

# Partners in Action



# GRIDEH: The Experience of the Risk Management Network in Huancavelica

This article discusses the experience of the Risk Management Network in Huancavelica (GRIDEH), established by the efforts of several civil society organizations working closely with the local people. It focuses on the work done by Practical Solutions-ITDG in Aurahuá district, Huancavelica department, and how this work relates to the priorities set forth by the Hyogo Framework for Action regarding local and regional disaster risk reduction.

## *Huancavelica and the district of Aurahuá*

Huancavelica is a region located in the Peruvian highlands of the Andes Mountains. It was the cradle of great pre-Hispanic cultures and brought enormous wealth to the colonial administration thanks to quicksilver mining, until the mines declined in the 18th century. However, according to the United Nations Development Program (UNDP) and the National Institute of Statistics and Information Technology (INEI), Huancavelica is now the poorest department in Peru.

Huancavelica is divided into seven provinces, including Castrovirreyna in the central west area of the department, where the district of Aurahuá is located and where Practical Solutions-ITDG has been working since 2008. Aurahuá is in the Andean highlands of the San Juan River basin, which feeds into the Pacific Ocean in the province of Chincha, department of Ica. It covers 360.97 km<sup>2</sup> and has a population of 2,353, most of which live in caseríos (dispersed rural settlements). According to the UNDP's District Human Development Index (DHDI), life expectancy at birth is 66 years, literacy is 85.7% and per capita income is 144.6 soles (approximately US\$48). These indicators were used by UNDP in assigning the district of Aurahuá a DHDI score of 0.5372, ranking it number 1,111 out of 1,831 districts in the country. Regarding the average per capita income, Aurahuá ranks 1,722; that is, in the lowest decile for the country.

Historically, Aurahuá was on the "Mercury Trail," and occupied a strategic place within the colonial economy. Currently, the primary economic activity is agriculture, based on micro-scale farming systems (less than 3 scattered hectares) with low yields and productivity, and is geared primarily to on-farm consumption.

## **Risk management comes to Aurahuá**

Peru has many remote communities or settlements that are hard to reach, partly because of poor roads and mountainous terrain, but primarily because of the neglect of the national authorities. This situation is compounded by a number of factors, including poverty, unsafe houses and limited access to health care<sup>1</sup>, which make these communities highly vulnerable to disasters.

A disaster risk management approach was developed in response to this situation, to provide a "planned, consensus-based, participatory and integrated process for reducing risk conditions in a community, region or country, closely linked to the pursuit of sustainable development."<sup>2</sup> This approach is based on the realization that disasters are not natural and, in order to prevent them, it is necessary to build capacity and reduce vulnerability, while addressing underlying risk factors.

The Aurahuá district is a good example of a community with a high level of vulnerability to disasters. For this reason, since 2008, Practical Solutions-ITDG has been implementing the project titled "Capacity Building for Community-Based Risk Management in Peru and Bolivia" with funding from Lutheran World Relief.

Since its inception, the project has sought to get local people involved to the greatest possible extent. Training was provided on the risk management approach and the Aurahuá Disaster Risk Management Plan was developed with broad-based local participation. The residents of Aurahuá identified the most frequent

<sup>1</sup> We call these underlying risk factors.

<sup>2</sup> CHUQUISENGO, Orlando & Luís GAMARRA. Propuesta metodológica para la gestión local de riesgos de desastre. Una experiencia práctica. Lima: ITDG, 2001.





Photo: ITDG

hazards, such as drought and frost, followed by earthquakes and different kinds of landslides, known locally as huaycos. The level of organization and local knowledge of signs used to forecast the weather, such as rainbow sightings and bird behavior, were some of the important local capacities identified. In addition, a series of proposals were submitted for capacity building on risk reduction.

During its work with the community, the project developed ties with other non-governmental organizations (NGOs) in Aurahuá and in the province of Huancavelica. The next step involved providing the population with further information on issues such as land- use planning, environmental management and climate change to help them participate in the Concerted Development Plan for the district, and in participatory local and provincial budgeting processes. This was followed by working with public authorities in the region to raise their awareness about risk management, as well as to get their commitment to the work taking place in the community. The experience in Aurahuá has begun to be replicated in the neighboring district of Chupamarca, which already has its own disaster risk management plan.

### **Aurahuá and the Hyogo Framework for Action**

The work done by Practical Solutions-ITDG in Aurahuá district is aimed at fulfilling the priorities of the “Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities to Disasters,” established during the World Conference on Disaster Reduction (WCDR) in Kobe, Japan in 2005. Our approach is in line with the Hyogo Framework for Action (HFA), and includes disaster risk reduction at the core of sustainable development.

The project implemented in Aurahuá is primarily linked to Priorities 1 and 3 of the Hyogo Framework. In the first case, by working with community actors and municipal authorities, the project seeks to make risk management a priority in district development plans and replicate this experience to influence regional and national authorities. In the second case, the project seeks to strengthen networks for information sharing, determining measures and helping the local population internalize disaster risk management.

## GRIDE in Huancavelica

As the thinking about disasters and how to prevent them evolved, it became obvious that it was important to create networks that include civil society representatives, specialists and authorities, among others, who can discuss and produce knowledge on disaster risk and build public awareness on the issue.

Thus, in 1998, the Piura Risk Management Group was created. This initiative was strengthened based on the Kobe Conference (2005) and the HFA itself. As a follow-up to this initial action in Peru, networks called Risk Management Promotion Groups (known by their Spanish acronym, GRIDES) have been established in San Martín, Lambayeque, Cajamarca and Ancash. In addition, northeastern and southern macro-regional GRIDES were created.

During the second half of 2008, different organizations in the region of Huancavelica came together to create a risk management network that they called GRIDEH, or GRIDE Huancavelica. Due to the region's geography, they decided to establish two nodes: one in Huancavelica, located in the province of the same name and made up of the following NGOs: CEPES, ITDG, INDESCO, SEPAR, AMUZCEH, CEDINCO, San Javier and CARITAS. This network also included the Mesa de Concertación de Lucha Contra la Pobreza (Joint Board to Fight Poverty). The second node, the San Juan River basin, located in the province of Castrovirreyna, was composed of INDESCO, San Javier, EDUCA, ITDG, AMDINCH and CARITAS. GRIDEH's overall goal is, "to contribute to the promotion and implementation of a risk management approach in the region of Huancavelica," through the development of local capacity, dissemination of information, and political and social advocacy for institutionalizing risk management.

This year, the San Juan River basin node held an activity in Tantará district, where it shared the experience in Aurahuá and submitted a proposal about how to integrate risk management into the updated consensus-based development plans and participatory budgets. Later, both nodes met in Chincha province and signed an agreement to work together on projects that include risk management and climate change adaptation strategies.

## GRIDEH's prospects for the future

The people of Aurahuá and Huancavelica have rapidly developed a sense of ownership of the risk management approach, which confirms their commitment to the creation and functioning of GRIDEH. Undoubtedly, their recurring and recent experiences with disasters have influenced this process. In addition, people feel a stronger need to organize in order to deal with common hazards and problems in places where the government's presence is weak.

GRIDEH has the opportunity to become a leader in the development planning process, understanding that risk management should be addressed as a cross-cutting issue. Likewise, GRIDEH needs to produce more knowledge on those risks that people face and measures for addressing them. The network also needs to build up expertise and a stronger organization. This will enable it to have an influence at the political level; that is, to help authorities at different levels to consider disaster risk management a component of their public policy. Thus, GRIDEH is working to become a strong actor that plays a leading role in keeping future events from turning into disasters.

*For further information, please contact:  
Yuri Gómez, Roberto López and Sergio Tejada  
stejada@itdg.org.pe  
Practical Solutions— ITDG*



# Central America and Cuba

## United in Risk Management



Photo: PFC-GR

*A conversation with Fernando Guasch, researcher of the National Center for Seismological Research of Cuba, and René Ramos, coordinator of the Program for Strengthening Risk Management Capacities.*

Central America and Cuba are working together to benefit the people of the entire region by building the resilience of nations and communities to disasters, and incorporating disaster risk reduction more fully into sustainable development policy, planning and programming. This is being done in accordance with the United Nations International Strategy for Disaster Risk Reduction (UNISDR).

### Background

In 2002, the National Center for Seismological Research of Cuba (CENAI) presented the first version of the Methodology for Pre-Disasters Scenario Studies (Leaders' Course, PAHO, Cuernavaca, Mexico).

In light of its impact, the document was later presented at the Regional Conference of Municipalities, held in Panama in 2006, and again in Costa Rica. As a result, the Program for Strengthening Risk Management Capacities (PFC-GR) in Central America expressed interest and began to work with CENAI.

That year, networking efforts began in the region around scientific and technical cooperation. While the initial focus was the incidence of seismic hazards in the main human settlements in the region, a multi-hazard approach to risk scenarios was gradually developed, with a view towards improving adaptability to climate change and responding to food insecurity, among other vulnerability and risk factors.

Since 2007, Cuba has sent various missions to Central America and has stepped up exchanges relating to disaster prevention and mitigation between the island and the region, in the context of the program titled

“Knowledge management as a function of disaster risk”. The primary goal of the program is to develop and consolidate local strategies for integrated disaster risk management, in order to reduce the impact of disasters and promote adequate development perspectives.

The cooperation initiatives launched by CENAI have been broadened to include the National Center for Meteorological Forecast and the Nipe-Sagua-Baracoa Mountain Range Center. It is also expected that the Ministry of Science, Technology and the Environment (CITMA) will become involved as a key component for achieving a safer type of development in Central America and the Caribbean.

The work done by Cuba and Central America draws on the Hyogo Framework for Action, which highlights the need to organize around disaster risk reduction at the regional level, and to offer international support for issuing forecasts, exchanging experiences and establishing early warning systems. “The work done by Cuba in the region is based on what was agreed upon in Hyogo,” said René Ramos, coordinator of PFC-GR in Central America.

### **Approaches to risk management in Central America and Cuba**

According to Dr. Guasch, what are inaptly termed “natural disasters” have become one of the main threats to human stability and development on the planet. According to this expert, there is a very simple explanation for this: the failure to achieve intelligent co-existence with the forces of nature.

Guasch went on to explain that natural phenomena—which are indicative of the dynamic processes taking place on the Earth’s surface, or are induced by geodiversity— can turn into disasters if we fail to grasp the extent of the hazard they represent to us or the vulnerability of our surroundings.

In this regard, the geosciences researcher noted that Cuba has been working to develop a specific, multidisciplinary and comprehensive branch of science with inputs from environmental, physical, economic and social disciplines that transcend State politics. Known as “Disastrology,” this science “seeks to increase the use of scientific knowledge, new information and state-of-the-art technologies, and contributions from

the social sciences, to reduce the impact of natural and manmade phenomena on human development.”

Dr. Guasch added that the challenge of building a safer world lies in our awareness of the causes that bring about disaster situations, and controlling the factors that exacerbate our susceptibilities.

### **The Cuban experience transferred to Central America**

The Cuban expert also observed that the island developed its Civil Defense System in the 1960s, following an assessment of all of the past natural phenomena in Cuba, and focusing on the importance of human beings and society for the Cuban State. The country is now working systematically to strengthen a set of measures for the protection of the population and the national economy.

Dr. Guasch stressed that owing to this political will—which is reflected in the development and consolidation of Cuba’s National Civil Defense System, premised on public inclusion and participation—the system has proven to be efficient and timely in protecting lives and the State’s principal resources. Over the last few years, the toll on human lives taken by regional hydro-meteorological phenomena such as Hurricanes Mitch, Michelle, Isidore, Lily, Ivan, Charley, Dennis, Katrina and Wilma, has been disproportionately low relative to the frequency and severity of these events in the country. There is no denying, however, that severe natural phenomena, including powerful hurricanes, heavy rainfall and drought, have had a harmful impact on the Cuban economy and the environment.

The Cuban specialist and his Central American colleague, however, are mainly interested in the physical vulnerability of urban housing and they believe more emphasis is needed in this area. For example, through its Institute for Physical Planning, Cuba regulates land use and approaches strategic planning in function of expository risk management. This is done in conjunction with the National Housing Administration and, in particular, with local governments. It is expected that similar work will be done in the Central American region to adapt physical structures, making them more resilient to potential phenomena that might affect the population.



### Progress in the efforts undertaken

Both Ramos and Guasch explained that the work initiated by PFC-GR in the Central American region and Cuba is headed in the right direction, with the integration and mobilization achieved by the Mesas Nacionales para la Gestión de Riesgos (National Risk Management Boards), one of its cornerstones. The two experts concur that this collaboration will be broadened and scaled-up to the extent that stakeholders are able to raise the profile of the problems facing communities at the national level, and achieve an actual strategic disaster risk management locally and nationally.

### Expectations

The primary expectation is to achieve comprehensive knowledge management as a function of disaster risk management.

Dr. Guasch mentioned that this is a broad and complex goal, and one that is necessary in order to holistically address all variables that generate risk: hazards and vulnerability. In addition, “an integrating synergy must be achieved among all sectors of society, in order to develop a true strategic disaster risk management that goes beyond slogans and aims at building capacity in the Region.”

*For further information, please contact:*

*Miriam Chávez*

*Communications officer*

*Program for Strengthening Risk Management Capacities in Central America (PFC-GR)*

*[comunicaciones@pfccentroamerica.org](mailto:comunicaciones@pfccentroamerica.org)*



# RESIS II - Earthquake risk reduction in Central America; A first overview



Photo: CEPREDENAC

**R**ESIS II is a project financed by the Norwegian Government, administrated by SE-CEPREDENAC and technically executed by NORSAR in cooperation with numerous professionals from Europe and within Central America. The project has its focus on Guatemala, El Salvador and Nicaragua which are regarded as most vulnerable in terms of earthquake risk, however, professionals from Costa Rica, Honduras and Panama are actively involved in the numerous workshops and training courses. Thereby the goal of a regional stimulus to professional enhancement in earthquake risk reduction competence is sought.

The philosophy of RESIS II is “bottom up”. This means that as much focus as possible is put on empowering local seismologists and structural engineers with software and knowhow so that future analysis can be

conducted with basis in national competence. Three main objectives are sought through the proposed work:

- Earthquake risk reduction for targets that are of major importance to the society: public service buildings and installations along with a sample of privately owned buildings will be included on the basis of strategic selection. The first focus on buildings that are critical to the society functioning will be done in parallel with work related to normal residence structures.
- Institutional and professional earthquake risk capacity-building in the Central American region. Capacity building will be conducted by primarily following the strategy of learning by doing.
- Information dissemination and awareness creation activities.



These main objectives cover fundamental prerequisites for a stable and sustained development.

The earthquake disasters come from the combination of nature and a poor building environment and it is always instructive to recall the difference between two equally sized earthquakes: The 1989 Loma Prieta earthquake that claimed 63 lives in California and the Armenia 1988 earthquake that claimed 25,000 lives. Such examples tell all about preparation and building quality.

The first results from RESIS II are now appearing: a) A third generation regional earthquake hazard map has been prepared, b) New national seismic hazard results for four countries have been completed, c) A seismic microzoning study for the San Salvador metropolitan areas and d) a detailed housing classification with

vulnerability functions have been developed. More details on these and other studies under RESIS II will be presented in future issues.

RESIS II collaborates with the CAPRA project and with other regional and local initiatives on all issues of relevance for both projects, and RESIS II will also work in close contact with the Global Earthquake Model (GEM) initiative. Professionals in seismology and earthquake engineering that would like to associate themselves with the project are welcome to contact one of the contact points.

*Contact points:*

*Armando Ugarte (augarte@cepredenac.org); Eduardo Camacho (ecmacho@cepredenac.org); Conrad Lindholm (conrad@norsar.no)*



# “CUIDÁ” environmental committees for comprehensive risk management in the Aburrá Valley

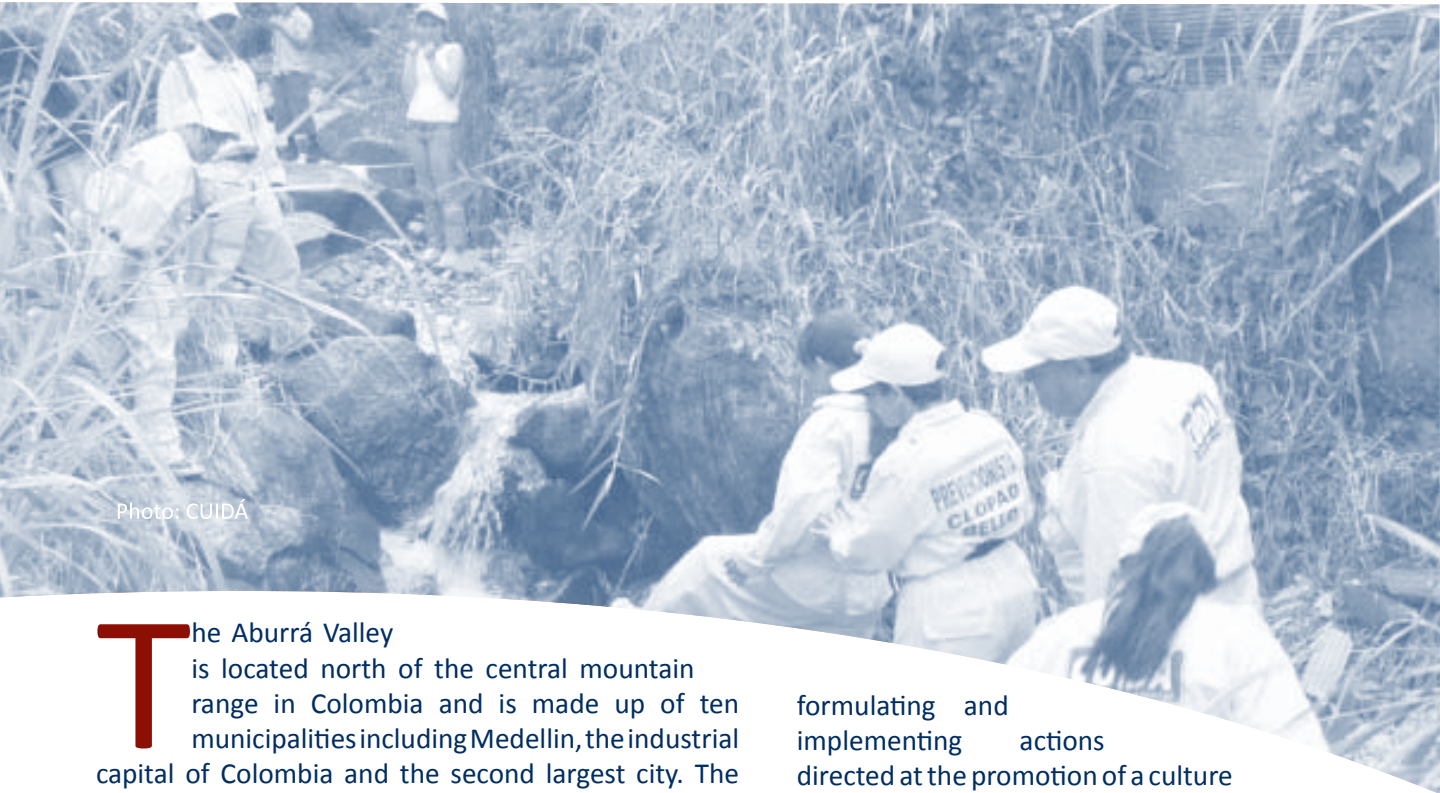


Photo: CUIDÁ

**T**he Aburrá Valley is located north of the central mountain range in Colombia and is made up of ten municipalities including Medellín, the industrial capital of Colombia and the second largest city. The valley covers an area of 1,152 square kilometers (445 square miles) and has a total population of 3.4 million people, 98% of which live in urban areas. Due to the topographical conditions of the valley and the fact that people have been settling in larger numbers in the lowlands and on the hillsides, environmental conditions have deteriorated quickly in the past decade. The worsening conditions have resulted in a number of socio-natural events such as landslides and floods, which have taken the lives of a considerable number of people and caused untold economic loss.

This situation has led the Aburrá Valley Metropolitan Area—the urban environmental planning authority—to work in association with EAFIT University to design and implement a community network for comprehensive risk management in the Aburrá Valley. It is an organized, open, and participatory system that promotes the principles of voluntary action, mutual assistance, solidarity, diversity, tolerance, communication, respect, ownership, and teamwork towards the common goal of taking care of and protecting the environment. It also works towards optimizing natural resources by

formulating and implementing actions directed at the promotion of a culture of environmental awareness and protection.

## **CUIDÁ Environmental Committees**

The basic units, or hubs, of the network are environmental committees that go by the name of CUIDÁ plus the name of their neighborhood or sector. (For example, “CUIDÁ La Inmaculada” is the name of the committee in a neighborhood called La Inmaculada.) The committees are defined as an association of people who work together voluntarily on a program of environmental education, monitoring, and oversight in their geographical area. They are committed to learning about, understanding, and managing their environment while strengthening a culture of environmental awareness and protection.

An environmental and social assessment was conducted in the valley to identify the most critical sectors of the region and, initially, 50 environmental committees were created. The idea behind the committees was that they would facilitate the kind of social cohesion that is essential for the work to be sustained over



the long term. Currently, more than 800 people from diverse cultural, social, and economic backgrounds are participating in the CUIDÁ committees.

Since many children were coming to the various meetings and activities with their parents, CUIDÁ feeder groups were also created. Now, more than 200 children —mostly children and relatives of CUIDÁ members—are participating in these groups while the adults attend other meetings. In trainings designed specifically for them, the children are learning about the culture of prevention and environmental management.

Each committee is capable of creating, accompanying, and sustaining community processes aimed at environmental protection and development. The CUIDÁ committee is the community's first point of contact for environmental response, and it is the channel for communication between the municipal government, the environmental authority, and the community.

