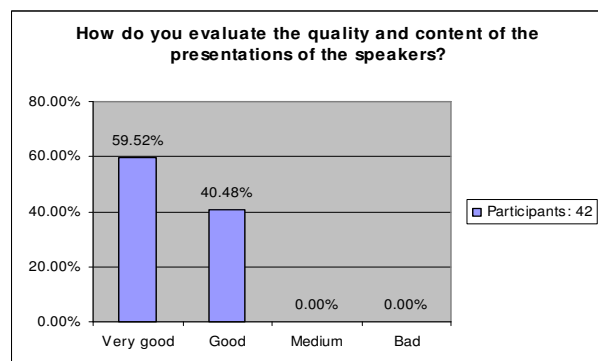
The second aspect considered in Question 1 was the effectiveness of the workshop in terms of bridging the space community with the risk reduction and disaster response community. The graph indicates that despite the positive results, there is room for improvement in this aspect.



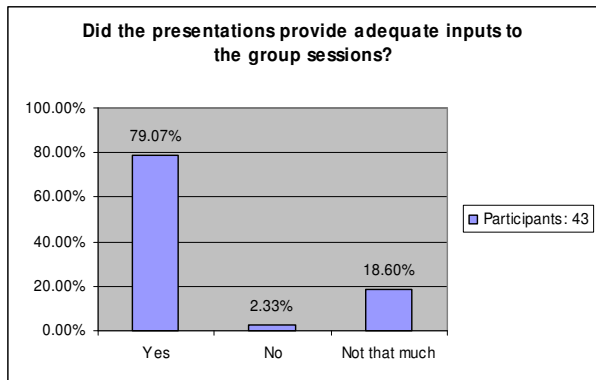
The third aspect considered in question 1 evaluated the effectiveness of the workshop in identifying and discussing elements to elaborate an action plan. 66% of the participants replied positively, whereas 34% answered negatively.



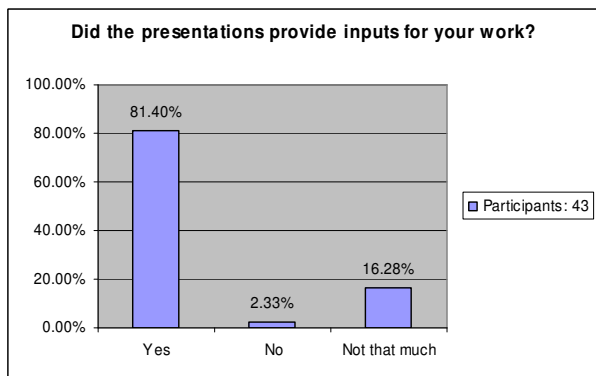
The second question focused on the quality of the plenary presentations made by the speakers. As can be observed, the participants assessed these in a very positive way.



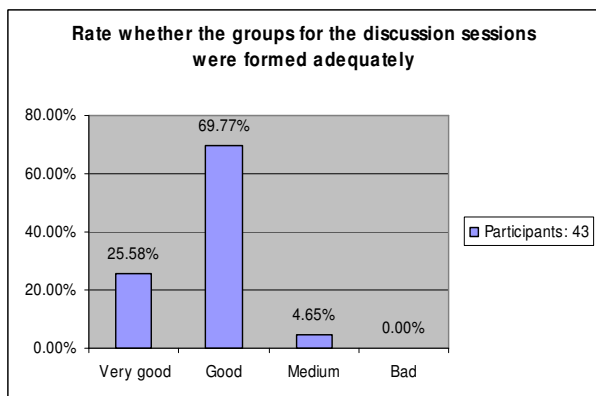
Regarding the third question, it can be concluded that approximately four out of five participants thought that the plenary presentations gave adequate inputs to the discussion sessions.



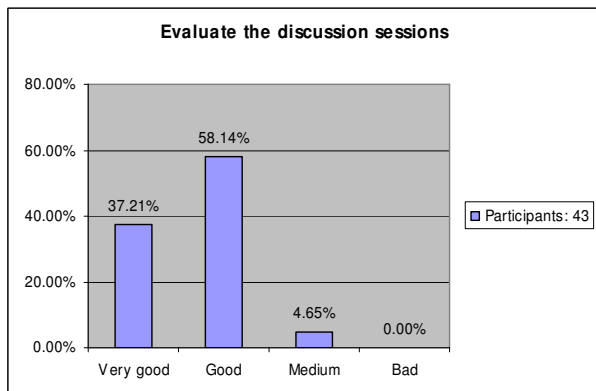
The fourth question focused on the possible usefulness of the plenary presentations for the daily work of the participants. As in the previous question, four out of five participants concluded that the presentations provided inputs for their own work.