The mission of the CUIDÁ committees is to carry out protection, prevention, recovery, and oversight actions related to critical environmental situations. The voluntary work of the committees positions them as local leaders in the area of environmental development, and it generates activities that bring area residents together to raise awareness about the importance of a healthy environment. The committees' primary objective is to work towards the development of the community by getting residents involved in creating and implementing protection, prevention, oversight, and monitoring measures related to the environmental situations particular to their area. They also develop mechanisms for social outreach, teamwork, and shared responsibility.

The environmental committees carry out many activities including: 1) planning and organizing activities aimed at identifying and planning the kind of community outreach work the CUIDÁ will need to do in the areas of environmental management and protection of natural resources; 2) coordination and implementation activities related to carrying out the plans according to the various competencies and capacities; and, finally, 3) oversight and follow-up activities related to the monitoring and evaluation of environmental problems, protection measures and agreements (proposed and implemented), intervention mechanisms, and goals reached.

Other actions taken by the environmental committees include risk management activities. Community work in this area is carried out within the framework of already established models for comprehensive risk management, including organization for effective disaster prevention, response and recovery. The various lines of action are: risk analysis, risk reduction (reducing hazards and vulnerability), risk transfer, response design and execution, and recovery design and implementation (rehabilitation and reconstruction).

### Internal structure of the environmental committees

A CUIDÁ group is a team of volunteers who decide to work together and who take the lead in creating an environmental committee. Under the leadership of a coordinator, members work towards a particular goal, according to their abilities and specific competencies. They are multicultural groups that consolidate and grow stronger as they meet and work together on environmental issues. The organizational chart is arranged according to profiles, jobs, and commissions. This facilitates the work and helps provide greater accountability according to the functions assigned.



Photo: CUIDÁ

Commissions are used by a group of people to achieve their proposed goals by using specific strategies, procedures, and methodologies. Every member of a commission contributes his or her abilities in order to complement the work of other members and to work together for a common objective and goal. Results are a shared responsibility.

### Watch Groups

Watch groups, or vigías, are in charge of monitoring and overseeing environmental conditions in a certain area and are responsible for taking leadership on intervention processes that improve the quality of life of the communities they represent. Members of the

vigías specialize in information about the problems specific to their sector, and they carry out individual and collective actions in a certain subject area. Four types of vigías, or watch groups, have been created. The environmental watch group is the most general structure and is often used in recently established committees. Later on, more specific functions might be added within watch groups that specialize in the watershed, the hillsides, the forest, air quality, or other areas.

### Environmental Education Commission

The Environmental Education Commission is in charge of promoting educational opportunities not only within the CUIDÁ group, but also in the community as a whole. It coordinates actions aimed at improving the environmental conditions of the surrounding areas by identifying institutional and social actors who have the responsibility and the need to participate in solving existing problems.

### Prevention and Emergency Response Commission

The primary goal of the Prevention and Emergency Response Commission is to strengthen the CUIDÁ groups by promoting an environment that can be improved and sustained by taking care of existing resources. The condition of these resources has deteriorated and their inappropriate use can cause significant environmental problems

### Acknowledgements

This project was made possible thanks to the Metropolitan Area of the Aburrá Valley and its ongoing work on sustainable development and on improving the quality of life for its residents. The authors would like to express their sincere thanks to the entire team of the EAFIT University for their excellent work

*For more information:*

*Edier Aristiábal, MI, PhD Student. Project Coordinator. Área Metropolitana del Valle de Aburrá, Calle 41 No 53-07, Medellín, Colombia. Tel. 385-6000 ext. 438.*

*[edier.aristiabal@metropol.gov.co](mailto:edier.aristiabal@metropol.gov.co)*





# Socioeconomic Assessment of Disasters in Mexico: A tool for risk management



Photo: SCT Sinaloa

Since time immemorial, disasters, whether of natural origin or manmade, have had a great impact on the history of humanity and represent one of the greatest latent threats we face. According to the Economic Commission for Latin America and the Caribbean (ECLAC), a disaster is “an event, usually sudden and unexpected, which causes damage, losses and temporary breakdown of activities in a given area, affecting a substantial part of the population.” What are often referred to as ‘natural disasters’ are those related to the occurrence of geodynamic, hydrological, atmospheric or biological phenomena; while anthropogenic disasters refer to events related to technology, human processes or pollution.

Knowing the incidence and impact of disasters leads to the development of public policies that contribute to mitigating the socioeconomic effects of these phenomena. Therefore, for over 25 years the United Nations (UN) —through ECLAC— has been developing and using a methodology for assessing these adverse effects.<sup>1</sup> Different assessments have been conducted using this methodology that give an account of the losses and damage caused by extreme natural phenomena in Latin American and Caribbean countries.

Since ECLAC only conducts socioeconomic assessments upon government request and these only analyze a specific event, the true magnitude of human and material harm that disasters cause every year is not accurately known in any country. For this reason, the National Center for Disaster Prevention (CENAPRED) in Mexico has been conducting an annual national disaster assessment based on the ECLAC methodology since 1999.

The results of these efforts have been published in a series titled *Características e impacto socioeconómico de los principales desastres en la República Mexicana* [Characteristics and Socioeconomic Impacts of Major Disasters in the Republic of Mexico], of which there are ten volumes thus far. This compendium, in addition to offering information on the history of disasters in this country, includes statistics on the human and economic losses caused by these phenomena. It also collects experiences from each region on emergency response and describes the characteristics of each disaster.

It is worth mentioning that these studies not only document the most significant disasters—such as the 1985 earthquake in Mexico City— but they also list medium- and small-scale events, which end up causing

<sup>1</sup> ECLAC, Handbook for Estimating the Socio-economic and Environmental Effects of Disasters.

**Table 1. Deaths and Damage: Averages for 1980-1999 and 2000-2008**

Period	Total Deaths	Total Losses and Damage (US\$ Millions)	Average Annual Deaths	Average Annual Losses and Damage (US\$ Millions)
1980-1999	10,114	14,027	506	701
2000-2008	1,582	12,608	176	1,401

Source: CENAPRED

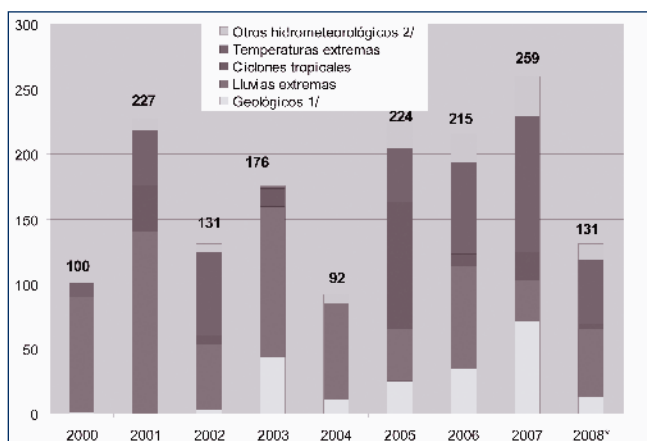


Figure 1: Deaths by type of phenomenon 2000-2008

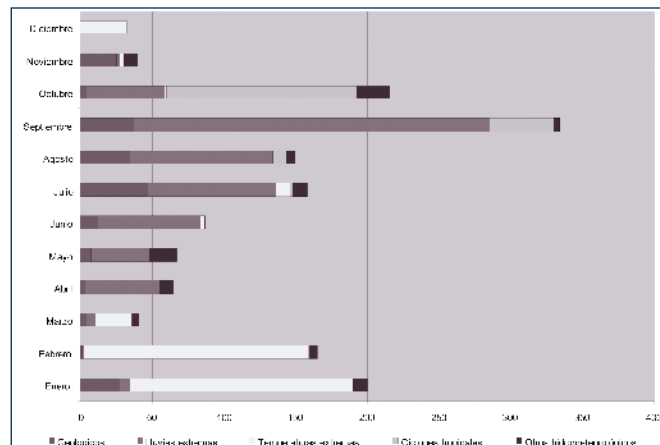


Figure 2: Deaths by month and type of phenomenon 2000-2008

greater suffering on the whole.

To give an example, in 2008, no large-scale disasters were recorded —no events similar to the flooding that occurred in Hidalgo, Puebla, Veracruz and Tabasco in 1999; Tropical cyclone Isidore in 2002; Hurricanes Emily, Stan and Wilma in 2005; or the flooding in Tabasco in 2007. However, some 30 localized catastrophes were recorded, and the damage they caused amounted to more than 100 million Mexican pesos each. Thus, the cost in damages was around US\$1.2 billion, making 2008 the third worst year for economic losses that Mexico has suffered in the last decade, as a result of disasters caused by hydro-meteorological events.<sup>2</sup>

This important body of knowledge enables comparative analyses of the socioeconomic impacts caused by the most recent disasters and those that occurred decades earlier. For example, during the period between 1980 and 1999, natural disasters caused, on average, 506 casualties and US\$701 million in damages per year; while in the last nine years (2000-2008), the number of deaths dropped to 176 per year, but economic losses essentially tripled.<sup>3</sup>

This drop in the number of victims results from the development of the Tropical Cyclone Early Warning System (SIAT-CT) in 2000. But the increase in losses and damage possibly stems from two factors in particular: an increased level of exposed infrastructure and facilities, and the increased intensity and incidence of natural phenomena as a result of climate change

Another of the advantages of having systematic records of the impacts of disasters is that it enables to identify which events affect certain sectors more than others. For example, it has been observed that agriculture is one of the sectors more exposed to the impact of tropical cyclones, due to the strong winds and to the amount of water, which cause losses in thousands of hectares of different crops. Likewise, floods in urban areas have a recurring impact on housing, as well as on communications and transportation infrastructure.

A retrospective analysis of the deaths caused by disasters in the last nine years showed that the greatest number of casualties was caused by hydro-

<sup>2</sup> CENAPRED, IMPACTO SOCIOECONÓMICO DE LOS PRINCIPALES DESASTRES OCURRIDOS EN MÉXICO EN 2008.

<sup>3</sup> CENAPRED, Area of Social and Economic Studies.



meteorological events, chiefly torrential rains and extreme temperatures (Figure 1). Likewise, it was observed that, historically, the months of September and October are the ones with the highest recorded rates of deaths, due to the occurrence of tropical cyclones and extreme rainfall (Figure 2).

In Mexico, the disasters that have impacted the most are the 1985 earthquakes, which caused at least 6,000 deaths and losses that amounted to thousands of millions of pesos. The flooding in Tabasco in 2007 is considered the second most expensive disaster in recent Mexican history. Fortunately, these events did not take a toll on lives because of the advances in the area in civil protection, both regarding prevention and emergency response.

Another of the advantages of keeping systematic records of the impacts caused by disasters is to identify which events affect certain sectors more than others. For example, through the years, it has been seen that the agricultural sector is one of the most exposed to the impact of tropical cyclones, due to the strong winds and enormous quantities of water that cause losses in thousands of hectares of different crops. Likewise, floods in urban areas have a recurring impact on housing as well as on communications and transportation infrastructure.

Governments in the different countries must understand that the socioeconomic assessment of disasters is a basic tool for:

- a) Developing specific support mechanisms or funds in the event of disasters;
- b) Identifying the most vulnerable sectors that need greater support in case of a disaster;
- c) Planning and improving policies aimed at disaster prevention and at the creation of tools that enable transferring the cost of disasters to third parties, whether through insurers, private investments, or even the public sector;
- d) Determining the capacity of a State or region for carrying out reconstruction efforts and establishing priorities;

- e) Accurately calculating the minimum requirements for obtaining the financial aid needed;
- f) Channeling aid to the most affected sectors, and distributing it among the affected population;
- g) Developing a databank by type of disaster and region affected. In the medium term, the databank will enable users to determine the most vulnerable regions in the country to certain types of phenomena; and
- h) Implementing prevention measures, taking into account the cost-benefit ratio.

*Karla M. Méndez Estrada*  
National Center for Disaster Prevention  
Researcher, Area of Social and Economic Studies  
[karla@cenapred.unam.mx](mailto:karla@cenapred.unam.mx)

*Rafael Marín Cambranis*  
National Center for Disaster Prevention  
Researcher, Area of Social and Economic Studies  
[rafael@cenapred.unam.mx](mailto:rafael@cenapred.unam.mx)

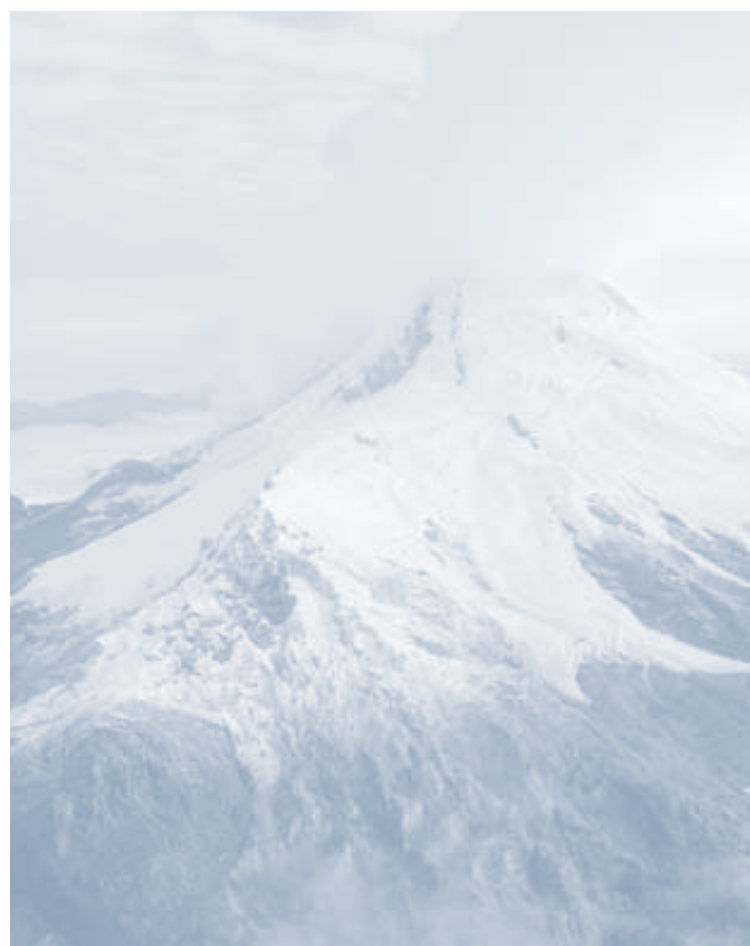


Photo: Henry Peralta

# Integrated risk management for volcanic hazards: “Galeras process” resettlement strategy



Photo: Wikipedia Commons

**G**aleras Volcano is located in the department of Nariño, Colombia, “at a distance approximately 9 km in a straight line from the department capital, San Juan de Pasto, at an altitude of 4,276 meters above sea level,” according to the Colombian Institute of Geology and Mining (INGEOMINAS, 2006). The volcano’s reactivation will predictably have a high impact on the social units located in the surrounding area, making it necessary to resettle the people living in the High Volcanic Hazard Area (ZAVA, by its Spanish acronym). This article explains the implementation of the “Galeras process,” a pilot program in Colombia designed around prevention. It is also a coordinated, inter-institutional exercise carried out by the team that implements the program, which

understands that resettlement is part of integrated risk management, related to local development and focused on several dimensions: legal, social, cultural, economic/ production and environmental.

## History of Galeras Volcano

Documentation of the activity of Galeras Volcano only began with the Spanish conquest. However, according to geological information from INGEOMINAS (2006, 1), “six important eruption events have been identified, in 4500, 4000, 2900, 2300 and 1100 BC, along with an eruption in 1866 AD. During the past 500 years, most of the eruptions have been classified as vulcanian, with low eruption columns (<10 km), which have produced



gas and ash emissions, small lava flows and explosive eruptions with the generation of pyroclastic flows (hot clouds of solid and gaseous material), the deposits of which reached distances of up to 9.5 km from the crater.”

The first documented eruptive phase of Galeras Volcano was quite long, lasting from 1535 until August 1936, when activity ended. “Following a period of relative repose,” a second phase then occurred from June 1988 to June 1993, “which was associated with a phase of clearing and opening of the volcanic conduits, characterized by increased seismicity and signs of surface activity (INGEOMINAS, 2006, 2).

Photographs published in the book by Martínez Sierra (2002, 79 and 90) show an eruption in 1936 in which a pyroclastic flow can be seen moving northward.

Eleven years later, a third phase of activity began, marked by more frequent eruptive events, beginning on November 21, 2004 throughout April 24, 2009.

### **Legal and institutional framework**

With the reactivation of Galeras Volcano, the national government issued Decree No. 4106 on November 15, 2005 declaring that “the municipalities of La Florida and Nariño and the towns of Mapachico and Genoy in the municipality of Pasto were a disaster area.” The disaster declaration enabled the use of certain legal tools: Decree No. 4046 of November 10, 2005, which appointed the Intersectoral Commission; CONPES Official Document No. 3501 of December 3, 2007 on policy guidelines for integrated risk management; and Decree No. 3905 of October 7, 2008 on the implementation of a resettlement plan.

The process is based on guidelines issued at the central government level by the Colombian President’s Office through the Ministry of the Interior and Justice, jointly with the Bureau of Risk Management for Disaster Prevention and Relief (DGRPAD, previously DPAD). At the regional level, responsibility for the process was given to the Nariño governor’s office, through the Regional Council for Disaster Prevention and Response (CREAPAD), which is in charge of the development and adoption of the Specific Action Plan (PAE), adopted in April 2009. At the local level, direct responsibility both for relations with the community and for making decisions related to resettlement lie with the municipal

governments of Pasto, Nariño and La Florida, each of which has its own Local Disaster Prevention and Response Committee (CLOPAD). Additionally, all the institutions that are part of the National System for Disaster Prevention and Response (SNPAD) also have responsibilities in this process.

### **Managing the Galeras process**

Given the complexity of the process, it was necessary to create an agency located in the city of Pasto for the purpose of linking the ZAVA with all the bodies (national, regional and local) involved in the intervention. The agency provides guidance and assistance to these institutions so that they are able to take on the responsibilities they have been assigned. The Galeras process is also in charge of supporting the community involved regarding its organization, participation and decision-making. Thus, the management team of the Galeras process was put in place to undertake the work of coordinating and facilitating linkages. The office is part of DGRPAD, through an agreement with the United Nations Development Program (UNDP).

The goals of the team in charge of managing the Galeras process are to:

1. Manage and implement actions around inter-institutional and community coordination in order to guarantee integrated risk management related to Galeras Volcano.
2. Consolidate baseline technical studies.
3. Coordinate, develop and implement the Social Management Resettlement Plan.

Internally, the management team is organized into five areas: land management, economics and production, land and environmental use planning, social and cultural planning, and the geographic information system (GIS).

### **Population resettlement: progress report, difficulties and challenges**

When we talk about “resettlement,” we make a distinction with the concept of “relocation.” This is because the move is not just a physical activity; it also involves the present and future of human beings who have an overarching right to life. The Galeras process is attempting to mitigate the socioeconomic impact

on the social units in the ZAVA from the disaster declaration; provide for the transfer of social units; assist in reestablishing living conditions for the population; facilitate access to and allocation of subsidies and other resources; and foster the involvement of the social units in designing productive projects.

It should be stressed that resettlement of urban and rural families located in the ZAVA is unavoidable to protect their lives and assets, and to facilitate their access to legal, safe housing options (Office of the President of Colombia, Ministry of the Interior and of Justice, Decree 3905 of 2008). There are approximately 8,235 inhabitants, 1,894 households and 5,670 properties in the entire High Volcanic Hazard Area (ZAVA), in the municipalities of San Juan de Pasto (5,663 inhabitants, 1,202 households, 2,067 properties), La Florida (2,118 inhabitants, 570 households, 1,090 properties), and Nariño (454 inhabitants, 122 households, 446 properties). These figures come from the population census in the ZAVA carried out by the Colombian Statistics Bureau (DANE) in 2005.

In addition to conducting technical studies and gathering and organizing information, the transition stage has been used to create the Technical Committee on Lands and the Resettlement Steering Committee, which puts mechanisms in place for addressing challenges and difficulties. In the few months since the intervention began, several advances have been made in different areas, particularly on the issues of land use planning and environmental management. The municipalities and other official bodies have linked up to make adjustments to the Pasto Land Use Plan, and the Nariño and La Florida Land Use Systems. Both land use plan and the systems are beginning to include risk-related issues; however, it will still take some time for them to be approved.

With regards to resettlement sites, different locations and proposed housing designs have been identified. There are cases in which the social units in the ZAVA have already lived in an urban area and want to move to a similar type of location. On the other hand, there are inhabitants who have always lived in rural areas but who want to live in an urban area, and finally, some people from rural areas want to resettle in a rural area where their future home can be similar to the one they are leaving behind in the ZAVA.

For this reason, the Galeras process management team is evaluating different options and seeking proposals for housing stock. For example, low-cost single and two-family housing projects are being developed in the city of Pasto. In addition, land is being sought in rural areas where houses can be built. Interestingly, some social units, on their own, are seeking houses in other cities in the country. During this process, the program is providing comprehensive services to the social units through its different work areas.

Finally, it is important to note that risk management in the Galeras process is a laboratory for protecting lives. Because of its experimental nature —this program is unique in Colombia— the institutions involved run into legal, physical, social, cultural and empowerment-related issues on a daily basis. However, they are clear that when difficulties do appear, they must be proactive and take action aimed at finding prompt solutions.

*For further information, please contact:*

*Esperanza Josefina Agreda Montenegro, Coordinator, Area of Land Management, Galeras Process Management (GPG) tamia029@yahoo.com*

## References

- DANE (2005). *Registro de población, vivienda, unidades económicas y/o agropecuarias ZAVA*. Santafé de Bogotá D.C.: DANE.
- INGEOMINAS (2008). *Reportes de actividad*. Taken on March 19, 2009 from the following website: [http://intranet.ingehominas.gov.co/pasto/Reportes\\_de\\_actividad](http://intranet.ingehominas.gov.co/pasto/Reportes_de_actividad)
- INGEOMINAS (2006). *Actividad histórica Galeras*. Taken on March 18, 2009 from the following website: [http://intranet.ingehominas.gov.co/pasto/images/e/e1/Actividad\\_historica\\_galeras.pdf](http://intranet.ingehominas.gov.co/pasto/images/e/e1/Actividad_historica_galeras.pdf)
- Martínez Sierra (2002), L.A. *Historia de la actividad del volcán Galeras y percepción de los fenómenos telúrico-volcánicos en el contexto cultural de Pasto*. Santafé de Bogotá: El Malpensante.
- President's Office of the Republic of Colombia, Ministry of the Interior and Justice. *Decree No. 4106 of 2005*. Santafé de Bogotá D.C.: Ministry of the Interior.
- President's Office of the Republic of Colombia, Ministry of the Interior and Justice. *Decree No 3905 of 2008*. Santafé de Bogotá D.C.: Ministry of the Interior.



## Request for papers on urban risk: Very encouraging findings emerge from the growing interest in this subject in the region



**O**n the occasion of the first session of the Regional Platform for Disaster Risk Reduction in the Americas, held in March 2009, a call was issued to individuals, organizations and institutions in the region to present technical articles on practices, experiences, and research on topics related to risk management in cities of Latin America.

The results were gratifying: 30 abstracts were received, from which 21 technical articles were chosen for presentation. Finally, 15 of these were selected for a publication that is one of the products of this initiative. From a geographic standpoint, the countries of the Andean and Central American sub-regions were better represented. Thematically speaking, the articles cover a broad spectrum of issues in three primary areas:

1. Design and implementation of risk reduction programs and projects in cities;
2. Evaluation and appraisal of disaster risks in urban environments; and
3. Community-based participation in risk management in cities.

The 15 selected articles offer a good cross-section of the realities of disaster risk management in our cities. They describe relevant experiences in post-disaster recovery processes involving local governments, together with universities and other stakeholders from civil society. They also demonstrate the pivotal role of NGOs in implementing risk management projects at the local level, as well as the ongoing interest in developing methodologies for the evaluation of hazards, vulnerability, and risk. Many of the contributors showed significant interest in the analysis of disaster risk problems from a social perspective. The articles also show how universities and NGOs, and occasionally local governments, are spearheading efforts to document risk management processes and practices. At the same time, there are few documented experiences concerning technological risks and finally, very few articles addressing the major cities in the region.

Five of these papers were presented during the first session of the Regional Platform, held in Panama. Below, we present a summary of each of these, as a

preview of the publication that we will soon deliver as a contribution to disaster risk reduction in our cities.

### **From recovery to development planning: the case of flooding in the city of Treinta y Tres, Uruguay**

Authors: Adriana Piperno and Pablo Sierra, ITU, School of Architecture, University of Uruguay.

This paper analyzes the “recovery-development” process in the town of Treinta y Tres, Uruguay (with a population of approximately 33,000 people) following extraordinary flooding in May 2007. The study focuses on actions with a regional impact, examines the role of stakeholders and the outcomes, successes, and difficulties from the standpoint of priorities for action. Three moments stand out: during the early recovery phase, the university assisted the local government to set up an information system in the floodable area, which facilitated the response, as well as the regional planning efforts by local and national technical experts. Later, once a semblance of “normalcy” had been restored, the local government revisited its public policies to incorporate risk-related issues. Precautionary measures were identified at the territorial level and existing social programs for upgrading habitats were reworked. Finally, and with the help of the central government, progress was made in designing instruments to be used in land use planning and urban water management, such as the Management Plan currently under public review.

### **Study of resilience in natural disasters in six neighborhoods of La Paz, Bolivia**

Author: Luis A Salamanca, National Center of Competence in Research (NCCR-NS), Bolivia

This article presents the findings of a case study on vulnerability and resilience in communities located along the eastern slope and Río Abajo in the La Paz valley, where mudslides and floods are regular occurrences. It offers a comparative analysis of vulnerability and resilience to disasters experienced by residents in both areas — the first a poor peri-urban area and the second a mixed area (featuring high-income families as well as farmers). Residents are aware that they live in unstable areas, but the former lack the necessary resources to live in safer areas, and are therefore very

exposed and must address their problems through formal and informal channels. The latter address rehabilitation issues individually. In both cases, in the absence of advocacy groups, they are unable to place their concerns on the public agenda. Without any visibility at the government level, or even among those living in high risk areas, it is very difficult to build resilient communities. Consequently, in the aftermath of disaster, those with financial resources are able to rebuild, while the most vulnerable are not.

### **Methodology for the analysis of vulnerability and risk in buildings of urban centers during floods and earthquakes**

Author: Olga Lozano Cortijo (PREDES), Peru

The Center for the Study and Prevention of Disasters (PREDES) presented this methodology, which was designed and used in the “Disaster Risk Management Component for Land Use Planning in the city of Calca, Calca District, Cuzco Region, Peru,” as part of the Participatory Pilot Project for Local Disaster Risk Management in Calca District, Cuzco Region. The methodology was prepared by PREDES, in association with Welthungerhilfe (German Land Action), and promoted and financed by the Andean Community Disaster Prevention Project (PREDECAN). This is a methodology for the analysis of vulnerability and physical risk of floods and earthquakes in buildings in general, and urban emergency services and public places in particular. The methodology is based on semi-quantitative methods that have been adapted to the conditions of small municipalities, which, like Calca, lack the information and technological capacity found in large cities.

### **Disaster preparedness in unstable settlements of the metropolitan area in Guatemala City, Central America**

Authors: Edy Manolo Barillas and Maribel Carrera, Oxfam Great Britain, Guatemala City

The article describes the experience of implementing a disaster preparedness program (DIPECHO) in three areas of the metropolitan area in Guatemala City, beginning in 2004. In an effort to empower communities and strengthen ties to the National Coordinating Body for



Photo: J. J. Trelles

### **Flood risk in the city of Tapachula, Chiapas, México (study on ecological management and urban development)**

Authors: Miguel Ángel Vásquez Sánchez, Gloria Espíritu Tlatempa, Horacio Morales Iglesia, Guillermo Montoya Gómez and Darío Navarrete Gutiérrez, Southern Frontier College, Institute of Sciences and Arts, Mexico.

Disaster Reduction (CONRED), the program has worked in areas such as the demarcation of areas susceptible to landslides; the evaluation of risks and community capacity; the organization, training and equipping of communities for disaster response; implementation of rain monitoring and warning system; development of emergency plans and information activities, and community and institutional education and communication. Since the goal is to create a model appropriate to an urban context, efforts to develop effective links between communities and public institutions are critical. Nonetheless, it has been the small steps taken in practice that have persuaded and encouraged the stakeholders that these programs work and that the search for a model must be a collective undertaking.

The complex dynamics of urban poverty in the metropolitan area of Guatemala City, and its institutional density, poses many challenges to achieving an appropriate risk reduction model. Meanwhile, although weaving relationships can be an arduous process, it also lays the groundwork so that disaster preparedness in places where communities are so vulnerable can lead to a more comprehensive and sustainable framework.

The article presents the findings of a study on ecological management and urban development in the city of Tapachula, which has 190,000 inhabitants and is the second most important city in the state of Chiapas. The city was affected by Hurricane Stan in 2005. The purpose of the study was to understand the physical, social, and economic conditions of both the city and the municipality of Tapachula. The target area was examined from the urban, municipal, regional, state, and border perspectives. The methodology included an epistemological approach to the concepts of vulnerability, risk, disaster, management, ecological/land use planning, and urban development, with a priority on geo-morphological methods of land use and urban planning. The main findings of the study demonstrate the need to approach this city—and others with similar conditions—from the standpoint of urban-rural interaction, with a vertical watershed management focus, and a horizontal-regional focus on rural development through road networks and socioeconomic conditions. They also spotlight the need to protect and effectively manage natural areas, including those in urban settings, and to promote Tapachula as an enlightened territory and a sustainable city.



## Fifth Anniversary of CIR-UDEFA, in Punto Fijo, Venezuela



**O**n April 25, the Risk Research Center of the University of Falcon (CIR-UDEFA), located in Punto Fijo, state of Falcon, Venezuela, celebrated its fifth anniversary.

Founded by a group of professionals and academics interested in disaster risk reduction, the Center has been directed since its inception by engineer Juan Murria.

The following are some of CIR-UDEFA's achievements over the past five years:

- Three international seminars on "Community Involvement in Risk Reduction Programs." The first seminar was held in Punto Fijo, in October 2002. The second one took place in October 2007 in Coro, the capital city of Falcon state, where the University of Falcon opened its second campus in 2006. A third event was held in September 2008, also in Punto Fijo, and a fourth seminar is scheduled for the fourth quarter of 2010. These events were attended by a large number of private and public university students, as well as distinguished, expert panelists from Japan, the Netherlands, the United States, Mexico, Colombia, Cuba, Barbados and, of course, Venezuela.

- Other seminars, workshops, short courses and conferences with the participation of renowned national and international professionals.
- On-site seminars and workshops at the following corporations: Total Oil Company of Venezuela, Holcin Cement of Venezuela, and the State-owned power company Electrificación del Caroní (EDELCA).

CIR-UDEFA's future plans include a project titled "Natural, technological, anthropic and environmental risk mapping for disaster reduction and sustainable development planning in Paraguaná Peninsula, Falcon state," in the framework of the 2001 Basic Law on Science, Technology and Innovation (LOCTI). The project is awaiting formal approval from the Ministry of Science and Technology to launch its activities, which will last throughout 2012. Venezuelan experts and researchers will participate in the project, under the coordination of engineers Ángel Rangel, former director of the National Civil Defense Bureau, and Juan Murria, director of CIR-UDEFA.

*For further information, please contact:*

*Juan Murria*

*FUNVISIS*

*[jmurria@hotmail.com](mailto:jmurria@hotmail.com)*

## El Salvador creates a National Platform for Disaster Risk Reduction



Photo: SNET

**T**he Salvadoran Platform for Disaster Risk Reduction was established with the purpose of developing disaster risk reduction policies and guiding development so that it takes into account measures for risk reduction and actions for disaster prevention, while fulfilling the commitments made at the World Conference on Disaster Reduction, held in Kobe, Japan.

The National Platform was created as the result of the efforts made by a number of national institutions involved in risk reduction and disaster prevention in El Salvador, and through a broad-based discussion process, by which it was agreed upon that, initially, all institutions that belong to the CEPREDENAC<sup>1</sup> National Commission would make up the base of the National Platform.

In this context, the National Platform was launched on July 16, 2008, and comprises a representative group of government institutions. In early 2009, civil society organizations and the United Nations Development Program (UNDP) were also included. This strengthened and maximized the potential of the National Platform to become a high-level mechanism for formulating social and economic proposals for disaster risk reduction.

The following are some of the government institutions that participate in the National Platform: the Ministries of Education, Public Health and Social Assistance, National Defense, Agriculture and Livestock, Foreign Affairs through the Technical Secretariat of the President's Office, Interior through the General Civil Protection Office, and Environment and Natural Resources through the General Bureau of the National Service for Territorial Studies.

In accordance with its action plan, the Salvadoran Platform serves as a mechanism for promoting disaster risk reduction (DRR) at different levels. In this capacity, it coordinates, analyzes and advises on priority areas that require a participatory and collaborative process.

The National Platform expects to become the coordinating mechanism for mainstreaming DRR into development policy, planning and programs, in line with the implementation of the Hyogo Framework for Action (HFA). The goal is to contribute to establishing and developing a broad-based national system

<sup>1</sup> The Central American Coordination Center for Natural Disaster Prevention (CEPREDENAC).

for disaster risk reduction, complemented by the CEPREDENAC National Commission and the Civil Protection National Commission.

Drawing on this vision, the initial group that comprises the Salvadoran National Platform requested that other institutions working on risk reduction be included, such as national and international cooperation agencies. Thus, the NGO "Geologists of the World" (Spain), the United Nations Development Program (UNDP/El Salvador), the Ministry of Treasury, the private sector, university representatives and the Foundation for Economic and Social Development (FUSADES) are now part of the Platform.

To date, the work done by the National Platform has focused on creating and consolidating this group of institutions and organizations, and developing mechanisms, work proposals, guiding principles and a vision for the future, based on the UNISDR guidelines for establishing National Platforms.

Among the most significant contributions to date, it is worth mentioning the review of the country report, in line with the actions proposed by the Hyogo Framework for Action 2005-2015, and fostering a proposal for integrating other sectors of the Salvadoran society, as well as institutions working on economic and social development issues, into the National Platform.

This year, one of the activities carried out by the National Platform was the review of the Mitch+10 Country Report in July 2009, through a broad-based participatory process. Additionally, the Platform provided technical input to the First National Report on the Status of Risk and Vulnerability in El Salvador, which

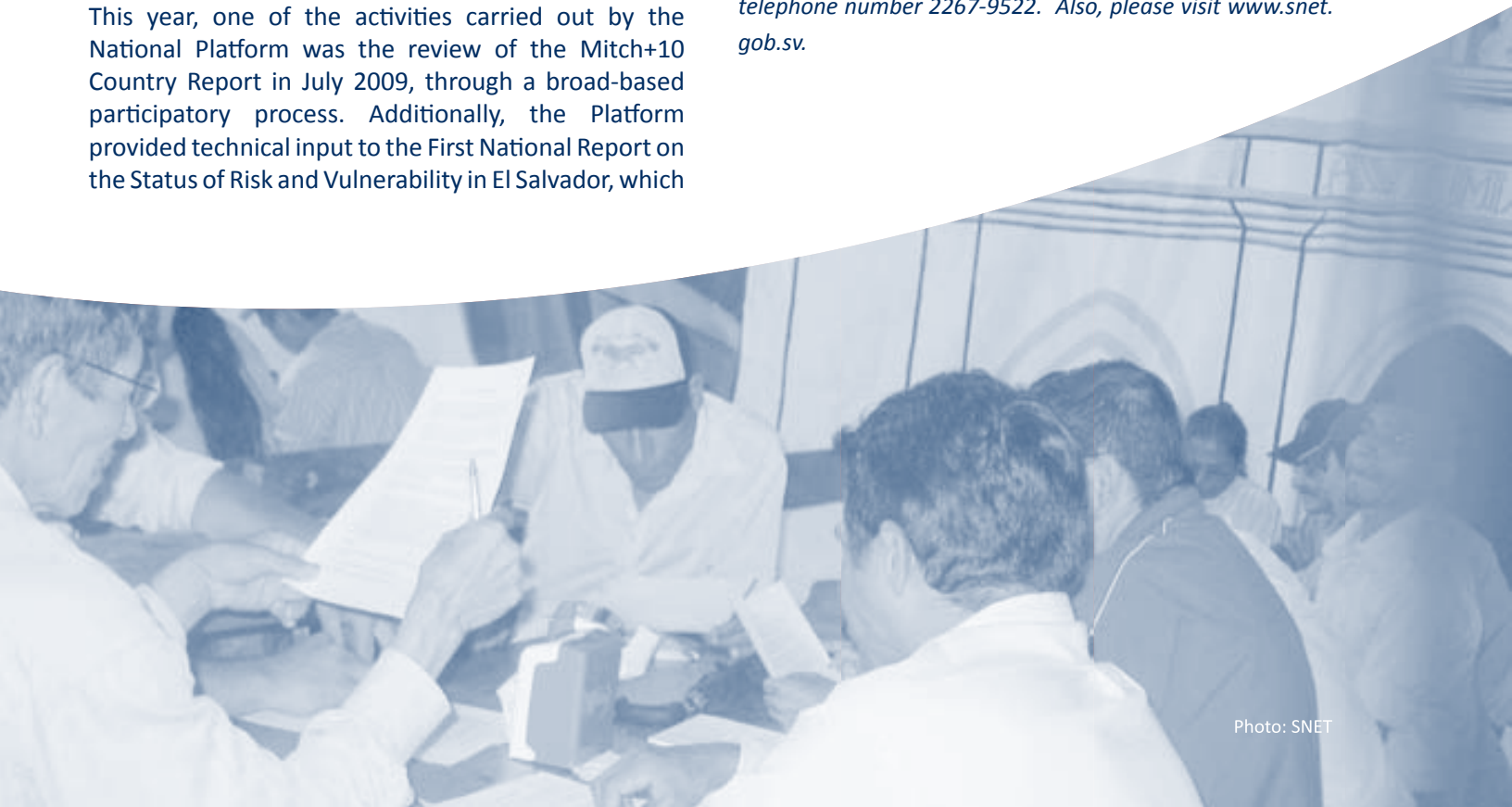
is expected to become a tool for technical and political management among all sectors in the country.

Among the activities planned by the National Platform in the near future, it is worth mentioning the development of a proposal for political instruments for disaster risk reduction, the design of strategies for promoting the participation of different stakeholders, and the management of resources available for further implementation of the actions set forth by the Hyogo Framework for Action.

In addition, the Platform is considering the holding of high-level forums in the future, as a space to participate and exchange information and lessons learned on risk reduction.

Finally, the Platform plans to put in place mechanisms for incorporating risk reduction into economic and social development policy, and for mobilizing resources so that its activities are sustainable. Likewise, the Platform will be promoted as a technical space for discussion among its member institutions, in order to exchange information, generate specific proposals, and produce results nationwide.

*For further information about the Salvadoran National Platform for Disaster Risk Reduction, please contact Ernesto Durán, institutional liaison, at [fduran@marn.gob.sv](mailto:fduran@marn.gob.sv), telephone number 2267-9522. Also, please visit [www.snet.gob.sv](http://www.snet.gob.sv).*





# Information Management for Strategic Disaster Risk Management in the Republic of Cuba



Photo: J. J. Trelles

## Summary

**D**uring the last decade, we have focused our research on developing methodologies aimed at contributing the cognitive elements needed to develop effective disaster prevention strategies in our country, fulfilling in this way the mission of CITMA in the National Civil Defense System.

Our strategy is based on a prospective model where pre-disaster scenarios studies (PDS) are recognized as basic elements for comprehensive risk management at the local level (CRML). Both of these aspects are defining factors in the adoption of disaster risk management strategies (Guasch, 2006).

In Cuba, the work today is based on managing information to achieve two higher objectives in the field of disaster management. The first objective is the ability to predict disasters (through PDSs). The second is comprehensive disaster risk prevention through strategic management (SM), defined as a function that relates to reactive management, corrective management, and prospective management, and

whose primary goal is to integrate multi-disciplinary and multi-sectoral actions into the civil defense system in order to enhance the safe development of our population.

Results of the research conducted have been validated in various risk scenarios and have served as a basis for assessing the impact of the diverse natural and man-made events that have hit the country and have led to establishing new management goals. These goals include the creation of indicators for assessing the impact on main sub-scenarios (natural, constructed physical, social, and economic), the effectiveness of interventions for prevention and mitigation, and the resilience built in communities.

Key words: management, risk, disasters, prevention, community resilience.

## Introduction

In the study of disasters, we have learned that the most complex and urgent action in the disaster

reduction cycle is precisely all that is related to risk management.

Many researchers and decision makers at different levels who are immersed in the popular area of disaster management create programs and projects without realizing the importance of having a good cognitive base, which is crucial to be able to effectively lead actions. Everyone wants to be involved in addressing existing risks without a full understanding of what it means or complete knowledge of the causes that produce them. The objective becomes the “what” without clarity about the “how.”

In the formulation of our prospective strategy, we argue for its primary components, which are seen as systemic actions that ensure prevention. From our point of view, this is the most effective method for reducing the probability that natural and man-made phenomena will continue to turn into disasters.

With pre-disaster scenario studies, we are guaranteed the proactive component of our strategy which is also a guarantee of the information needed to develop management strategies. However, it is useless to conduct countless studies if we do not make adequate use of their results. The “what to do” and the “how to do it” are, from our point of view, essential elements for the adequate treatment of disaster management at the local level. With comprehensive risk management at the local level (CRML), the proactive component of our strategy is defined along with the arguments for our prospective vision of “natural disasters.”

### Process

Our studies confirm that it is not possible to have a holistic risk approach without focusing holistically on its fundamental components —which involves risk calculation and vulnerability assessment, especially the factors that lead to this vulnerability.

Risk is a complex and dynamic function and it is difficult to model a probable future situation in the present. It is precisely because of this that we propose the recognition of the need for a prospective vision for analysis. This is the most complex component in the study of both natural and man-made disasters.

When risk is discussed, various conjectures are made, probabilities are calculated, and predictions emerge about possible impact. In reality, however, the main problem associated with risk —and because

of this, we have considered various points of view of international experts— is that it is a dynamic variable, and many strategies and policies (from prevention to development) try to treat it as a static, immobile variable. This leads to great errors in perception and treatment.

We defend the idea of looking at risk in a prospective way, as a function that can be characterized for a specific scenario through two fundamental attributes, which are:

1. Genesis
2. Tendency

From this perspective, risk can be seen in function of development as a vector variable. With “genesis,” we determine the cause and the factors that lead to it in the surrounding area-scenario system; and with “tendency,” we can analyze the effectiveness of disaster-related policies and strategies and characterize them as ascendant or descendant.

The tendency tells us where we are moving —towards development or towards disaster. If we are not aware of hazards and vulnerabilities are exacerbated, the tendency is for risk to increase. These reflections will undoubtedly allow us to project successful interventions for effective disaster risk management.

### Models For Strategic Disaster Risk Management

Risk management models have evolved over time as civilization has developed and expressed ongoing concern about finding appropriate ways to intervene in the problem. In the modern era, the models have grown out of a retrospective analysis. Tendencies that have developed in this area since the middle of the last century are the following:

- Descriptive models
- Cause-effect models
- Emergency models
- Predictive models (phenomenon vs. impact)
- Risk administration and management models
- Risk transfer models
- Prospective models

Currently, the last four models are being used or projected in interventions at the international level, generally in an independent fashion. In our country we work in coordination with our 160 municipalities on

risk management based on identified hazards that are seen as preludes to disaster.