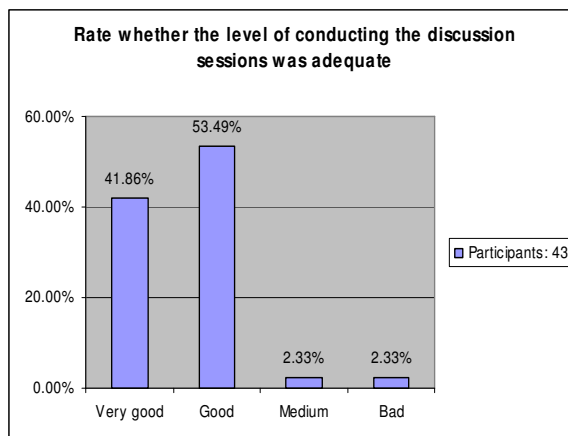
Taking into consideration that the working groups were defined according to the instructions of the organizing committee, it was considered important to also seek the views of the participants in relation to this strategy of explicitly forming groups. The results of the chart confirm that the participants evaluated the formation of the groups that arose in the discussion sessions very positively.



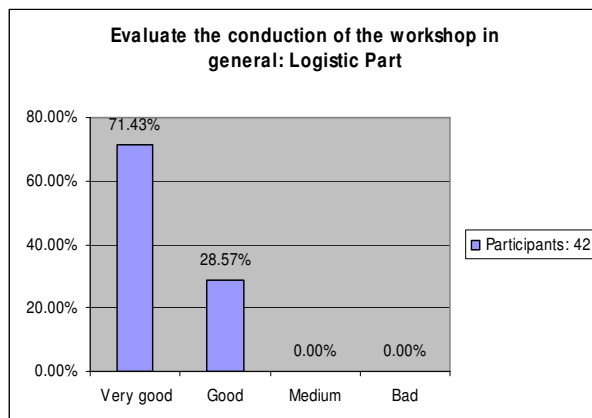
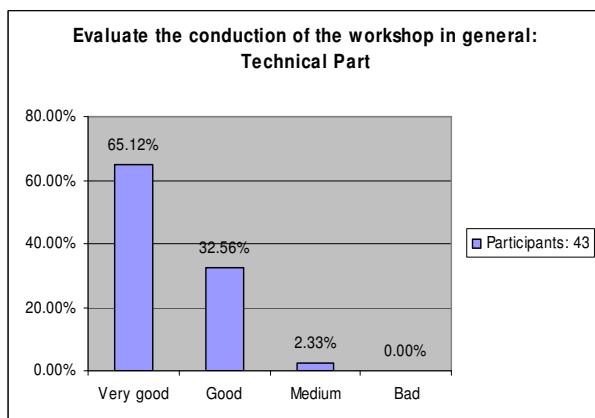
Similarly, participants were asked to evaluate the discussion sessions. As observed, the results are very favourable.



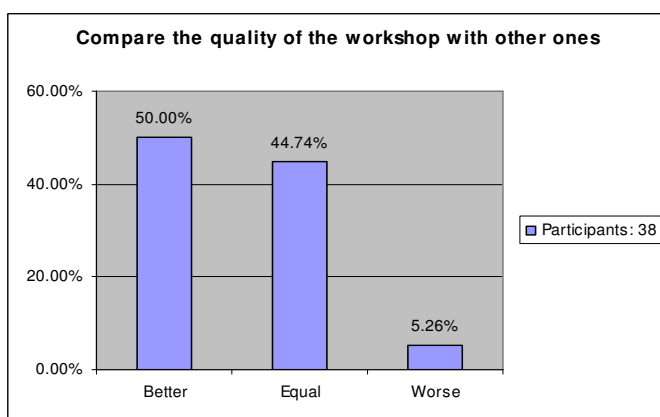
Question 7 focused on the level of conduction of the discussion sessions. As in previous cases, participants felt that the conduction of the sessions could be considered from good to very good.



Question 8 focused on the conduction of the workshop on its technical and logistical segments. As shown, participants considered the conduction of the workshop from good to very good.



Finally, question 9 focused on the comparison between the UN-SPIDER workshop and other workshops which participants have attended. As noted, nearly half of the participants evaluated the workshop as better than others, while almost the other half evaluated it with a quality similar to that of others. Only 5% of the participants evaluated the workshop as inferior to other workshops in which they participated.



As noted, participants evaluated the workshop very positively, also indicating the expectation that UN-SPIDER consolidate the proposed Action Plan and wishing to be kept informed about the activities that UN-SPIDER will be performing in the region.