As a research center, we are now working on prospective models, and this has led us to formulate a Strategic Management Model for Comprehensive Disaster Prevention. The goal of the model is to coordinate actions related to disaster and risk administration and management in a specific scenario, in order to ensure not only the physical wellbeing of people, but also to protect the environment, the economy, and society in general.

This model starts by recognizing three fundamental management phases for disaster risk administration. They are:

- Reactive Management
- Corrective Management
- Prospective Management

The following section will address the primary characteristics of each of these, in order to discuss their strengths and weaknesses, and especially to highlight the need to integrate efforts that allow real risk management to be achieved in our countries, communities, and peoples.

### 1. Reactive management (RESPONSE actions)

- This is the prevailing model in our region and our country.
- It is based on emergency and crisis management.
- It is effective when there is imminent danger.
- It is more applicable to slow-forming hazards like hurricanes.
- If quick, effective action is taken, it can minimize the impact of a disaster.
- It is based on contingency plans, response capacity, organization, planning, resources, and prior training.
- It has a temporary effect. When the hazard comes to an end, people return to living with the vulnerabilities and risks that existed previously.

**According to our organization model, the following elements are basic requirements for applying this model:**

- Pre-disaster scenarios studies that allow hazards to be estimated, vulnerabilities to be analyzed, and risk areas to be zoned.
- Political will that is expressed as an interest in saving people's lives.
- Community preparedness.

### 2. Corrective management (PREVENTION actions)

- It is based on the analysis of vulnerability, risk evaluations, and situational assessments.
- In this phase it is essential to identify types of vulnerabilities and the factors that lead to them.
- Vulnerability factors and related interventions are put in order according to their importance.
- A mitigation program is adopted.
- Corrective management is complex; it must be integrative, allowing adequate identification and treatment of the causes of risk.
- Generally, the scope is limited by economic barriers. However, the legal, organizational, and operational aspects do not require large amounts of resources to reduce vulnerability and have a significant influence on the scale of disasters.

### 3. Prospective management (FUTURE actions)

- This begins with planning for future scenarios (starting with the most real scenarios), classifying the exposure, analyzing probable paths, and addressing the need to respond to severe and catastrophic events in time.
- It requires prevention to be a part of development planning.
- It requires risk analysis to be part of programs and projects.
- Risk becomes a definitive part of economic feasibility analyses and analysis of investment processes.
- It allows to visualize how real scenarios are transformed over time into safe scenarios.
- It is one of the ways to consolidate sustainable development in our region and our country.



- It is a primary component for adopting development models.

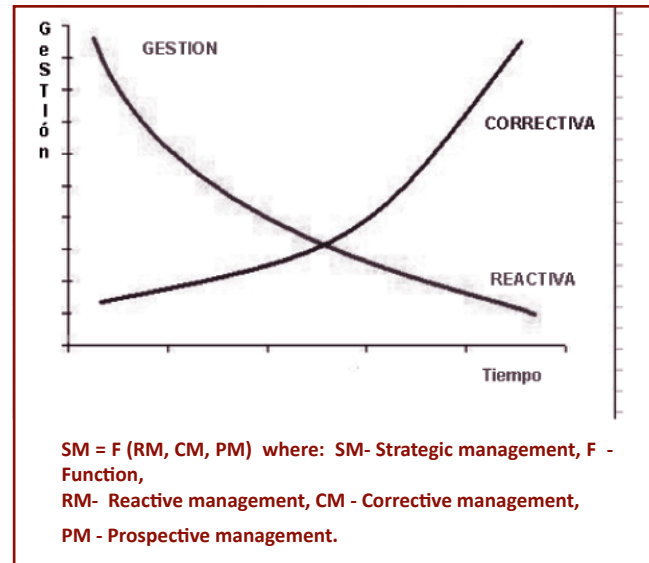
### We can summarize strategic management with the following expression:

In the figure below we can see the correlation that must be established between the various components of management. It shows how as corrective action increases, the demand for reactive management decreases. In other words, by investing in vulnerability and risk reduction in our communities, we will be able to minimize demand in emergency situations.

This figure shows the most important elements to be considered in the various phases as well as the various models used.

### Conclusions

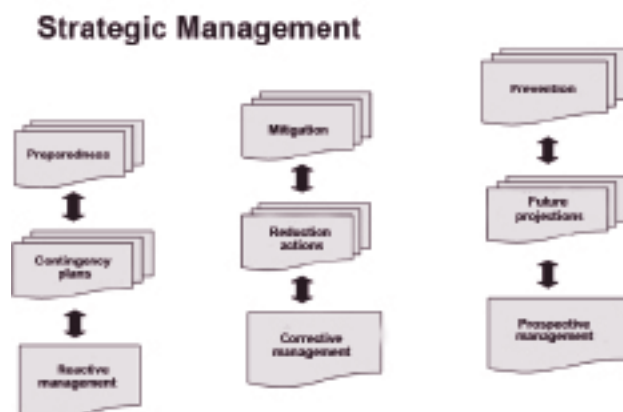
1. This research shows the contribution of Cuban science to disaster prevention and risk management programs in the Republic of Cuba.
2. Information and environmental management processes are pillars of comprehensive disaster risk management.
3. The design of a type of strategic management that integrates actions within a specific scenario allows more rationality, efficiency, and effectiveness in prevention and mitigation interventions.
4. Increased corrective management leads to a decrease in vulnerabilities and in risk areas. Then, there is less unsafe exposure and less demand for people to be evacuated, and so the demand



for reactive management will also decrease. In other words, by investing in vulnerability and risk reduction in our communities, we will be able to minimize demand in emergency situations.

### References

- CARDONA, Omar Darío. Estimación holística del riesgo sísmico utilizando sistemas dinámicos complejos. Available at <http://www.desenredando.org/public/varios/2001/ehrisusd/index.html>. Polytechnic University of Catalonia, Barcelona, 2001.
- GODET, Michel. De la anticipación a la acción. Manual de prospectiva y estrategia. Barcelona, Spain, MARCOMBO. S.A, 1993. 360 p.
- GUASCH, Fernando. CD-Rom of the leadership course for health, disaster and development managers, 2002 (Cuernavaca, Mexico). Pre-disaster scenario studies in the Republic of Cuba. Cuernavaca, Mexico, PAHO-WHO, National Public Health Institute of Mexico, 2002.
- GUASCH, Fernando. Studies of pre-disasters scenarios in the island of Cuba. In: Workshop on Promoting Best Practices for Natural disaster Mitigation in Small Island Developing States. Mauritius, October 27-29. TWNSO. TWAS. UNDP. 2005.
- GUASCH, Fernando. Estrategia prospectiva para la prevención de desastres a nivel local en Cuba. Thesis. Department of de Geosciences. ISPJAE. (2006). Havana, Cuba.
- LAVELL, Allan. Desastres y desarrollo: Hacia un entendimiento de las formas de construcción social de un desastre: El caso del huracán Mitch en Centroamérica. In:



Garita, N. Y J Nowalski. Del desastre al desarrollo sostenible: Huracán Mitch en Centroamérica. BID-CIDHS, 2000.

VEGA, Ibia and GUASCH, Fernando. Metodología para el diagnóstico situacional con fines de gestión del riesgo de desastres. PGRPD-CENAI. 2008.

For further information, please send an email to:

[pgrpd@cenais.cu](mailto:pgrpd@cenais.cu)  
[guasch@cenais.cu](mailto:guasch@cenais.cu)  
[ibia@cenais.cu](mailto:ibia@cenais.cu)



# The Central American Probabilistic Risk Assessment (CAPRA) initiative



## Introduction

**T**he Central American Probabilistic Risk Assessment (CAPRA) initiative seeks to enhance disaster risk understanding in the Central American region. It provides a Geographic Information System (GIS)-based platform of information on natural hazard risk, for disaster risk analysis and communication. CAPRA is a tool that enables decision-makers to manage risk at local, national and regional levels.

The primary CAPRA product is a series of risk maps. The CAPRA methodology determines risk in a

probabilistic manner, i.e. the intensity and frequency of occurrence of hazards over a period of time is taken into account. These risk maps present specific quantitative information on the potential losses a country, region, or particular city could face if struck by single or multiple hazards.

These visual representations of risk enable decision-makers to adopt a comprehensive approach toward disaster risk management: with the information CAPRA provides, decisions can be made a priori about prevention, mitigation and response to natural hazards.



Led by the Central American Coordination Centre for Disaster Prevention (CEPREDENAC), in partnership with Central American governments, the CAPRA initiative is supported by the United Nations International Strategy for Disaster Reduction Secretariat (UN-ISDR), the Inter-American Development Bank (IDB), and the World Bank.

### Probabilistic Risk Assessment

CAPRA applies probabilistic risk techniques to determine the intensity (severity) and the likelihood (probability) of occurrence of hazards such as hurricanes, earthquakes, landslides, volcanoes, or rainfall.

Probabilistic techniques employ the statistical analysis of historical datasets to assess potential hazard intensity, duration, and frequency across a country's territory. This multi-hazard information is combined with data on exposure and vulnerability of assets or population to determine a spatial estimate of risk, or potential losses. Risk is expressed in terms of human impact; damage to assets; and economic and financial losses, and it is measured with probability of exceedance or frequency of occurrence parameters.

The CAPRA software therefore quantifies risk according to a rigorous methodology, providing the disaster risk community with a common language for measuring, comparing or aggregating expected losses. Using probabilistic techniques, as opposed to deterministic analysis, ensures that the inherent uncertainties associated with intensity and frequency in model estimates are incorporated, providing more accurate information necessary to manage future disaster risk.

### Why use CAPRA?

CAPRA responds to a demand for increased disaster risk understanding in Central America. It is a communication tool that visually represents risk in order to facilitate decision-making at various levels and sectors.

Through the application of probabilistic modeling, CAPRA provides accurate risk information, and quantifies risk in useful metrics. Building upon the work of generations of disaster experts, CAPRA makes use

of existing initiatives and provides a common language for analysis and comparison of risk.

CAPRA goes beyond focusing on one sector: it can be applied at various levels, ranging from health and education to investment and development planning. CAPRA also offers various applications (discussed below), and moves away from black box models with "vendor lock in": the software architecture is open and accessible to the community.

At the core of CAPRA is the commitment to be an open and transparent information platform. At the data level CAPRA uses standard data formats established under the Open Geospatial Consortium (OGC) to build the catalogue of risk information, allowing for maximum inter-operability with existing systems. At the software level it allows users to build their own applications, using all or part of CAPRA, upon the platform, enhancing the functionality of the software.

The CAPRA initiative is embracing Web 2.0 technologies and the underlying premise of collaboration offering new ways to communicate and work together. All CAPRA hazard and risk reports are available online in a wiki form (a collaborative website set up to allow user editing and adding of content), providing a space for users to debate and pose questions about the CAPRA methodology through an online discussion forum ([www.ecapra.org/wiki](http://www.ecapra.org/wiki)).

In recent years, Geographic Information Systems (GIS) have allowed the public to display and manipulate geo-referenced data through tools such as Google Earth/Maps, Virtual Earth and WorldWind Java. CAPRA is using these 3-D models to communicate ideas and collect data in new ways. To overcome the critical challenge of data collection in Central America, CAPRA is exploring new technologies, such as high resolution aerial photography, satellite imagery and 'crowd sourcing.' An example of the use of crowd-sourcing to collect exposure data can be viewed on the wiki, in a risk assessment made for Bluefields, Nicaragua.

### CAPRA applications

Once risk has been determined, decision makers can use the various CAPRA applications to address the situation and engage in a comprehensive disaster risk management approach. CAPRA applications include:

- (i) a hazard assessment report for territorial planning
- (ii) a cost-benefit application for analysis of retrofitting projects
- (iii) a calculator of technical premiums for insurance

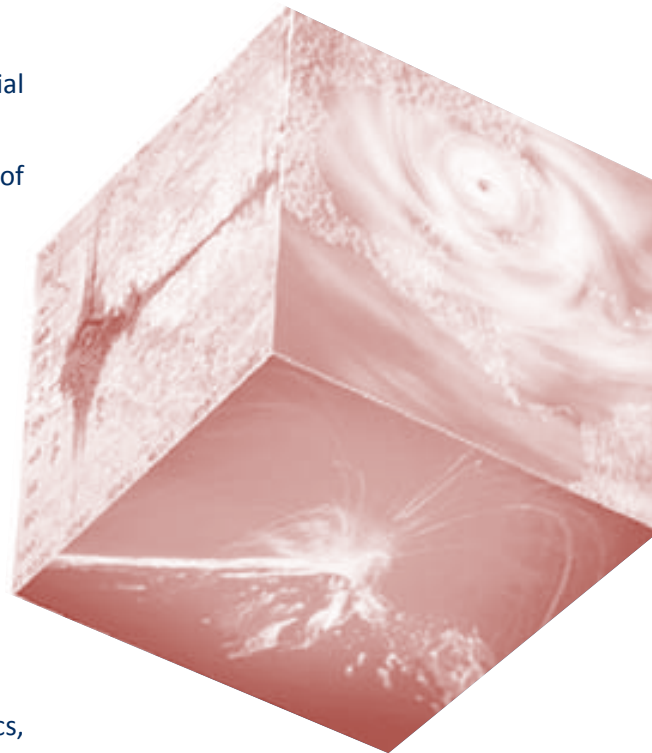
The CAPRA platform has the potential to assess the impact of climate change by using hazard models derived from climate, rather than historical data. For example, CAPRA could provide a risk evaluation of a climate change impact scenario using a model and future scenario projection from the Intergovernmental Panel on Climate Change (IPCC).

### The CAPRA community

CAPRA users range from technical experts, academics, government institutions, and emergency response organizations, to risk management consultants and decision-makers, a wide and far-reaching community.

The CAPRA initiative is engaging universities to work with CAPRA software and collect data. Scholarships are currently being offered to post graduate students to explore the potential of the CAPRA tools within the academic sector and especially to support graduate-student projects. The CAPRA initiative recognizes the importance of educating the current generation of professionals within the fields related to disaster risk and therefore welcomes students' contributions and initiatives to expand and improve its tools and applications

CAPRA, moving away from the standard single hazard analysis approach, provides a multi-hazard risk assessment based on probabilistic modeling, and taking into account vulnerability, exposure and damage. This risk information can be applied at various levels



and in different sectors including: health; education; housing; and planning. Using the CAPRA applications, decisions can be made to prevent, mitigate or respond to disaster risk. CAPRA thus provides a holistic risk management approach and creates a broad disaster risk management community.

### Conclusion

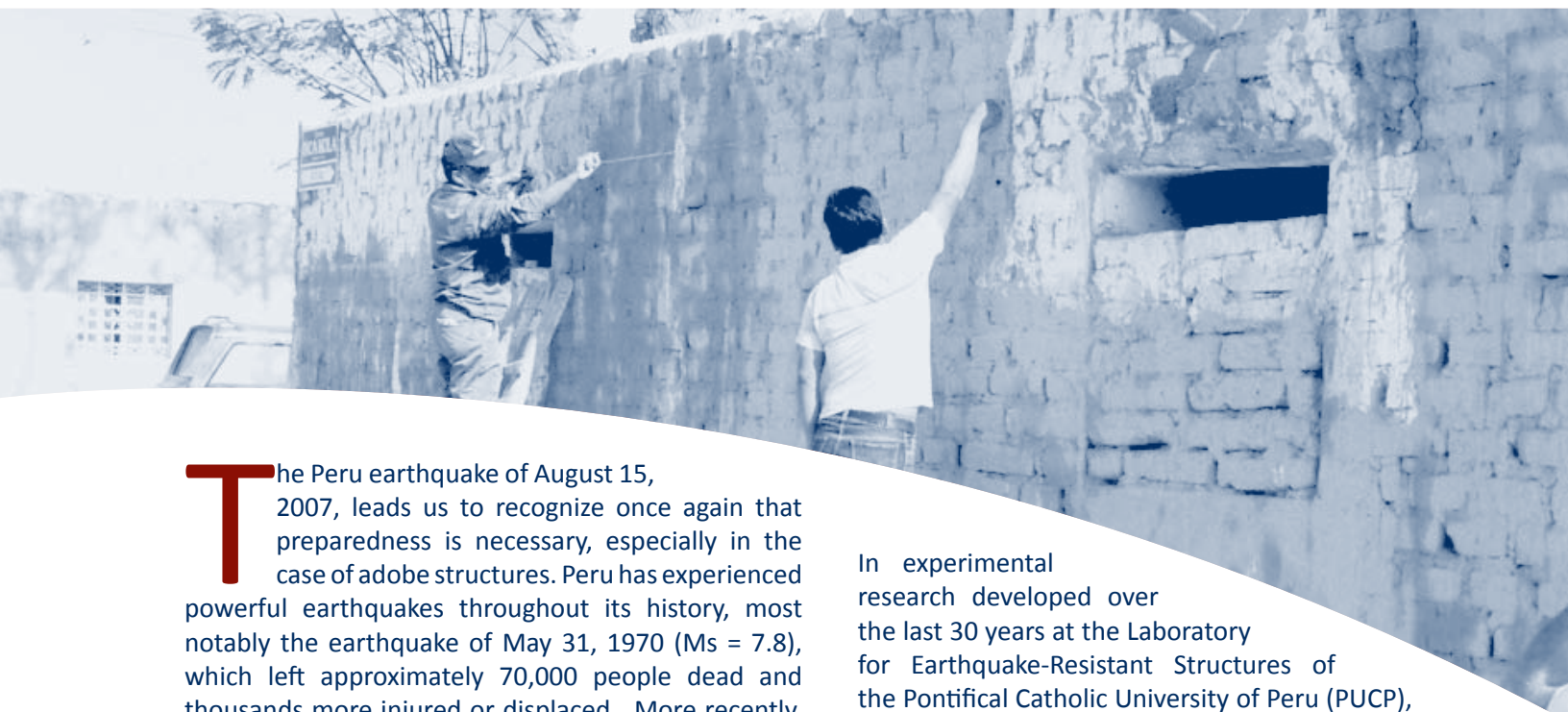
CAPRA is part of an ongoing effort to promote a proactive disaster risk management strategy in the Central American region. Ultimately CAPRA hopes to contribute to Central America's sustainable development by supporting a regional strategy that advances disaster risk evaluation and risk management decision-making across all sectors.

*For further information, please contact:*

*Emma Phillips*

*[ephillips@worldbank.org](mailto:ephillips@worldbank.org)*

# Earthquake Damage Prevention in Adobe Dwellings



**T**he Peru earthquake of August 15, 2007, leads us to recognize once again that preparedness is necessary, especially in the case of adobe structures. Peru has experienced powerful earthquakes throughout its history, most notably the earthquake of May 31, 1970 ( $M_s = 7.8$ ), which left approximately 70,000 people dead and thousands more injured or displaced. More recently, the earthquakes of Nasca in November 1996 ( $M_w = 7.0$ ) and of Atico-Arequipa in June 2001 ( $M_w = 8.4$ ) and the latest, on August 15, 2007 ( $M_w = 7.9$ ), have affected our coastal region (references 1 & 2).

As has been the case with past earthquakes, in this most recent event, many traditional adobe houses collapsed in Pisco, Chincha, Ica, and other towns, resulting in unfortunate human and material losses. These homes are extremely vulnerable due to the use of weak and poor-quality building materials, lack of reinforcement and maintenance, and poor construction, among other reasons. Despite this, the 2005 population and housing census indicates that over two million houses in Peru are built with adobe or tapial (mould for mud walls) and nine million people live in these structures. This leads us to the question: How can we help them?

While Peru has had technical standards for adobe since 1984 —renewed in 2000 (NTE E.080)— most adobe structures are built without consideration for the reinforcement necessary to withstand earthquakes. In contrast, very few homes had been equipped with such reinforcements and were therefore able to withstand the Pisco earthquake without damage.

In experimental research developed over the last 30 years at the Laboratory for Earthquake-Resistant Structures of the Pontifical Catholic University of Peru (PUCP), tests have shown that it is indeed possible to reinforce adobe houses to render them earthquake resistant.

“Seismic Reinforcement of Existing Adobe Housing in the Andean Countries” was a demonstration project of the International Decade for the Reduction of Natural Disasters (IDRND), sponsored by the United Nations at the end of the twentieth century. This project was carried out under the GTZ-CERESIS-PUCP Agreement, with financial support from GTZ in Germany and administrative support from CERESIS, to make adobe houses more resilient and malleable, thereby enabling the occupants to escape them and save their lives. The project stages included: 1) analysis of different reinforcements through seismic simulation tests in the Structures Laboratory of the PUCP; 2) installation of the reinforcements in 20 actual homes located in seismic areas of Peru in 1998 and 1999, work which was extended to other Andean countries; and 3) post earthquake evaluation of the effectiveness of the reinforcements (Ref. 3).

The first test took place with the earthquake of June 2001, in southern Peru ( $M_w = 8.4$ ). Six houses (three in Moquegua, two in Tacna, and one in Arica) held up extremely well, without a single fissure,



while neighboring houses were seriously damaged or collapsed completely. This was followed by the Tarapacá earthquake in June 2005 (Mw = 7.9) in northern Chile; once again, the house in Arica and the two in Tacna were unharmed.

Finally, the earthquake of August 15 2007 (Mw = 7.9) offered the third test of two pilot houses located in the Ica countryside. Both withstood the earthquake in perfect form, sustaining no damage, while neighboring houses tumbled or showed dangerous cracking.

The system of applied reinforcement consists of strips of welded mesh nailed and connected to the adobe walls and then covered with cement mortar to simulate beams and columns. This mesh is positioned at the corners of perpendicular walls, to fasten them, and along the top edges of walls to minimize the tremendous flexibility existing in the central area. The advantage is that these reinforcements can be installed in existing dwellings without affecting their foundations or their roofs and they are easily installed by local workers with very little training. The reinforcement manual and the limitations of the reinforcement system are available at the following reference [1] and [3].

What now remains is to spread word about this reinforcement technique and ensure that those living in such houses learn the lessons from the Pisco earthquake (and the preceding ones): traditional adobe houses crumble, while reinforced houses remain intact, at least during earthquakes similar to

those described in this article. As the popular saying goes, "An ounce of prevention is worth a pound of cure." During the launching of the GTZ-CERESIS-PUCP project, Alberto Giesecke, Director of CERESIS, referred to "vaccinating" houses: "Reinforcement protects your home just as vaccination protects your health."

Following the 2001 earthquake, techniques similar to the one explained here were used in the construction of 400 new and improved adobe homes in the highlands of the Andean area of Arequipa, work carried out by COPASA-GTZ, after completing experiments at PUCP, for which local workers were trained and an instructional work manual was put together.

Similar efforts are expected in the new situation created by the earthquake of 2007, given the magnitude of the destruction.

In conclusion, not only did the reinforced adobe houses successfully withstand the test of three actual earthquakes, but they did so without incurring any damage whatsoever. We are now faced with the task of publicizing what happened and working to convince the relevant authorities that the reinforcement system can be applied in a massive way in adobe dwellings to prevent further misfortune.

*For further information, please contact:  
Daniel Quiun and Ángel San Bartolomé  
Professors, Engineering School, Civil Engineer Department  
Pontifical Catholic University of Peru*





## Reference

[1] Tavera H, Salas H., et.al. "El terremoto de Arequipa del 23 de junio del 2001." Preliminary report, Geophysical Institute of Peru. Lima, June 2001.

[2] Tavera H, Bernal I., Salas, H. "El Sismo de Pisco del 15 de Agosto 2007 (7.9 Mw) Departamento de Ica Perú." Geophysical Institute of Peru. Lima, September 2007

[3] <http://www.ceresis.org/proyect/padobe.htm>, 2000.

[4] San Bartolomé A., Quiun D., Zegarra L. "Effective System

for Seismic Reinforcement of Adobe Houses, 13th World Conference on Earthquake Engineering, Vancouver B.C., Canada, August 1-6, 2004, paper No. 3321

[5] Website PUCP: <http://blog.pucp.edu.pe/albanileria>, 2007

[6] Chuquimia, E. "Manual de construcciones sismo resistentes en adobe" GTZ-COPASA-Regional Government of Arequipa, PUCP, Arequipa, 2005.



# Management of disasters caused by meteorological events and climate change in the Peruvian Andes: MAREMEX Mantaro project



Photo: Wikipedia Commons

## Introduction

**T**he Andean region is one of the most vulnerable to natural phenomena, and Peru in particular is vulnerable to earthquakes and extreme meteorological events (ISDR, 2009). Given the reality of climate change and socio-economic trends, it is likely that this vulnerability will increase in the future (IGP, 2005b). For this reason, while it is necessary to do more research to reduce uncertainties related to the potential effects of climate change, one efficient strategy is to take measures now to adapt to these effects and cope with recurring phenomena that are already affecting the population and its activities (IGP, 2005a).

Peruvian people and their leaders are aware of the impacts of climate-related phenomena, but neither the general population nor the authorities has

sufficient scientific and technical knowledge to be able to take action aimed at reducing their negative impact. One example is drought. Since several factors influence monthly rainfall in the Peruvian Andes (IGP, 2005b), droughts are difficult to predict. Even when recurrent and routinely predicted events like frosts occur, institutions working on these issues carry out few if any prevention activities. This is due in part to the lack of sufficient economic resources, but it is also because more technical knowledge is required in order to justify, plan, coordinate, and implement these actions.

The Mantaro river valley, located in the central Andean region of Peru, is one of the primary agricultural areas of the country and is home to the largest city in the Peruvian Andes, Huancayo.



The Junín region, where the valley is located, is one of Peru's most advanced areas in terms of disaster and climate change management policies. This is true to a large extent because one of the first comprehensive studies on climate change vulnerability was conducted in the Mantaro river basin. The study was led by IGP with the collaboration of various local institutions between 2003 and 2005, as part of the program titled "Strengthening National Capacities to Manage the Impact of Climate Change and Air Pollution" (PROCLIM). The program led to the establishment of a technical group on climate change made up of representatives of a number of institutions in the region. Thanks to the active participation of the Junín regional government in the project and the work of the technical team, this region was one of the first in the country to be made aware of issues related to climate change. Currently, and in part because of the laws in effect, the Junín regional government needs to implement a disaster management system. However, its available staff and experience in this type of work is limited.

In this context, the Geophysical Institute of Peru (IGP) has begun a project called "Management of Disasters Related to Extreme Climate Conditions (drought, frosts, and heavy rains) as a Way to Adapt to Climate Change in the Mantaro Valley" (MAREMEX Mantaro). The project, to be carried out in 2009-2011, is financed by the International Development Research Center (IDRC) of Canada and is being developed in close collaboration with Junín's regional authorities and the provincial government of Concepción in the same valley. It is possible that it will be coordinated with district governments and farming communities as well.

### Goals

The main goal of the project is to strengthen what is now a very weak capacity to handle and manage risks when high-impact extreme meteorological events like drought, frosts, and heavy rains occur in the region. In addition to the obvious immediate benefits this would bring to the region, the hope is that risk management will also decrease vulnerability and improve the capacity of the urban and rural population of the Mantaro valley to adapt both to extreme events and to possible climate-related changes.

The general goal will be achieved through four specific objectives:

- a. Strengthen and conduct more in-depth studies on the causes, occurrences, and impact of frost, drought, and heavy rains in the region.
- b. Identify the key actors involved and evaluate the current capacity of Mantaro valley residents to manage disaster risk caused by extreme climate-related phenomena.
- c. Develop a comprehensive plan to manage risks and adaptation strategies for facing frost, drought, and heavy rains in the Mantaro valley, with the participation of local authorities, regional governments, communities, non-governmental organizations (NGOs), and other relevant actors.
- d. Strengthen local and regional institutions and disseminate the results of the project to institutions, scientific organizations, and the general public by creating or strengthening capacity among local researchers and groups on issues related to adapting to climate change.

### Work strategies

This is a research-action project since it includes a strong component of basic research on the physical aspects of extreme meteorological phenomena and its impact on human systems, but also aims to establish a disaster management system that brings together institutions, authorities, and the population. It is innovative in that it will work at the same time in both urban and rural environments that are vulnerable in different ways to the same events. From its inception, the project will also take gender and water resources into account as cross-cutting issues.

The project will draw on IGP's experience in climate and risk management studies and its ties with institutions in the region in order to ensure inter-institutional and multi-disciplinary participation in the implementation of the project. The project will establish a strategic partnership that seeks the involvement of actors

at every level: decision-makers (regional and local governments etc.) research-action institutions (public and private organizations, NGOs, etc.), and beneficiary communities (representatives of civil society). In this way it will seek to:

- Create common working spaces among decision makers, researchers, and project beneficiaries.
- Strengthen local, regional, and national capacity for participating in interdisciplinary research.
- Adopt effective disaster management policies in the region.

The work strategy will also include the recovery of ancestral knowledge; the promotion of action-focused research through national university students doing thesis work; the use of gender-related issues as pillar for the development of a disaster management system; and the widespread dissemination of project results to the international scientific community, government institutions, and the end users of the system.

In this context, the main goal of this project is similar to that of the Hyogo Framework for Action, but applied to a limited region. It is hoped, however, that the results and experiences gained in the Mantaro valley will be applicable to other regions so that MAREMEX projects can be implemented throughout the country.

### **Bibliography**

IGP, 2005a: Diagnóstico biofísico y socioeconómico de la cuenca del Mantaro en el contexto del cambio climático. Fondo Editorial CONAM. Lima.

IGP, 2005b: Vulnerabilidad actual y futura ante el cambio climático y medidas de adaptación en la cuenca del río Mantaro". Fondo Editorial CONAM. Lima.

ISDR 2009: Reporte de Evaluación Global bianual sobre Reducción de Riesgo de Desastres.

For further information, please contact:

Geophysical Institute of Peru  
E-mail: [amartinez@geo.igp.gob.pe](mailto:amartinez@geo.igp.gob.pe)  
Website: [www.met.igp.gob.pe](http://www.met.igp.gob.pe)

Photo: Wikipedia Commons





# The PREDECAN Project: Supporting Disaster Prevention In The Andean Community



Photo: PREDECAN

**W**ith the increase in economic and human losses and the need to mobilize resources to rebuild disaster affected areas, the subject of risk prevention and management has taken on greater importance in the Andean countries, both in prospective terms and in response to a series of intense events. A complex territory where diverse natural, socio-natural, and man-made threats converge in a socioeconomic context characterized by high levels of poverty and social exclusion, the Andean subregion has experienced more than 57,000 disasters in the last 30 years, with thousands of casualties, and hundreds of thousands of surviving victims.

The recurrence and severity of the disasters experienced revealed the need to include the issue in the countries' national agendas, since such disasters affect the development of the impacted areas and constrain and/or delay achievement of social well-being goals established by the governments and development agencies.<sup>1</sup> In view of these challenges, what advances and contributions were achieved by the Project to Support Disaster Prevention in the Andean Community (PREDECAN)?

After nearly five years of supporting risk management in

the Andean Community, the PREDECAN Project ended, sharing valuable experiences with its implementers and beneficiaries in each country, based on the firm belief that capacity to learn is the greatest kind of wealth. So it is important to summarize the process that has given us some certainties, new questions, and interesting lines of action to be further examined.

In 2003, the signing of an agreement between the European Commission and the Secretary General of the Andean Community, in association with the Andean Committee for Disaster Prevention and Response (CAPRADE) was a step toward developing the PREDECAN Project as a supporting element in implementing the prevention policies set forth in the Andean Strategy for Disaster Prevention and Response (EAPAD), which was approved in 2004 by the Andean Council of Foreign Ministers.

It is in this way that PREDECAN sought to contribute to reducing the vulnerability of people and property exposed to natural hazards and risks, and to promote sustainable development in the countries of the Andean community. Its specific goal was to improve services in the area of risk management by strengthening national policies, institutions, and the coordination of activities in these areas.

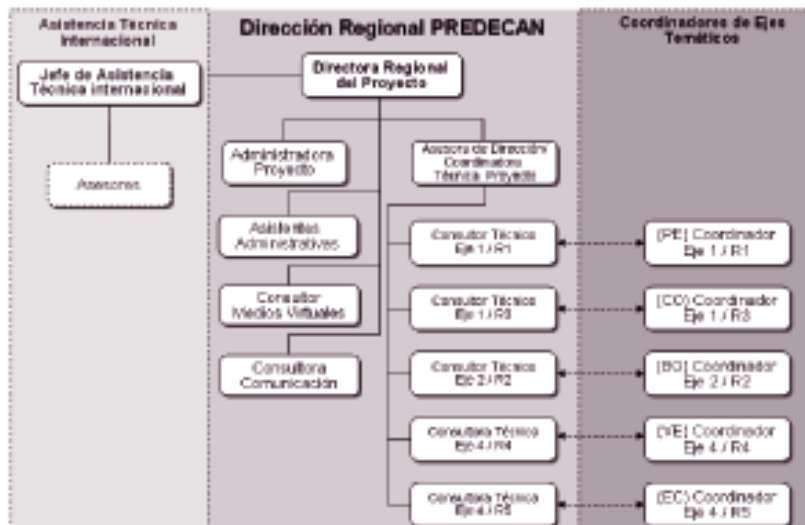
<sup>1</sup> Andean Strategy for Disaster Prevention and Response, version approved during the thirteenth meeting of CAPRADE.



## Organization

The project's managing body was established in March 2005, made up of a director, a person in charge of international technical assistance-related issues, an advisor and a subregional administrator. It also had the valuable support of the technical results coordinators and three administrative assistants, as well as other high-level professionals, including international consultants and specialists. The contracting and management of international technical assistance was handled by the consortium formed by World Development Consultants and Infrastructure &

Gráfico N° 1: Organización de PREDECAN al nivel subregional



## Lines of Intervention

PREDECAN operated for four and a half years, with financing of 12.5 million Euros, of which the European Commission contributed 9.45 million and the participating countries (Bolivia, Colombia, Ecuador, Peru, and Venezuela) contributed the remaining 2.95 million Euros. In keeping with its philosophy of being a facilitating project, PREDECAN accompanied and assisted CAPRADE in its mission to implement the Andean Strategy for Disaster Prevention and Response.

The continuous training processes promoted and facilitated by PREDECAN – which reached nearly 8,000 people, most of whom represent institutions and civil society at the subregional, national, and local levels – have contributed to developing a comprehensive approach to risk intervention that seeks, in a parallel fashion, to avoid generating new risks, reduce existing risks, and strengthen capacity to respond to disasters.

Ecology, Ltd., both from Spain, and BETA Studios and the Autonomous Province of Trento, Italy.

PREDECAN's results were based on the five thematic axes articulated in the Andean Strategy for Disaster Prevention and Response (EAPAD), which in turn were based on the priorities identified by each country. National coordinators were then appointed to coordinate and solve technical and methodological issues, as well as the assistance required by each country during the execution of the project, all in direct and ongoing coordination with the technical results coordinators.

Along these lines, PREDECAN organized its actions around five results that correspond to the thematic axes outlined in the Andean Strategy, in order to make its proposals more viable and improve services in the area of risk management.

## Result 1: National Policies And Organization

PREDECAN supported the Andean countries in the areas of organization, policy development, strategic planning, legal frameworks, and in the search for financial resources related to disaster prevention and response and risk management. It also supported the institutional consolidation of CAPRADE, as a space for coordinating joint actions and mutual support for disaster prevention and response and risk management, through the establishment of common policies, the exchange of experiences, and the creation of thematic and institutional networks.

With the goal of making risk reduction a national and local priority with a strong institutional, legal, and

Gráfico N° 2: Correspondencia entre Ejes Temáticos de la Estrategia y Resultados de PREDECAN

Eje Temático No. 1	Fortalecimiento de la Institucionalidad y de la Capacidad a Nivel Subregional Andino, Nacional y Local	Resultado 1	Sistemas y Políticas Nacionales de PAD de acuerdo a lineamientos consensuados a nivel de la Subregión Andina	RS
		Resultado 3	Incorporación la Gestión de Riesgo en la ordenación territorial y planificación del desarrollo general y sectorial	
Eje Temático No. 2	Investigación y Conocimiento - Identificación, Evaluación y Monitoreo de Riesgos	Resultado 2	Conocimiento del riesgo y Sistema de Información de Prevención y Atención de Desastres	Proy. Piloto en Gestión del riesgo
Eje Temático No. 3	Fomento de una Cultura de Prevención con Participación Social	Resultado 4	Concientización, conocimiento sobre Riesgo y la participación en su Gestión	
Eje Temático No. 4	Reducción de factores de Riesgos subyacentes	Resultado 3	Incorporación de la GR y la Adaptación al cambio climático en el sector agropecuario	
Eje Temático No. 5	Asistencia Mutua en Casos de Desastre (Red)			

financial basis, the Strategic Agendas for Strengthening Risk Management in each country were developed in a participatory manner. Colombia and Ecuador incorporated these agendas into their National Development Plans.

To address the issue of national platforms and systems within each country, PREDECAN used process analysis to look at organizational strengthening and institutional coordination for risk management with different scopes in each country. This analysis generated recommendations for providing guidance and improving their processes. PREDECAN also trained national officials from CAPRADE and other entities in strategic planning and risk management monitoring efforts in each country, as well as in identifying financial protection options in case of disasters by analyzing different alternatives at the subregional and country-wide levels.

One important advance that CAPRADE institutions achieved with the support of PREDECAN was in terms of updating and harmonizing the Andean Strategy for Disaster Prevention and Response with the international policies set forth by the UN in the Hyogo Framework for Action, approved by more than 160 nations, including the Andean countries, in 2005.

These activities were possible with the technical support of three international consultants – all highly

regarded professionals with distinguished careers and international renown – in the following areas: conceptual and organizational aspects, processes, finance, and risk transfer mechanisms.

## Result 2: Information And Knowledge

PREDECAN supported CAPRADE in strengthening national and subregional capacities with regard to mechanisms for managing information, policies, and effective and timely interventions to reduce and control the adverse effects of hazardous phenomena, with the aim of reinforcing decision-making processes and risk management activities.

For this reason, the Andean Information System for Disaster Prevention and Response (SIAPAD, by its Spanish acronym) was conceived and designed using an integrated, distributive, standardized, and dynamic approach. SIAPAD is able to adapt to new supplies of information generated by institutions to support risk management, including the needs and demands of users.

SIAPAD has three tools for accessing and using information: GEORiesgo, a network of four national portals with mapping and documentary information; BiVa-PaD, a network of virtual libraries for disaster prevention and response, with more than 40 participating bodies, which allow the collection,

organization, and dissemination of documentary information; and DesInventar, a portal that facilitates consultation and analysis of the effects of disasters, in formats such as tables, graphs, and thematic maps.

As part of this effort, PREDECAN supported national initiatives to standardize data, trained more than 550 staff in charge of managing information, and digitalized more than 4,000 documents, more than 200 multimedia resources, and a directory of more than 800 institutions and organizations. This information served as input for the creation of a hazard, exposure, and risk Atlas for the countries of the Andean subregion.

A key element for this result was the contribution of a consultant from the subregion who supported the area of risk awareness for the development of the Atlas, as well as a team of two national consultants in each country.

### **Result 3: Planning And Development**

This result aimed to help make disaster risk a relevant topic in development decision-making processes, so that measures are incorporated to prevent or reduce disasters.

For that reason PREDECAN conducted an analysis of the advances in incorporating risk management as a public policy priority for local, national, and subregional development, through the creation of guidelines and methodological guides. These were incorporated into practices related to land use/zoning, planning, and development, as well as for measures for adapting to climate change in the agriculture and livestock industry, and strategies for their implementation.

PREDECAN also supported pilot projects on disaster risk assessment methodologies and analysis, which included capacity building and practical training for the stakeholders involved in these projects at the local and national levels.

This group of activities benefited from the participation of international experts who helped shape the concept of safety in the location, construction, and operation of investment projects to ensure sustainable use of land in the countries of the Andean Community.

### **Result 4: Education And Communication**

One of PREDECAN's main tasks was to increase levels of awareness and knowledge about risk management. This is essential to ensure that different actors (from both institutions and civil society) have access

to information for decision-making and for citizen participation with regard to risk management-related issues.

Toward this end, PREDECAN established a Virtual Network of Educators and Communicators for Risk Management, which currently boasts 3,200 subscribers. In the area of higher education, PREDECAN supported the formation of an Andean Network of more than 32 universities on risk management and climate change, with the aim of designing and conducting research projects and supporting academic programs.

PREDECAN also helped establish guidelines and policies for incorporating risk management into school curricula and organized a series of national and subregional workshops to raise awareness among more than 350 communicators about the social focus of risk management. Additionally, the Andean Subregional Journalism Competition on Risk Management and Disaster Prevention and Response helped generate a greater number of articles on the subject.

In order to get a better sense of the focus and type of news generated about risk management, PREDECAN conducted an analysis of journalistic coverage on issues related to risk management in online newspapers in the Andean Community. As a result, it promoted innovative communication strategies through the publication of a document called Public Journalism for Disaster and Risk Management, which was an analysis of various representations of disasters in the news media, the actions of social change that require a new journalistic focus to address risk management and sustainable development as an informational frame of reference.

Through these actions, PREDECAN promoted a strategy for raising awareness, training, and education about risk management, which also included the development of educational and communications materials such as the five micro radio programs for the audio documentary series titled *Con el Riesgo Ni de Riesgo* (With or Without Risk).

### **Result 5: Participation In Local Risk Management**

Within the framework of CAPRADE's activities, the PREDECAN project promoted the strengthening of local capacity for comprehensive risk management, which included the exchange of information, decision-making processes, and the implementation of demonstrative projects.



To achieve this, PREDECAN prioritized two areas of focus: participatory pilot projects for local risk management in four municipalities within the subregion; and the identification, systematization, and dissemination of significant experiences that yielded lessons learned for local risk management.

The four pilot projects were implemented in San Borja, in Bolivia; Los Patios, in Colombia; Puerto Viejo, in Ecuador; and Calca, in Peru. They sought to articulate and put into practice, on a local scale, the different criteria and tools developed with the national institutions in the areas of policy, organization, information, education, and communication. Thanks to the commitment of the local authorities, the support of national and regional entities, and the facilitation of various non-governmental organizations, the concepts of safety and sustainability in development processes were infused into these projects. Additionally, capacity for local risk management was strengthened by undertaking studies about risks, and instruments for development planning, land use, and emergency management at the municipal, school, and community levels.

Along these same lines, the Andean competition called “Local Development Policies and Practices Related to Disaster Risks: Identifying Significant Experiences in the Countries of the Andean Subregion” gathered 229 experiences from the subregion (63 from Bolivia, 63 from Colombia, 42 from Ecuador, and 61 from Peru). The experiences of the 16 finalists (four per country), as well as those of the four pilot projects, were systematized and published, allowing for the dissemination of lessons and processes in the field of risk reduction promoted by the authorities, social organizations, and the community at large.

One aspect worth highlighting was the creation and strengthening of a Technical Accompaniment Committee for the pilot projects in each country, with the participation of CAPRADE, scientific bodies, and various government ministries from each country, as well as with international technical assistance from the Autonomous Province of Trento, Italy.