### Annex 3: Programme of Activities

TUESDAY, 29 SEPTEMBER

Time	Activity	In charge of
8:30 - 9:00	Registration of participants	Organizing Committee
9:00 - 9:30	Inauguration	VM Foreign Affairs and SNGR
9:30 - 10:00	<b>Presentation:</b> The Ecuatorian Risk Management Strategy La	Dra. María del Pilar Cornejo, Director, SNGR
10:00 - 10:30	<b>Presentation:</b> The UN-SPIDER Prorgamme.	Juan Carlos Villagrán de León, UN-SPIDER
10:30 - 11:00	<b>Coffee Break</b>	
11:00 - 11:30	<b>Presentation:</b> The CHARTER, a mechanism to generate information to make decisions.	Gabriel Platzeck, CONAE, Argentina
11:30 - 12:00	<b>Presentation:</b> The use of satellite technology in tsunami early warning.	Bernardo Aliaga, UNESCO-COI, France
12:00- 12:30	Discussion	
12:30-14:00	<b>Lunch break</b>	
14:00 - 15:30	<b>Panel 1:</b> Sources of space-based information.	Moderator: MRECI, Ecuador  Panelists: INPE: Brazil CONAE: Argentina ABAE: Venezuela INEGI: Mexico DLR: Germany
15:30 - 16:00	<b>Coffee Break</b>	
16:00 - 17:30	<b>Discussion Session 1: Policies and strategies to promote use of space-based information.</b> <b>Group 1:</b> Policies and strategies in the context of risk management. <b>Group 2:</b> Policies and strategies in the case of emergency response. <b>Group 3:</b> Policies and strategies in the case of trans-boundary or sub-continental hazards.	All participants divided in 3 groups: Moderation to be conducted by members of the Organizing Committee
17:30 - 18:00	<b>Plenary session:</b> presentations by the 3 Groups.	Rappartours
18:00-19:30	<b>Vin d'Honor offered by the Ecuatorian Air Force</b>	FAE

## WEDNESDAY, 30 SEPTEMBER

<b>Time</b>	<b>Activity</b>	<b>In charge of:</b>
<b>8:30 – 9:00</b>	<b>Presentation:</b> The role of ISDR Platforms as vehicles to thrust the Hyogo Framework for Action.	Nora E. Villegas M., ISDR-Panamá
<b>9:00 - 9:30</b>	<b>Presentation:</b> SNIT: more than a component: a key tool to access and use geo-information for risk management.	Leonardo Espinosa, SNIT- SENAPLADES, Ecuador
<b>9:30 – 10:00</b>	<b>Presentation:</b> Aero-spatial technologies and sensors applied to risks in Ecuador.	Patricio R. Salazar, Directorate of Aero-spatial Development, Ecuador
<b>10:00– 10:30</b>	<b>Presentation:</b> Remote sensing as a tool for environmental management in case of oil spills: experiences and perspectives.	María Jesús Gutiérrez de la Cámara Ara - INTA, Spain
<b>10:30 - 11:00</b>	<b>Coffee Break</b>	
<b>11:00 - 12:30</b>	<p><b>Discussion Sesion 2: Harmonizing Efforts</b></p> <p><b>Group 1:</b> The role of nacional platforms to harmonize the use of geo-information from different sources.</p> <p><b>Group 2:</b> Harmonizing geo-portals to promote their use, avoiding duplicity and maximizing their efficiency.</p> <p><b>Group 3:</b> The SPIDER partnership as a strategy to harmonize efforts at the national, regional, and international levels to promote access and use of space-based information.</p>	All participants divided in 3 groups: Moderation to be conducted by members of the Organizing Committee
<b>12:30 – 13:00</b>	<b>Plenary session:</b> presentations by the 3 Groups.	Rappartours
<b>13:00 – 14:30</b>	<b>Lunch break</b>	
<b>14:30 - 14:50</b>	<b>Presentation:</b> Environmental Indicators and the Latin American and Caribbean Atlas.	Augusto González, CLIRSEN
<b>14:50 - 15:10</b>	<b>Presentation:</b> Observation of Earth and Critical Infrastructures.	Gerard Margarit M., GMV Aerospace and Defence S.A., Spain
<b>15:10 - 15:30</b>	<b>Presentation:</b> Use of space-based information to monitor El Niño-La Niña and their impacts. .	Rodney Martinez, CIIFEN
<b>15:30 - 16:00</b>	<b>Coffee Break</b>	
<b>16:00 - 17:30</b>	<p><b>Discussion Sesion 3: Sustainability of Efforts in Latin America.</b></p> <p><b>Group 1:</b> Strategies to strengthen the connectivity between the space community and the disaster-risk management and emergency response communities.</p> <p><b>Group 2:</b> Strategies to promote the development of new methods and tools which enhance the use of space-based information.</p> <p><b>Group 3:</b> Estrategias para promover la inversión pública y privada en la utilización de métodos y herramientas para acceso y uso de información obtenida mediante satélites.</p>	All participants divided in 3 groups: Moderation to be conducted by members of the Organizing Committee
<b>17:30 - 18:00</b>	<b>Plenary session:</b> presentations by the 3 Groups.	Rappartours