### Colophon

The achievements of the Support Project for Disaster Prevention in the Andean Community (PREDECAN), as CAPRADE’s facilitating body, would not have

been possible without the participation of a number of institutions responsible for disaster prevention and response systems: the Secretariat for Risk Management; planning departments; ministries of foreign affairs, the environment, housing, agriculture, economy and finance; civil defense organizations and scientific/technical institutions. Additionally, there was participation of the academic sector (both at the basic and university levels), non-governmental organizations, municipalities, and especially international cooperation agencies such as the European Commission’s Humanitarian Aid Office and its Disaster Preparedness Program (DIPECHO). All of these actors played a pivotal role in promoting the results we see today, and it was thanks to their support that such an intense effort was undertaken to build a future toward effective disaster risk management in the Andean subregion. All this contributes to sustainable development as an effort of the Andean Community countries in the context of their integration process.

PREDECAN based its work on the words of the former UN Secretary General, Kofi Annan, who stated that, “More effective prevention strategies would not only save tens of billions of dollars, but hundreds of thousands of lives as well. Funds currently spent on intervention and relief could be devoted to enhance equitable and sustainable development instead, which would further reduce the risk of wars and disaster. Building a culture of prevention is not easy, however. While the cost of prevention has to be paid in the present, its benefits lie in the distant future. Moreover, the benefits are not tangible; they are wars and disasters that do not happen”<sup>2</sup>.

It is essential at this time to maintain a stable and ongoing commitment to continuing the implementation of the Andean Strategy for Disaster Prevention and Response. The challenge now is to start exploring the paths proposed during these last few years. Each institution and each professional must make an effort to increase their level of awareness and face the new challenges that will arise along the way. And although there is still much left to do, the work that has been done thus far has helped to lay the foundation and create the tools needed for different social actors to work in a joint and articulated manner on behalf of the most vulnerable population in the Andean subregion.

<sup>2</sup> Kofi Annan, “Facing the Humanitarian Challenge: Towards a Culture of Prevention”, UNGA, A/54/1. Abril de 2006.

# Project for Early Recovery through Improved Techniques in Small Animal Production



Photo: UNDP

**T**he country of Ecuador is highly vulnerable to various natural phenomena. In the last few years, it has experienced floods, volcanic eruptions, and earthquakes that have caused disasters of varying levels of severity. As part of its comprehensive vision for risk management, the United Nations Development Program (UNDP) in Ecuador is focusing on early recovery processes that can be implemented immediately after a disaster occurs.

During and immediately following a crisis, national actors and members of the international community focus primarily on meeting the urgent basic needs of the affected population. Human lives are at risk and immediate actions are needed to minimize damage and restore order. From the very first stages of a humanitarian emergency, however, some things need to be done that go beyond basic measures to save lives. These include laying the groundwork for a sustainable recovery and a return to a longer-term development.

The focus must be on reestablishing the national capacity to have a safe environment, offer services, restore livelihoods, coordinate activities, prevent a reoccurrence of the crisis, and create the necessary conditions for future development. The goal of early recovery work is to generate sound, self-sustaining

national processes that will contribute to recovering after a crisis.

One of the most basic aspects for creating the conditions necessary for long-term recovery is the re-establishment of employment sources and means of production.

During the last two years, the UNDP Risk Management Unit in Ecuador has been implementing various projects aimed at helping people recover their ability to make a living. Based on the belief that “action is the result of knowledge” and that successful experiences should be promoted and publicized, the unit has decided to publish a series of good practices used in Ecuador for helping people to begin income-producing activities after a disaster.

This first report presents the results brought about in the first phase of a project for Early Recovery through Improved Techniques in Small Animal Production, which was carried out with populations affected by the ash that fell after the eruption of Tungurahua Volcano.

<sup>1</sup> Jeannette Fernández, documento “La recuperación temprana”, 2008.

<sup>2</sup> Guía de orientación sobre Recuperación Temprana, IASC, 2008

<sup>3</sup> Cita de Thomas Fuller

## Background and rationale

Tungurahua Volcano, located in the eastern inter-Andean valleys of Ecuador, has been highly active since 1999 and has erupted several times. The ash that was hurled from Tungurahua damaged agricultural production in the area and had a very negative impact on the quality of life of the population.

Because farmers lost much of their income source after the eruptions, the municipality decided to work in partnership with UNDP to seek alternatives for diversifying production. One good alternative it found was raising small animals.

The target groups for this project are two beneficiary organizations from the cantón of Cevallos. They have 19 and 22 members, respectively, and have traditionally worked in family-scale farming, fruit production, and day labor. Volcanic ash that fell on the area negatively affected their livelihoods and forced them to look for other forms of subsistence. The establishment of community micro-enterprises that create alternatives for raising and selling small animals has been important for the peasant farmer economy of the area.

## Description

Two pilot projects for raising pigs and guinea pigs have been established with the goal of turning them into training centers for the beneficiaries. The idea is that people can move towards a technical breeding system that can be duplicated or repeated in each of the existing units.

The pilot projects are designed to become supply centers for pigs and guinea pigs of high genetic quality, providing strong breeding stock to the local market in the future. At the same time, marketing processes will begin in order to sell meat and other products with added value. This will compensate for the lack of work in farming, reactivate the economy, and improve the living conditions of small producers.

Each unit has a certain minimal system in place for technical, reproductive, sanitary, nutritional, and other types of management, and this has allowed them to reach favorable rates of various kinds.

## Goals

### Primary goal:

- To implement pilot projects for raising small animals in two production associations of Cantón Cevallos. The projects will help beneficiaries develop socially and economically and can be duplicated by other groups with the direct support of the municipality.

### Specific goals:

- To promote the reactivation of the producers' economy in the cantón, which has been harmed by periodic ash fall, and provide production alternatives.
- To help each member of the organizations gain new information and develop new skills.
- To provide direct field training for producers by holding zoo-technical practice sessions and demonstrating the techniques used.

## Results

Results are quite encouraging and positive. They have demonstrated the effectiveness of the project and have generated good practices that can be repeated in other similar places in the area.

- The diversification of animal production and a reduction of the economic vulnerability of many people who have been exposed to the negative effects of volcanic ash fall on agriculture and livestock.
- A total renovation of the production unit.
- A change in people's attitudes about the technical management of animals.
- The replication of acquired knowledge.
- Current management of species that is rational and sanitary.
- Training sessions on production-related topics so that people can advance economically.
- Visits of organization to the production center. This has helped establish differences between the systems implemented.



The first stage of the project was supervised on an ongoing basis by the UNDP. In the second phase, the municipality (which now has new capacities) will be in charge of managing and supervising the process to provide other interested associations with the same kind of support that was given during the first phase.

### Future prospects

- The sustainability of the projects is guaranteed, on the one hand, by the demonstrated production and reproduction levels. But it is also assured because there is vast market potential in the area for this kind of production. Supply is low and must be increased in the future to meet current needs.
- The two units are on their way to becoming comprehensive training centers for producers in the near future. The management quality and measurable results obtained by the beneficiaries in charge of the project show that the units are also ready to become centers for meeting local demand by supplying high-quality breeding stock.
- These units have become models that other producers can learn from when they have the opportunity to visit us.
- The municipality is designing a project to establish a meat-processing plant that will give

The photograph below shows the changes made in the beneficiary communities and in their methods of production.

#### Contact details:

*Project information: Bayardo Constante,  
Mayor, Cantón Cevallos*

*bconstante@cevallos.gov.ec*

*UNDP: Jeannete Fernández, National Risk Management  
Advisor*

*jeannete.fernandez@undp.org*

*This project, the first phase of which has now been finalized, was derived from the effects of ash fall of the Tungurahua Volcano. New submittals demonstrate other good practices of recovering livelihoods, derived from the negative effects of annual flooding along the Ecuadorian coastline.*

*Borja Santos Porras, Risk Management Unit,  
UNDP - Ecuador  
borja.santos@undp.org*

Photo: UNDP



## Winds of Change in the Modernization and Development of Civil Protection in Chile

**T**he National Emergency Office (ONEMI)—which belongs to the Chilean Ministry of the Interior—is undoubtedly the most thorough and far-reaching process to modernize and strengthen national disaster prevention and management since the office was created over 35 years ago.

Government support for this process has been fundamental, giving a strong boost to the modernization and development of civil protection in Chile. With a clear prevention component, concrete steps are being taken to enable the country to progressively shift towards effective risk management.

This phase in ONEMI's institutional advancement has been possible thanks to a proposal that the Office started developing in mid-2006. The proposal was

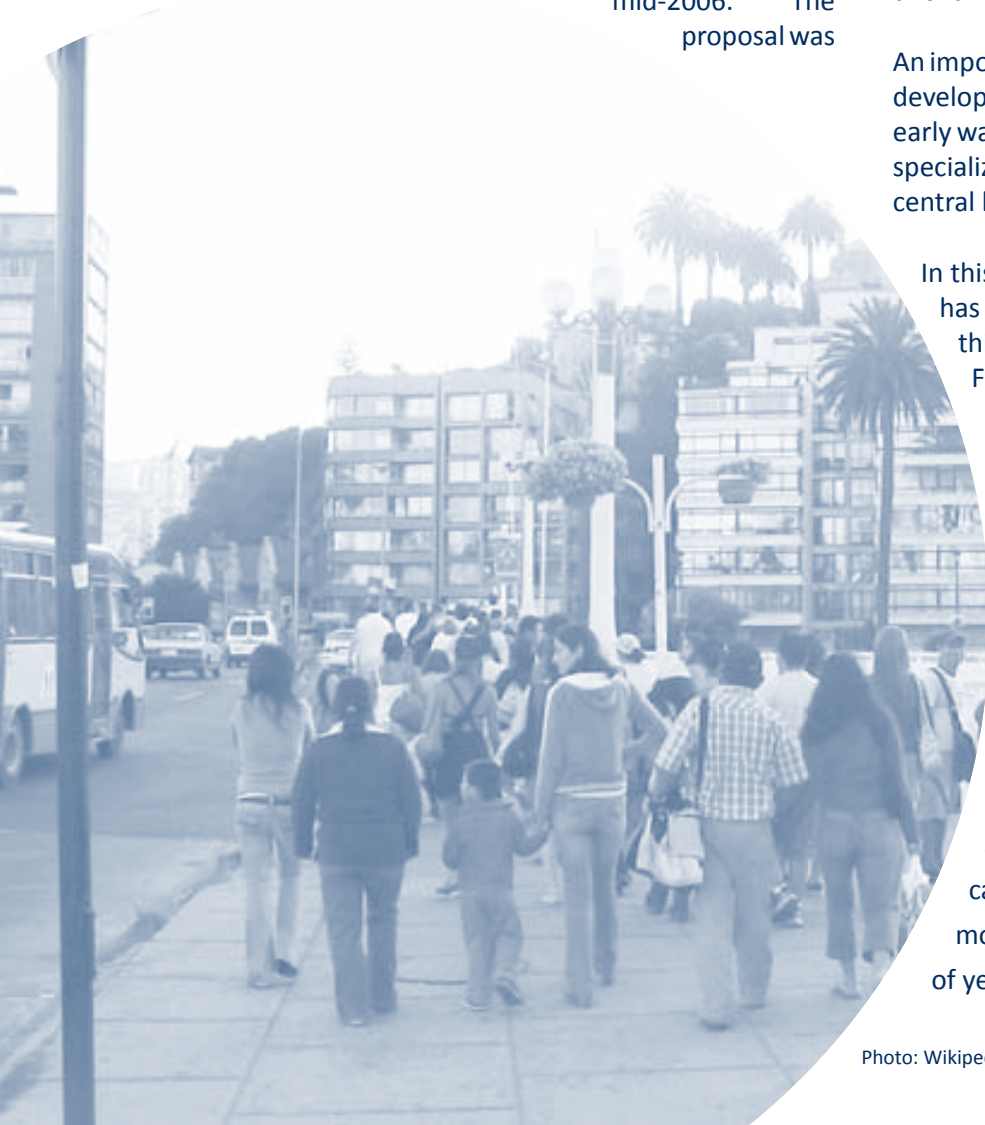
submitted to authorities of the Ministry of the Interior in June 2007, who approved and forwarded it to the Ministry of the Treasury. As a result, ONEMI received a new budget that was increased by 118% in 2008, and an additional 54.77% in 2009.

As part of the geographic decentralization process, since 2008, ONEMI has had regional branch offices throughout the country, with trained human resources, long-range vehicles, and a growing telecommunications and facilities network. This is a significant achievement for such a large country, which is divided into 15 administrative regions from north to south. This progress has strengthened the institution's organizational structure by effectively extending its lines of action to directly cover the entire country, keeping in mind that years earlier ONEMI performed this function from the central level.

An important aspect tied to these changes has been the development of technical skills for risk assessment and early warning, through the aforementioned increase in specialized human resources in ONEMI, not only at the central level, but regionally.

In this short period of time, clear, concrete progress has been made in modernizing the institution. In this regard, ONEMI's national director, Carmen Fernández, stressed that the changes being made are strengthening the work of civil protection around the country, with a focus that is primary and effectively preventive.

Ms. Fernández stated that “modernizing this service also involves upgrading the national early warning system around the country, as part of the continuous improvement of risk management. However, this only has meaning through its links to a system-wide, continuous process of community involvement, focusing on the sectors most vulnerable to emergencies, disasters and catastrophes, which is definitely the core motivation behind the process we began a couple of years ago.”



### Primary strategic lines

If we assume that the role of ONEMI – in real terms – is to manage uncertainty in dealing with the behavior of nature, this technical service in charge of civil protection in Chile focuses its work on actions that effectively enable providing people with certainty. Along these lines, the modernization process has been dealing with strengthening critical areas in risk management. This has included restructuring the national Early Warning Center (CAT), which has the mission of continuously and systematically monitoring different risk scenarios, to gather, assess and disseminate information on potential or real emergencies or disasters, through a system that operates continuously— 24 hours a day, 7 days a week, 365 days a year (24/7/365).

Another major effort has been put into the implementation of the Territorial Deployment Units (UDT), to provide technical support and guidance to the Regional Offices of ONEMI on comprehensive risk management. On the logistics side, four regional warehouses containing emergency supplies have been installed around the country, for the purpose of decentralizing relief and response activities, and providing prompt, effective services to the affected population.

Another particularly important development is the implementation of the Program for Community-Based Participation in Local Safety Management in Response to Natural and Anthropogenic Risk, in 31 communities prioritized according to their vulnerability index, which is the ratio between loss or damage and poverty. This educational program also includes Chile's indigenous peoples (Aymara and Mapuche) to build greater knowledge of prevention in these communities, especially regarding the particular risks they face, while respecting their cultural heritage. This year, the program has also put particular emphasis on two new vulnerable population groups: the elderly and preschoolers. ONEMI has signed a joint working agreement with the National Board of Kindergartens (JUNJI) and the INTEGRA Foundation, in charge of early childhood education, for working with the second of these new sectors.

### The upcoming bicentennial

The upcoming 200th anniversary of the founding of the Chilean Republic (2010) converges symbolically with the express concern of Chilean president, Michelle Bachelet, to institutionalize civil protection as a priority

measure in the national development process. In this context, the Bicentennial initiatives that support this progressive, committed and advanced perspective can be seen in many areas, ranging from integrated, participatory multisectoral prevention management to the process for developing a national seismological and volcano monitoring network.

### ONEMI is coordinating earthquake and volcano monitoring

In late January 2009, president Bachelet signed a decree establishing the Continuous Coordination System for Earthquake and Volcano Monitoring, an innovative initiative for the development and modernization of monitoring processes to improve prevention.

This initiative —one of the president's bicentennial projects, to be coordinated by the National Emergency Office (ONEMI)— will make it possible for this system to have an annual operating budget funded through the Public Sector Budgeting Law. A Technical and Scientific Support Committee will also be created for ONEMI, made up of a number of specialized agencies and institutions from the academic and scientific communities that will provide guidance to the system. This System is comprised of the National Seismic Prevention Program and the National Volcano Monitoring Network Program.

Several actions are planned as part of the full implementation of the National Seismic Prevention Program. One of these will be the creation of Chile's first Seismic Hazard Map, using leading-edge technology, new methods and data on Chile's seismic and tectonic history. This map will provide the country with basic information, which will be available for conducting specific studies on seismic hazards and risks. Another of the main actions will be the implementation of an Outreach and Education Program on Earthquake Prevention and Disasters of Natural Origin targeted to engineers and other experts at decision-making levels in public policy implementation.

Furthermore, the National Volcano Monitoring Network Program will include all activities for developing better scientific knowledge and conducting instrumental monitoring of Chile's active volcanoes, as tools for mitigating the potential impact of volcanic eruptions. The program also has the goal of developing a coherent system of interrelated information activities



and services aimed at facilitating decision-making and assisting in emergency management.

In referring to this initiative, President Bachelet said that “we have been favored with a land that is generous, rich and fertile, but at the same time capable of darkening the horizon with the uncontrollable forces of nature. This means that the country has had to coexist with the fury of the elements—as some would put it—and has had to learn how to get back on its feet after a disaster.”

Along these lines, President Bachelet summed up that “in the face of unpredictable misfortune, we have

to organize ourselves better, develop scientific and technological knowledge, specify the responsibilities of our government, take advantage of international experience regarding this issue and, above all, reinforce something that is always a key element to any situation: a culture of solidarity for always facing emergencies together.”

*For more information:*

*Alfredo Lagos*

*Coordination and Dissemination Department*

*ONEMI*

*vhidalgo@onemi.gou.cl*

Photo: Vitor San Marti / Wikipedia Commons



# Local governments and their contributions to the Hyogo Framework for Action:

## Lessons learned from the Telica River Commonwealth, Nicaragua

*“The most important thing here is that we have achieved without money something that might have taken longer with money. Because of this, we are not thinking about how we are going to spend the money, but rather how we get results with the few resources we obtain from municipal taxes” Ansia Alvarez, coordinator of the Project for Strategic Planning with a Focus on Disaster Risk Reduction in Telica.*



Photo: A. Alvarez

**W**e all know that “small-scale disasters”, with their accumulative effects at the local level, cause more damage than large-scale events. This is why local governments must learn to manage such disasters. In this context, three municipalities in the Telica River Commonwealth, in northwestern Nicaragua, have

developed some good practices.

This multi-hazard region, with a surface area of 1,374 km<sup>2</sup> and a population of between 60,000 and 70,000 people, includes three rural municipalities (Telica, Quezalagua and Larreynaga-Malpaisillo). The hazards relate to its geographical location—its proximity to the Maribios volcanic range, hurricane routes and



geological fault lines that can cause seismic events. In addition to these natural risks, environmental hazards are posed by mining and single-crop farming, mainly sugarcane, rice and peanuts, practiced by large-scale landowners. Combined with a high poverty rate (68 percent of the population), these hazards represent a high-risk situation that can lead to disasters. The last major disaster that affected this area was Hurricane Mitch in 1998.

Recognizing the common hazards they face in the Telica micro-watershed as well as their own capacity to cope with them, these three municipalities joined forces to establish what is now called the Telica Commonwealth. The Project for Strategic Planning with a Focus on Disaster Risk Reduction in Telica was established in the context of a DELNET training course on "Disaster Risk Reduction in the Framework of Sustainable Development," facilitated by the International Labor Organization (ILO), with UNISDR support. The three agencies involved (ILO/DELNET, the UNISDR and UNOSAT) provided non-monetary incentives such as computer equipment, training, and participation in international conferences, to facilitate the planning process.

A positive factor was that the planning process did not have to start from scratch. International cooperation projects had been implemented previously in all three municipalities to strengthen the capacity of municipal and community-based organizations and provide equipment and early warning systems for a rapid and effective response to extreme natural events such as volcanic eruptions and floods, or to prevent a disaster. Now that the foundations of preparedness have been laid, the current approach focuses on reducing underlying risks and strengthening sustainable development.

What progress has been made to date in strategic planning with a focus on disaster risk reduction?

First, the common planning project, which had been approved by the previous administration and is being implemented by the current government, was saved. The mayors that took office in late 2008 pledged to proceed with these projects in a collaborative manner. The political will is there and, at the technical level, several activities are underway so that in a few months, a municipal development plan will be in place

that includes risk reduction components and reflects the needs of all communities in these municipalities. To this end, the technical staff is holding region-wide participatory assessment workshops. The Commonwealth project coordinator meets once a week with the technical staff and holds joint working sessions to ensure mutual support among the three municipalities. One of the strengths that has helped maintain the emphasis on risk management is that a technical expert works in a municipal risk management office in each municipality. It has thus been possible to build on the work done by previous projects, consolidate community-based organizations and ensure the functioning of radiophonic early warning systems.

The establishment of an emergency fund in municipal budgets is yet another example of local governments' commitment to strengthening rapid response to emergencies and financing small-scale mitigation measures. For instance, Telica allocated C\$ 400,000 (approximately US\$ 20,430) to this category for 2009. This represents 6.86 per cent of municipal funds and 1.16 percent of the total budget for 2009. The fund allows municipalities to take immediate measures without having to wait for cash transfers from the national government. The fund was used for the first time for prevention activities to halt the spread of the H1N1 influenza virus. To date, there has not been a single case in Telica.

Enormous efforts have been made to increase knowledge about risk. This includes mapping hazardous areas in all communities, marking evacuation routes and local safety areas, which, in most cases, are the schools. The challenge now is to validate all of this information, complement it with other sources and create a database to make it available for planning processes for each territory. Activities are also underway with the National Engineering University of Nicaragua to equip technical staff with a tool to address risk factors in the design of public works.

In addition to effective preparedness, education in disaster risk reduction, and the integration of risk management into municipal planning and works, governments must seek transparency in governance and include the public in decision-making processes. As the mayor of Telica explained:



*“We mayors do not want to be the protagonists of development. We want the public to become actors so that what is done addresses their reality.”*

A change in mindset is being observed among those who have understood that they cannot be mere bureaucrats, but rather effective managers of their territories. As a result of the work done by the project coordinator and the advisor appointed by the Commonwealth, the mayors have begun to grasp that a strategic plan is an appropriate tool for territorial management and governance.

Finally, what has sustained the process to date is the political commitment, the determination of the project coordinator, who leads the process without any remuneration whatsoever, the work of the technical team in all three municipalities and the support of the UNISDR. One of the successful aspects of the strategic planning project is that it ultimately belongs to the local population and did not originate in an external entity that comes in, triggered by a specific situation, and then leaves. Up to now, all of the resources have come from the three municipalities involved, and this contributes to the sustainability of the internal strategic planning process, thereby reducing disaster risk and contributing to sustainable development.

Photo: A. Alvarez



## FUNDACRID and UNICEF signed a cooperation agreement to develop an online portal specializing in education and risk management

**T**he Foundation for the Coordination of Information Resources for Disaster Prevention (FUNDACRID) recently signed an agreement with UNICEF to develop an online portal that will include specialized information resources on education and risk management. The portal will allow users, in particular government officials, teachers, technical staff, and cooperation agencies dealing with risk reduction in the education sector, to access these relevant materials.

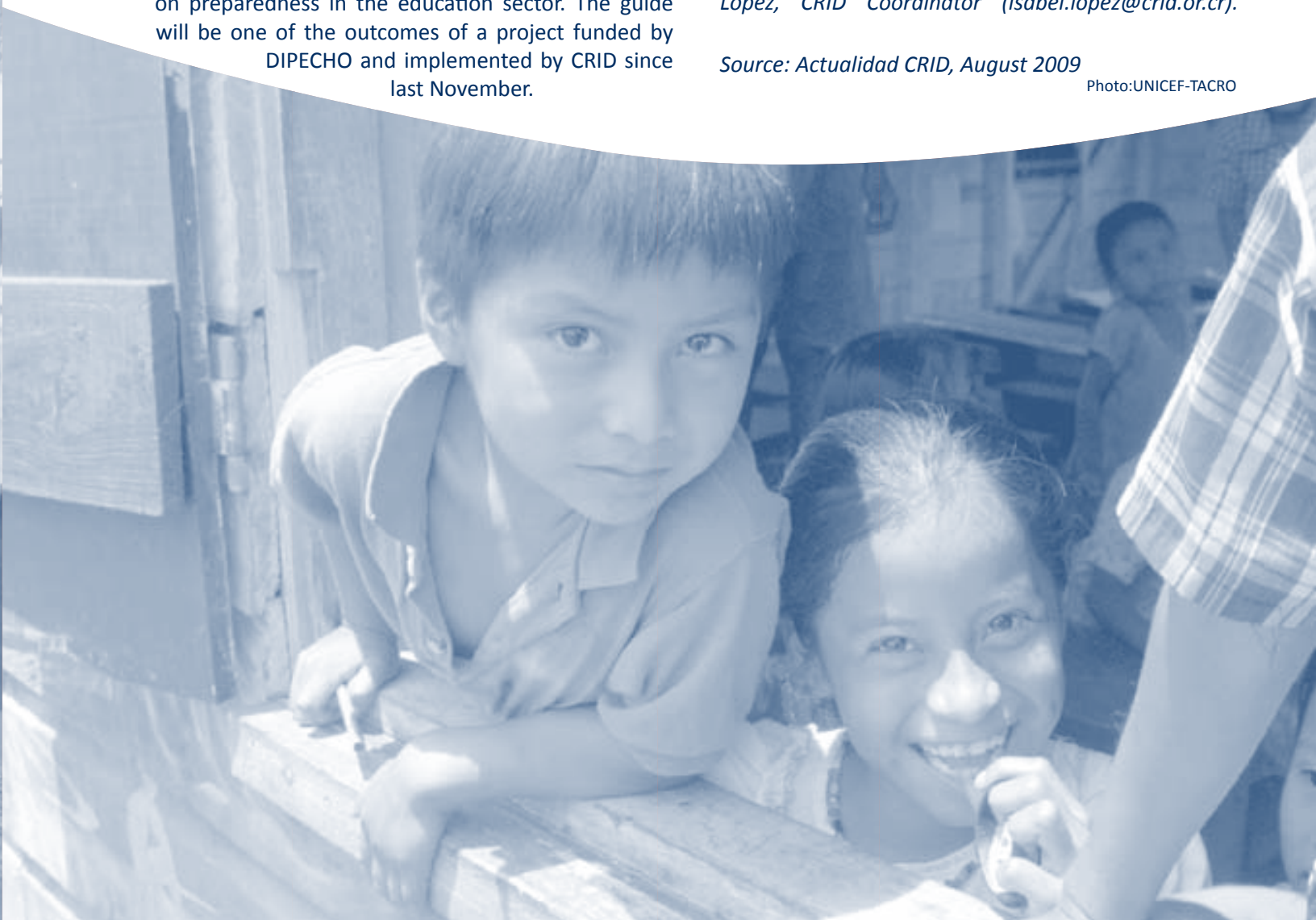
The agreement also includes the development of a practical guide with tools and information resources on preparedness in the education sector. The guide will be one of the outcomes of a project funded by DIPECHO and implemented by CRID since last November.

The cooperation agreement represents a new space for CRID to establish links with other actors that, jointly with UNICEF, take actions in the fields of education and risk management. In addition, the agreement will help CRID achieve greater thematic specialization in one of the most relevant fields, risk management, and improve its products and services intended for government officials, teachers, technical staff and cooperation agencies dealing with risk reduction in the education sector.

*For further information, please contact Isabel Lopez, CRID Coordinator ([isabel.lopez@crid.or.cr](mailto:isabel.lopez@crid.or.cr)).*

*Source: Actualidad CRID, August 2009*

*Photo: UNICEF-TACRO*



# A New Participatory Educational Model For Community-Based Training On Disaster Risk Management

Ing. Ibia Vega Cuza

ibia@cenais.cu

Dr. Fernando Guasch Hechavarría

guasch@cenais.cu

Centro Nacional de Investigaciones Sismológicas,  
CENAIIS, Cuba

## Background

Between 1998 and 2004, a number of community-based projects were implemented in Nicaragua and the eastern region of Cuba. The primary implementing agency was Médicos del Mundo—España [Doctors of the World/Spain], jointly with experts and specialists of the National Center for Seismological Research of Cuba (CENAIIS). Despite the fact that these projects had been developed within different scenarios, they were adapted to these new realities. Interventions were carried out by applying an “anticipatory approach” to disaster situations in these communities. This helped bring to light the pivotal role that communities, if properly organized, can play in controlling factors that generate more vulnerability to the hazards identified in their respective areas. In other words, actions taken were based on the contextualization of existing risks in environments where communities carry out their daily activities, going from general issues to specifics, and identifying the cause-effect correlation.

An intervention methodology was developed for all these projects, based on risk management as an effective means for reducing vulnerabilities in a timely fashion, and tackling factors conducive to these vulnerabilities in order to reduce existing risk levels in all communities involved. The starting point was the recreation of a historical scenario, which entailed assessing the impact of previous events in the region, based on the changes experienced in the current environment (dynamics of temporal scenarios), and recognizing the potential of new hazards to cause

damage, especially regarding anthropogenic activities and their impact on nature. This process was sustained by the historical memory of the population, which enabled us to identify community leaders who played the role of facilitators in the training sessions.

Under the guidance of these leaders, the population developed community structures or drew on existing ones, such as working committees and other groups, which were previously trained through workshops. These structures were responsible for disseminating knowledge among the rest of the population, so that they were able to place themselves in different scenarios, recognize existing hazards, assess vulnerability factors and distinguish areas of potential risks. Along these lines, the training plans developed were different in each community, depending on the particular scenario in which the interventions took place. For instance, in the case of El Crucero Municipality, Nicaragua, a very singular plan was developed. The plan was different from the ones previously used in other scenarios established in Cuba. Because El Crucero has an illiteracy rate greater than 40 percent, we used more participatory methods and group techniques so that the population could learn by doing. This approach helped us demonstrate that direct hands-on involvement can help these communities change their current situation.

Based on these interventions, community risk maps were developed and spearheaded by the residents themselves. The information gathered in these maps indicates their recognition that local vulnerabilities can turn into emergency situations. The principle of determining expositive risk was applied, as well the preventive calculation of potential victims. The primary outcome of the risk maps was the involvement of the community in order to foster self-sustainability and local responses. By using color-coded scales in the risk maps, communities were able to include vulnerability factors and distinguish risk areas.



It is worth mentioning the work done with young children in all municipalities through school activities that included the scenarios developed. In the case of the Cuban municipalities, the education system facilitated training activities in primary schools, community and school libraries, and the Palacios de Pioneros [pioneer school organizations], a very important space used to train children in Cuba.

### **Basis of the participatory educational model**

Experiences gleaned during the development of projects implemented, coupled with the need to efficiently translate the research results into risk scenarios to facilitate community-based training—in other words, develop educational tools to build the resilience of communities—laid the foundation for consolidating a research methodology and related training on the educational model that we have called “Aprender a convivir con el riesgo” [Learning to live with risk]. The educational model has already been validated in a number of municipalities in Cuba, through materials used as the basis for community-based preparedness and risk management. The results have been positive

thus far, and the materials have been incorporated into work structures and school curricula.

Regarding the cause-effect correlation, this model enables communities to identify themselves with their own scenarios and environments in order to recognize existing hazards, assess vulnerability factors, distinguish potential risk areas, and apply solutions aimed at improving self-sustainability. The model also allows communities to build their response capacity and reduce their level of external dependency, a form of induced vulnerability. The model addresses the contents in a logical order to learn and understand the elements that lead to disaster situations. For this reason, it is feasible to apply this model to general or contextualized scenarios, regardless of the geographical location, natural features, latent hazards, political and social conditions, or education levels of communities involved.

The educational model is composed of five modules that allow us to reflect with the communities on all the elements needed to recognize the origin of natural phenomena that constitute hazards in our physical areas, analyze the weaknesses that generate vulnerabilities, learn to assess and recognize risk and potential damage, and learn how to better prepare for emergency situations. Along these lines, the model recognizes the dialectics of nature and the dynamics introduced by human interaction with the environment. The model also recognizes the importance of education at the municipal level, especially to build the capacity needed to understand the scientific information produced by specialized bodies.

The “learning to live with risk” approach encourages communities and authorities to take an active role in disaster risk reduction, and recognizes the existence of increased, multiple hazards and vulnerabilities in Central America, especially in Nicaragua. In addition to assessing preexisting risks, the model raises awareness so that communities implement effective management strategies. Furthermore, the model allows participants to envision social vulnerability through a gender-based approach.





Photo: Carlos Cuahtémoc

### The following are the modules included in the educational approach:

- **Module 1. "Getting to know the world we live in."** This topic includes introductory elements needed to better understand natural events or phenomena, human activities and their interaction, which may generate hazards in our lives. The starting point is to recognize that Earth is a live and dynamic planet, where a number of processes and transformations occur in time and space. In turn, these cause the events that shape our lives. The module also explains the different viewpoints used to classify these phenomena.
- **Module 2. What threatens us?** Module 1 addresses how dissimilar these phenomena occur due to the geodiversity of our planet. However, aspects such as exposure and likelihood of occurrence define the limits between phenomena and hazards. It is important to learn to differentiate between both concepts, since they are not synonyms, as they are usually considered by different sectors of society.

Similar to these phenomena, hazards are generally classified based on their causes. The module puts emphasis on the main natural and anthropogenic hazards in the region or communities where interventions took

place. Their definitions, characteristics and likelihood of occurrence are also explained and documented with graphic material of the region. The purpose is to carry out contextualized training sessions, where, on occasion hazards identified are seen as part of the environment, without assessing the danger they represent. Communities are therefore guided so that they can conduct simple and preliminary assessments of existing hazards.

- **Module 3. Why do disasters occur?** It is necessary to analyze why natural and anthropogenic phenomena, or a combination of both, are considered hazards and how they can turn into complex and adverse situations for human beings and the environment, known as disasters. These require immediate responses from society or the communities affected by them.

This module includes an in-depth analysis of two of the basic categories related to disaster management and assessment: vulnerability and risk, focusing on the types of vulnerabilities and the factors that originate them, since disasters occur due to the existence of scenarios vulnerable to the hazards identified. Disasters are the manifestation of preexisting risk in our communities, and thus they are preventable, predictable and foreseeable, based on knowledge management and use. The module also defines, in a

practical and objective manner, the conditions that make our communities more vulnerable.

- **Module 4. What is risk management?** This part of the approach includes conceptual elements that are necessary to understand what risk management entails. This is done by studying risk scenarios, a method considered to be effective in reducing vulnerability levels and risk areas in our communities, and hence the potential morbidity and mortality rates associated with emergency and disaster situations. The module also details the differences between the way disaster situations have traditionally been addressed, as opposed to the current approach, which is based on risk management. Likewise, Module 4 reflects on the way disaster-related issues are addressed in countries with different political systems.

Finally, this unit focuses on the models generated through research conducted by the National Center for Seismological Research of Cuba (CENAI) on ways to avoid disasters through risk management.

- **Module 5. How can we achieve community-based preparedness?** This module addresses ways to achieve preparedness based on a community-based organization, training and planning strategy aimed at disaster prevention and mitigation. This is what ensures community self-sustainability, adaptability and resilience to complex phenomena such as climate change.

Furthermore, based on the work experience gleaned with community projects implemented by our experts in the region, the module includes a number of actions that must be taken to increase the level of community-based preparedness. One such action is the development of community risk maps, an important risk management tool. Preparedness is complemented by mitigation and prevention measures taken directly in our communities, both individually and collectively, in order to reduce the risk of different hazards in the region.

### Materials developed based on the educational model

Based on this model, we have developed and introduced in Nicaragua and Cuba two types of community-based training materials. The contents of the materials are

adapted to the particular characteristics of each country and are documented through the work experience gathered in the communities involved.

In Cuba, we developed an educational kit for community-based training on local risk management, which includes three tools and a multimedia version:

- A risk management manual for community-based preparedness.
- A series of educational papers titled "Community-based preparedness for risk management."
- A facilitator's guide.

In Nicaragua, we developed the educational manual for community-based training on disaster risk management, which is complemented with an educational video titled *Aprender a convivir con el riesgo* [Learning to live with risk].

### Bibliography

ALARN. Proyecto Apoyo Local para Análisis de los Riesgos Naturales. Instrumentos de Apoyo para el análisis y la Gestión de Riesgos Naturales en el ámbito municipal de Nicaragua. Guía para la municipalidad. Nicaragua, COSUDE. 2002.

Guasch, Fernando. Estrategia Prospectiva para la Prevención de Desastres a nivel Local en Cuba. Tesis en opción al grado de Doctor en Ciencias Técnicas. Departamento de Geociencias. ISPJAE. Havana, Cuba, 2006.

Lavell, Allan. Desastres y Desarrollo: Hacia un Entendimiento de las Formas de Construcción Social de un Desastre: El Caso del Huracán Mitch en Centroamérica. In: Garita, N. and J Nowalski, *Del Desastre al Desarrollo Sostenible: Huracán Match en Centroamérica*. BID-CIDHS, 2000.

PAHO/WHO. Hacia un Mundo más Seguro frente a los Desastres Naturales. La Trayectoria de América Latina y el Caribe. Costa Rica, Regional Office for Latin America and the Caribbean, PAHO, 1994.

SE-SINAPRED/UNDP/COSUDE. Gestión del Riesgo. Material de Apoyo para la Capacitación. Desarrollando los Contenidos. Managua, Nicaragua, SE-SINAPRED, 2004.

Vega, Ibia, Hernández, Eberto and Guasch, Fernando. Informe Final Proyecto Territorial "Fortalecimiento de la Comunidades para Enfrentar Emergencias y Desastres en la provincia Granma". Santiago de Cuba, Cuba, Fondos Centro Nacional de Investigaciones Sismológicas, CITMA, 2005.

Vega, Ibia, Guasch, Fernando, Hernández, Eberto and Telecentro Technical Team TNC TV Granmense. Kit Educativo para la Capacitación Comunitaria en Gestión Local de los Riesgos. Santiago de Cuba, Fondos Centro Nacional de Investigaciones Sismológicas, CITMA, 2006.

Vega, I; Guasch, F. (2008). Metodología para el Diagnóstico Situacional con Fines de Gestión de Riesgos de Desastres. Scientific-technical paper. Fondos del CENAI.



# Academic Offerings Directly Related to Disaster Risk Reduction at Institutions of Higher Education in Spanish-Speaking Countries of Latin America

The International Strategy for Disaster Reduction (ISDR), through the Hyogo Framework for Action 2005-2015: “Building the resilience of nations and communities to disasters” (HFA), underscores the importance of enhancing knowledge in various areas of risk management, not only of risks, but of how to implement processes of change.

There are approximately 8,910 Institutions of Higher Education (IHE), both public and private, in Latin America and the Caribbean. Approximately 6,062 of these are in Spanish-speaking countries.<sup>1</sup>

Higher education is a public good, a universal human right, and an obligation of States. These convictions are the basis for the strategic role that higher education should play in the sustainable development of all countries in the region.<sup>2</sup>

Sustainable development, however, is undermined by both natural and anthropogenic events, which threaten those societies exposed to them. Their vulnerability reproduces risk scenarios that hinder the overall goal of sustainable development.

In recent decades, a variety of large and small disasters have affected the region. Most countries have experienced hazards of one kind or another, frequently with devastating consequences at both national and local levels. Reducing vulnerability and strengthening risk management capacity are key elements of sustainable development strategies for the coming years. Global tendencies toward social and environmental degradation, as well as climate change, require effective approaches, ones with regional perspectives, but also local nuances.<sup>3</sup>

Higher learning institutions can play a critical role in assuring the viability of strategic plans for disaster risk management and sustainable development. As permanent establishments, they are the cornerstones of human resource development and programmatic applications.

As stated at the Regional Conference on Higher Education (CRES 2008), held in Cartagena de Indias, Colombia, “In a world in which knowledge, science, and technology play primary roles, the development and strengthening of higher education constitutes a key element of social progress, wealth generation, the strengthening of cultural identities, social cohesion, the struggle against poverty and hunger, climate change and the energy crisis prevention, as well as the promotion of a culture of peace.”

Today, higher education institutions have increased their participation in addressing problems related to disaster risk management through their three inherent pillars: extension, research, and teaching — this last element by establishing specific academic programs on the issue, in both graduate and undergraduate settings

In the same way, the HFA stresses the importance of making risk reduction a national priority, on a par with other goals such as the application of knowledge, innovation, and education to create a culture of safety



<sup>1</sup> Gazzola Ana Lucia Panorama de la Educación Superior en América Latina y el Caribe. CRES Meeting 2008, Cartagena de Indias, Colombia.

<sup>2</sup> Declaration of the Regional Conference on Higher Education in Latin America and the Caribbean (CRES), Cartagena de Indias, Colombia, 2008.

<sup>3</sup> La Reducción de Riesgo de Desastres, Pensamiento Global para el Desarrollo Local. Delnet/ILO. Magazine No. 3, 2006.

and resilience at all levels; guaranteeing equal access by women and marginalized groups to adequate educational and training opportunities; promoting the inclusion of gender and culture issues as integral parts of education; training in disaster risk reduction; and establishing specialized centers for regional collaboration — or reinforcing existing ones — which can conduct research, provide training and education, and foster capacity-building in the field disaster risk reduction.

## Methodology

A survey was conducted on study programs at public and private higher learning institutions (universities, colleges and technological institutes), accredited by their respective national education systems of the Spanish-speaking countries in Latin America.

The subject of inquiry was the academic offerings titled or containing the term “disaster risk management” or phrases associated with the term “disaster”, or with a particular orientation towards it.

The survey included graduate and undergraduate academic offerings. Within the undergraduate category, three sub-variables were considered: technical, technological, and professional studies. At the graduate level, the sub-categories explored were specializations, master’s degrees, and doctorates

In the development of the survey, it was necessary to bear in mind offerings leading to professional licensure [diplomado]—which, could be undergraduate or graduate depending on the location—as these are critical to teaching careers in the region.

Sources of information for this study were the institutions relevant to the project’s goals, as well as networks comprised of such bodies, via the websites of higher education institutions and professionals in the field of disaster risk working in post-secondary education

Grafico: Distribución porcentual por tipo de oferta académica en GRD ALyC a nivel de pregrado.

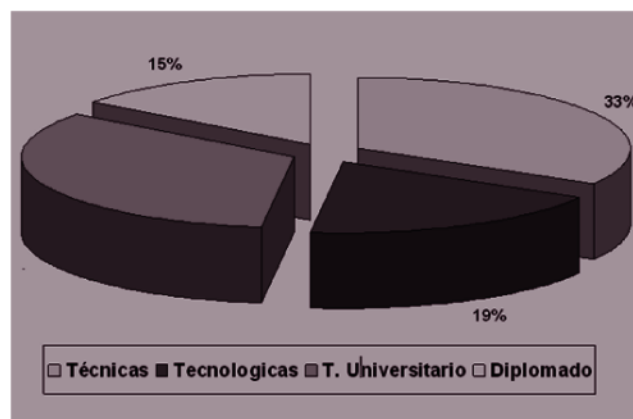
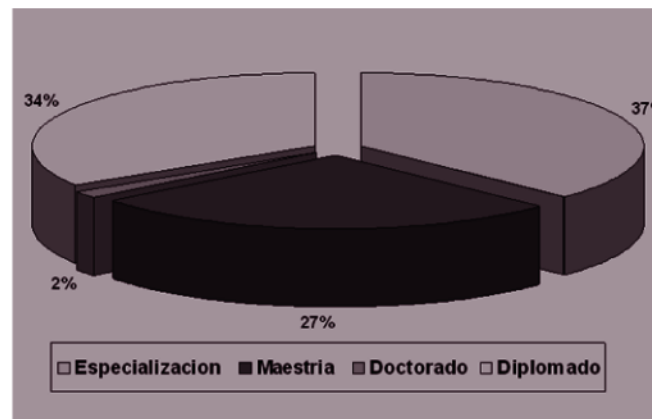


Grafico: Distribución porcentual por tipo de oferta académica en GRD – ALyC a nivel de posgrado.