**THURSDAY, 1 OCTOBER**

<b>HORA</b>	<b>Activity</b>	<b>In charge of:</b>
<b>8:30 - 9:00</b>	<b>Presentation:</b> Monitoring of active volcanoes in Ecuador and application of space-based information in early warning during volcanic crisis.	Patricio A. Ramón Maldonado, Geophysical Institute, Ecuador
<b>9:00 - 9:30</b>	<b>Presentation:</b> The Pan-American Laboratory for the Observation of Disasters.	Santiago Borrero Mutis, PAIGH.
<b>9:30 - 10:00</b>	<b>Presentation:</b> Dynamic generation of crisis maps during humanitarian catastrophes and emergencies.	Luis Izquierdo Mesa, Nebrija University, Spain
<b>10:00- 10:30</b>	<b>Presentation:</b> Use of space imagery in phases before and after the occurrence of seismic events and volcanic eruptions.	Emilio Carreño Herrero, IGN, Spain
<b>10:30 - 11:00</b>	<b>Coffee Break</b>	
<b>11:00 - 12:30</b>	<p><b>Discussion Session 5: Strengthening Capacities.</b></p> <p><b>Group 1:</b> Strategies to integrate training programmes at the national, regional, and International levels.</p> <p><b>Group 2:</b> E-learning: suggestions for the UN-SPIDER portal.</p> <p><b>Group 3:</b> Strategies to promote the adoption of the practice of accessing and using space-based information at the institutional level.</p>	All participants divided in 3 groups: Moderation to be conducted by members of the Organizing Committee
<b>12:30 – 13:00</b>	<b>Plenary session:</b> presentations by the 3 Groups.	Rappartours
<b>13:00 – 14:30</b>	<b>Lunch break</b>	
<b>14:30 - 15:00</b>	<b>Presentation:</b> Tools to monitor forest fires and to support the decision-making process using remote sensing products.	Gerard Margarit M, GMV Aerospace and Defence S.A., Cuba
<b>15:00 - 15:30</b>	<b>Presentation:</b> Evaluation of damages provoked by natural phenomena in the agricultural sector using space-based information. de	Dámaso Ramón Ponvert D. CYTED-UTEEDA Network
<b>15:30 - 16:00</b>	<b>Coffee Break</b>	

**FRIDAY, 2 OCTOBER**

<b>HORA</b>	<b>Activity</b>	<b>In charge of:</b>
<b>9:00 - 9:30</b>	<b>Presentation:</b> Applications of geology in risk Management and land-use planning.	Elías Ibandango, National Geologic Service, Ecuador
<b>9:30 - 10:00</b>	<b>Presentation:</b> Space-based applications to forecast El Niño phenomenon and Tsunamis.	INOCAR- INAMHI, Ecuador
<b>10:00- 10:30</b>	<b>Presentation:</b> CRECTEALC: strengthening capacities in the region.	Tania Sausen, CRECTEALC
<b>10:30 - 11:00</b>	<b>Coffee break</b>	
<b>11:00 - 11:30</b>	<b>Presentation:</b> Communication problems in the exchange of information during emergencies.	Ovidio Alcázar Sirvent, INFOCARTO, Spain
<b>11:30 - 12:00</b>	<b>Presentation:</b> A simulation for the generation of maps of crisis scenarios.	Luis Izquierdo Mesa, Universidad de Nebrija, Spain
<b>12:00 - 12:30</b>	<b>Evaluation of the Workshop:</b> Questionnaire to be completed by all participants.	Michael Leitgab, UN-SPIDER
<b>12:30 -14:00</b>	<b>Intervalo de tiempo para discusión + Lunch break</b>	
<b>14:00 - 15:00</b>	<b>Plenary Session:</b> Discussion of recommendation emanating from the group sessions.	Moderation: Organizing Committee
<b>15:30 - 16:00</b>	<b>Coffee break</b>	
<b>16:00 - 16:30</b>	Closing of the workshop.	Authorities

<b>18:00-23:00</b>	<b>Reception offered by the Ministry of Foreign Affairs, Trade, and Integration</b>	MRECI
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