## Findings

According to the findings of the survey, which was carried out in 18 Spanish-speaking countries of Latin America and the Caribbean and the territory of Puerto Rico:

- There are 76 higher education institutions in Spanish-speaking Latin America and the Caribbean that offer at least one program directly related to disaster risk management (DRM).
- These 76 institutions offer a total of 86 programs in the region.
- Only 1.24% of the institutions in the surveyed countries offer programs directly related to disaster risk management.
- Approximately 85% of the academic programs on disaster risk management are offered by universities.
- Approximately 66% of the academic offerings in disaster risk management are found in public higher learning institutions.
- Approximately 69% of the academic offerings are graduate programs.
- Among the academic offerings, degree programs (27.9%) and specializations (25.58%) are the most prevalent.
- The survey was unable to find any information disaster risk management studies programs in some countries such as Uruguay or Paraguay.
- Certain countries in Central America (Honduras, Guatemala, and El Salvador) and in the Caribbean (Cuba and the Dominican Republic), offer the fewest graduate and undergraduate programs on the subject, according to the information reviewed.
- Conversely, Colombia, Ecuador, and Peru offer the most graduate and undergraduate programs.

For further information, please contact:

Luis Carlos Martínez Medina  
UNISDR Consultant  
Coordinator of the Collaborative Goodwill Center, UNISDR  
University of Quindío  
lmartinez@eird.org  
www.eird.org / www.unisdr.org / www.preventionweb.net  
HFA-Pedia: www.eird.org/hfa.html



# INFORMATIVE BULLETIN



Photo:UNICEF-TACRO

## UNICEF's Response To The Earthquake Emergency in Peru

**O**n the night of August 15, 2007, a powerful earthquake measuring 7.9 on the Richter magnitude scale struck the Peruvian coasts, with a particular strong impact in Ica department. The damages were extensive: houses, hospitals, churches, schools and government buildings were destroyed in the city of Pisco, and buildings were severely damaged in the cities of Chincha, Ica and Cañete. The official death toll was 519 and 1,291 people were injured.

UNICEF's initial humanitarian response to the emergency in Pisco, Chicha and Ica lasted four months (August-December, 2007) and focused mainly on human lives, basic needs and the rapid recovery of people, institutions and territories. However, UNICEF continued to work through June 2009, in order to build the capacity of local and regional institutions, and contribute to their early recovery.

The chart below reflects the findings of a preliminary damage assessment in the education sector:

The earthquake completely destroyed a total of 643 classrooms.

School activities in the region were suspended mid-

year due to the damage caused by the earthquake. The damage in the education sector exceeded the emergency response capacity of the Ministry of Education. Coupled with the lack of coordination between education authorities at the local, regional, and national levels, this hampered efforts to find specific and effective solutions to the problems caused by the emergency.

Given the considerable level of damage, emergency shelters were set up for families that had lost their houses. The large number of families in these shelters sharing tents and common areas left children and women exposed to violence and sexual abuse. In addition, children affected by the earthquake experienced mental health problems with symptoms such as sadness, fear, anxiety and insomnia. For these reasons, UNICEF interventions focused on four priority areas in order to provide comprehensive services to children and teenagers:

- Early childhood development
- Children protection
- Water and sanitation
- Education



Photo:UNICEF-TACRO

In order to restore education services as soon as possible, UNICEF launched a Back to School [“Regreso a la escuela”] strategy divided into several priorities and phases geared towards improving preparedness for future disasters.

The goal of the strategy was to ensure the right to education in emergency situations through access to education in temporary classrooms, where students may continue their normal activities in a safe environment until new facilities are built. The campaign also aimed to ensure that schools were rehabilitated or repaired promptly to ensure the safety of teachers and students.

The “back to school” campaigns were no easy task. Parents, teachers, children and teenagers put up strong resistance, not only because of the physical destruction of many education centers, but also out of fear and distrust.

As a result of the destruction in these cities, children and teenagers recycled metal waste to contribute to their family income. In view of this problem, awareness activities targeting parents were intensified to encourage them to allow their children to return to school.

Activities in the fields of education, humanitarian response and emergency early recovery focused on:

- Government assistance to restore educational services and strengthen its management capacity at the central, regional and local levels.
- Ongoing technical assistance to the Regional Education Bureau and its offices in Ica, Chicha and Pisco.
- Rapid assessments of school infrastructure. Three engineers were contracted for this purpose.
- Implementation of a communications strategy to support the “back to school” campaigns.
- Ensuring access to school supplies and educational materials. School kits were provided to 12,000 students, and educational materials to 400 teachers.
- Ensuring the access of children and youth to teachers willing to respond to emergency education needs and trained in how to navigate emotional issues in the classroom.
- Support for the adaptation of curricula and related educational activities.
- Construction of 304 temporary classrooms (tents and classrooms with straw mats), which made it possible for 34,000 students to go



- back to school and finish the school year.
- Construction and restoration of bathroom facilities in 52 education centers.

The following outcomes are anticipated in the framework of the current education strategy, the post-emergency phase, and capacity-building and networking efforts:

- The education sector will be strengthened at the national and local levels in the areas of disaster risk management and prevention and preparedness for emergency situations, in order to contribute to reducing children's vulnerability.
- The Ministry of Education will have conducted a review of its emergency response plan, based on the lessons learned from the response to the 2007 earthquake.
- The educational services developed for emergency response purposes will be made a priority in the region.
- Disaster risk reduction will have been incorporated into school curricula, with materials available for teachers, students and parents.
- Disaster risk management and contingency plans will have been designed and implemented in schools located in priority areas.

Several lessons were gleaned from the 2007 earthquake in Ica. Interventions must be directed towards comprehensive services for children and teenagers affected by emergency situations. Also, comprehensive services must be made available to children under three years of age and efforts must be made to prevent violence against children. Interventions must also ensure access to safe water and basic sanitation services, and offer social and emotional support to those emotionally traumatized by the human and material losses they have experienced.

The emergency also gave us the opportunity to observe the altruism, solidarity and courage of the affected populations and of those who collaborated in the crisis. This is irrefutable proof that every crisis is also an opportunity to learn and reinforce lessons with a view towards the general well-being and integral development of the population. To capitalize on these opportunities and extract their lessons, it is important to act using the best tools available for reconstruction efforts and the psycho-affective recovery of all individuals.

*Contact:*  
*José Vásquez*  
*Emergency Coordinator, UNICEF/Peru*  
*jevasquez57@yahoo.es*

Photo:UNICEF-TACRO





# A regional workshop in Lima establishes ten priorities for disaster risk reduction in the education sector



Photo: UNICEF/Luis Vera

In the context of the world campaign titled “Prevention Starts at School,” and with the goal of establishing regional partnerships around joint efforts that strengthen the capacity of the education sector regarding disaster risk reduction and related crises, a regional workshop was held in Lima on September 9-11, 2008. The name of the regional gathering was “Building Alliances to Strengthen the Capacity of the Education Sector.”

The meeting gathered 41 representatives from 11 international cooperation agencies: Save the Children, UNICEF, International Rescue Committee (IRC), UNISDR, OFDA/USAID, PREDECAN/ CAN, OAS, IFRD, UNESCO, Plan International, Practical Solutions-ITDG, and the Andean Community. In addition to members of a number of national institutions, participants also included representatives of the Ministries of Education and national civil protection systems, such as CONRED Guatemala, the National Emergency Commission of Costa Rica, the National Civil Defense Institute of Peru (INDECI), the Ministries of Education of Ecuador, El Salvador, Honduras and Peru, and the Risk Management Secretariat of Ecuador.

The breadth and scope of experience these institutions were able to bring in their corresponding fields provided a unique opportunity to validate and coordinate efforts at the regional level on issues related to education and risk management.

The Lima workshop also aimed at fostering international cooperation by advancing the creation of a strategic alliance with agencies working in this field, DIPECHO partners and national authorities. The alliance had two main goals in mind: to guarantee the right to education in emergency situations, and to build a culture of prevention by implementing a number of concrete actions for disaster preparedness, reduction and response.

Participants worked on the development of four thematic issues: 1) challenges posed for institutionalizing risk management within the education sector; 2) school infrastructure; 3) contributions of the education sector to build a culture of prevention, and 4) preparedness and response for vulnerability reduction within this sector.

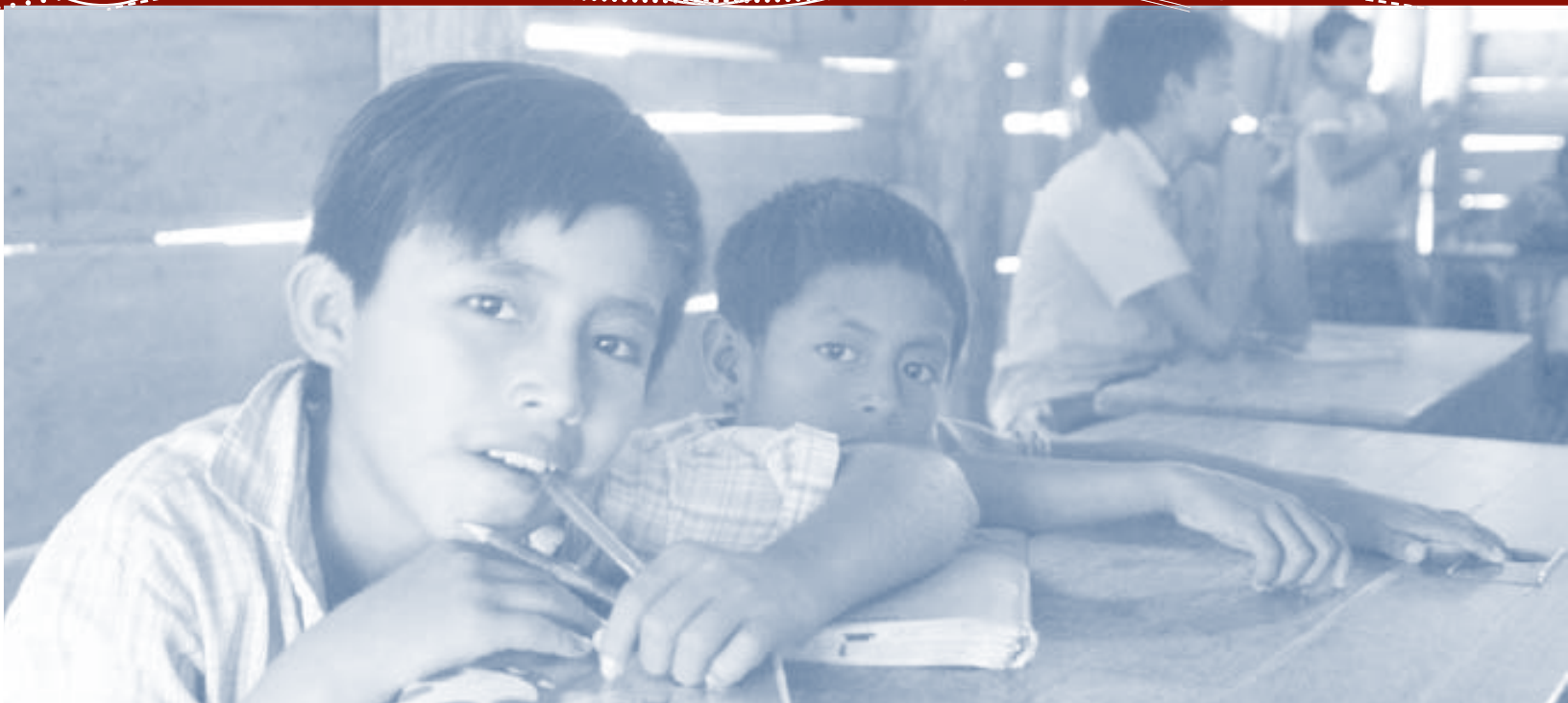


Photo: UNICEF-TACRO

Drawing on these issues, and as the main outcome of the workshop, ten priority actions were established:

1- Promote the development of indicators of regional minimum standards for temporary classrooms, psychosocial services and infrastructure.

2- Promote that curricular proposals on disaster risk reduction from the Ministries of Education are accompanied by training processes for higher education teaching staff.

3- Assess the standards and regulations that include the role of the education sector and identify critical aspects that limit their implementation.

4- Promote that schools be used as temporary shelter only as a last resort and, whenever this is inevitable, include this possibility in schools plans.

5- Insist that continuous education programs implemented by the Ministries of Education include disaster risk reduction.

6- Map institutions that train teachers, and incorporate disaster risk management as a cross-cutting or specific issue. Identify regulatory institutions and learn about what they are doing in this field.

7- Foster the development and/or the strengthening of approaches and tools for the evaluation and inventories of schools based on the different hazards.

8- Develop a proposal that includes the basic skills for disaster risk reduction that every teacher must acquire through regular training.

9- Document national experiences of sectorial education boards in Latin America and the Caribbean. Promote and support the creation and/or the strengthening of sectorial education boards.

10- Map national models of school plans that already exist in the region.

In line with the goals established at the Lima regional workshop, the actors involved in emergency education who had the opportunity to participate in the first session of the Regional Platform for Disaster Risk Reduction in the Americas —held on March 17-19, 2009 in Panama City— were able to consolidate strategic ties based on the work done by the DIPECHO project, whose efforts were made under the guidelines of ECHO and the coordination of UNICEF-TACRO.

In the context of the Regional Platform for Disaster Risk Reduction, a thematic session on education was held. During the session, the members of the Alliance for Disaster Risk Reduction in the Education Sector, jointly with other civil society actors who also participated, highlighted the need to work at three different levels: regional, sub-regional and national. In addition, priority actions were established, as well as the expected outcomes for 2011-2015, and the key actors and agencies involved.

Level of implementation	Critical factors	Priority actions	Expected results 2011/20115	Key actors and agencies
Regional	<ul style="list-style-type: none"> <li>- Promote the inclusion of disaster management in the education sector, particularly taking into account people with disabilities.</li> <li>- Promote coordination of support and technical cooperation with the Ministries of Education.</li> </ul>	<ul style="list-style-type: none"> <li>- Promote that curricular proposals on disaster risk reduction from the Ministries of Educations are accompanied by training processes for higher education teaching staff.</li> <li>- Conduct policy assessments related to risk management, especially those in which roles for the education sector are defined, and identify hindrances for their implementation.</li> <li>- Promote the development of methodologies and tools for the safety of school infrastructure.</li> </ul>	<p>R1. Systematization of experiences related to teachers' training concluded. Proposals related to teachers' training, based on school curricula in specific countries submitted.</p> <p>R2. A document that summarizes the policy assessment related to risk management that includes a number of recommendations for actions to be taken by the countries developed.</p> <p>R3. A harmonized system established. Analysis conducted and vulnerability in education centers reduced.</p>	UNESCO, UNICEF, UNISDR, Plan International, Save the Children, Ministries of Education, ITDG, OAS
Sub-regional	<ul style="list-style-type: none"> <li>- Promote the exchange of experiences between the sub-regions in order to foster horizontal cooperation.</li> </ul>	<ul style="list-style-type: none"> <li>- Map national models of school plans that exist in the region.</li> <li>- Systematize tools and experiences related to disaster management within the education sector.</li> </ul>	<p>R1. A regional model of school plans for risk management designed.</p> <p>R2. Documents, tools and experiences systematized and available in a risk management education portal.</p>	CECC/SICA, CEPREDENAC, CAPRADE, CDERA, UNESCO, UNICEF, UNISDR, Plan International, Save the Children, Ministries of Education, ITDG, OAS



<p>National</p>	<ul style="list-style-type: none"> <li>- Establish coordination between the different thematic areas and delegations of the Ministries of Education.</li> <li>- Establish coordination and collaboration efforts between the Ministries of Education and national institutions at different levels.</li> <li>- Include disaster management in planning processes related to the development of the formal education system (primary/secondary education).</li> <li>- Allocate budgets that ensure the sustainability and continuity of actions related to risk management.</li> <li>- Recognize the role of the Ministries of Education in risk management and build their capacity in this field, avoiding duplication of efforts.</li> <li>- Define the roles of institutions and tools.</li> <li>- Integrate institutions and civil society... creativity... partnerships.</li> <li>- The Ministries of Education should take into account the philosophy and viewpoints of indigenous peoples, as well as their knowledge and actions related to risk management.</li> </ul>	<ol style="list-style-type: none"> <li>1. Have policies, strategic plans, tools and human resources in the field of risk management available to the Ministries of Education.</li> <li>2. Promote and support the creation and strengthening of sectorial education boards.</li> <li>3. Promote that schools be used as temporary shelter only as a last resort and, whenever this is inevitable, include this possibility in schools plans.</li> </ol>	<p>R1. Policies, strategic plans, tools and human resources available at the national level for the Ministries of Education.</p> <p>R2. Sectorial education boards established and coordinated by the Ministries of Education.</p> <p>R3. Evidence and information generated on the impact of the use of schools as shelters on children, in order to modify legal instruments and/or practices regarding the use of schools as temporary shelters.</p>	<p>Ministries of Education (national bureaus for curriculum updating, Infrastructure, environmental education, planning, budgeting, education community, education centers) teachers' associations, national disaster management systems, legislative branches, local governments, social organizations, Ministries of Social Development, Ministries of the Environment, the media, cooperation agencies (NGOs, UN, private institutions).</p>
-----------------	--	---	---	---

Both the regional workshop in Lima and the thematic session on education held during the first session of the Regional Platform for Disaster Risk Reduction helped consolidate a partnership between international cooperation agencies, NGOs and the Ministries of Education, aimed at implementing actions that seek to protect the right to education in emergency and disaster situations.

*For further information, please contact:*  
 Claudio Osorio  
[cosorio@unicef.org](mailto:cosorio@unicef.org)

# Sixth DIPECHO Action Plan for South America



Photo: UNICEF/Luis Vera

**W**ith the financial assistance of the European Commission Humanitarian Aid Department (ECHO), and under the slogan “Strengthening preparedness to ensure the right to education in emergencies, and building a culture of prevention in vulnerable communities in South America,” the sixth DIPECHO Action Plan for South America was put in place, covering a period from April 15, 2009 through October 2010.

The primary goal of the project is to strengthen the local capacity of the education sector for disaster reduction, through horizontal cooperation between the ministries of education, and through partnerships with institutions working with this sector, in particular partner institutions of the Sixth DIPECHO Action Plan for South America.

In different forums held in this region, representatives of the ministries of education and international cooperation agencies working on disaster risk reduction in the education sector have agreed that most ministries of education in South America already have tools for addressing risk reduction and emergency preparedness in schools. Only a few countries, however, have national plans or specific policies in place to guide the actions of the education sector towards disaster reduction.

This is why the European Commission Humanitarian Aid Department (ECHO) decided to implement the sixth DIPECHO Action Plan for South America, with participation of institutions that, with this goal in mind, have become DIPECHO’s partners.

The chart below reflects the findings of a preliminary damage assessment in the education sector:

Province	Teachers affected	Students affected	Schools affected	Furniture destroyed	Classrooms affected
Ica	3,262	74,810	562	39,937	192
Chincha	2,168	49,027	416	28,357	529
Pisco	1,257	30,234	167	17,099	316
<b>Total</b>	<b>6,687</b>	<b>154,071</b>	<b>1,145</b>	<b>85,393</b>	<b>1,037*</b>

\*The earthquake completely destroyed a total of 643 classrooms.



Photo: UNICEF/Luis Vera

UNICEF Regional Office for Latin America and the Caribbean (TACRO) will be responsible for project general coordination, in order to ensure complementarities, alignment, cooperation and exchanges with similar actions taken in Central America and the Caribbean. The project technical coordination will be carried out from UNICEF office in Peru, since this country also hosts other key institutions for risk reduction, such as the Andean Community of Nations (CAN), the Regional Delegation of the International Federation of Red Cross and Red Crescent Societies in South America (IFRC), and the regional office of the Intermediate Technology Development Group (ITDG).

The project will foster participation of all countries included in the sixth DIPECHO Action Plan (Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Paraguay, Peru, Uruguay and Venezuela) in all regional activities planned. Specifically, the project will seek to help a limited number of focal countries (no more than three) implement a number of local activities. The selection

of these focal countries will be made on the basis of the following criteria: number of DIPECHO's partners working with the education sector, the commitment showed by the ministries of education to this issue, and complementarities of this initiative with in-country actions furthered by UNICEF.

Coordination of actions between UNICEF, DIPECHO's partner institutions and the ministries of education aims at contributing to the establishment of sectoral priorities related to risk reduction, and strengthening existing cooperation links and partnerships so that policy, tools and capacities for risk reduction in the education sector are developed based on actions taken by local actors, especially those related to preparedness, in order to ensure the right to education in emergency and disaster situations.

*For further information, please contact:*  
Ruth Custode  
[rcustode@unicef.org](mailto:rcustode@unicef.org)



## Riskland At The Santo Domingo International Book Fair



Photo: UNICEF-TACRO

**D**uring the seventh International Book Fair, held in April in Santo Domingo, Dominican Republic, an exhibit booth, coordinated by Dominican Ministry of Education, was devoted to emergency education. Its primary goal was to be a space where people could learn how to prevent disasters.

The fair booth also featured the “Riskland” board game, which caught the attention of children and adults. During the fair inauguration, the Dominican Minister of Education was invited to participate in the game. After taking off his tie and jacket, the Minister stood on the giant board and played the game with several enthusiastic students.

The fair booth devoted to emergency education had some 30 students who, after being trained in related-issues and learning the rules of the “Riskland” board game, became the main promoters of this educational tool, a fun way to learn, through actions and attitudes, how to reduce and mitigate disaster impacts.

“Let’s learn to prevent disasters” is an educational kit for children aged 8-13 years that complements other

tools used in schools. Its content allows to address, in an innovative and interactive fashion, issues related to disasters and natural phenomena. The “Riskland” board game includes questions and pieces of advice that enable children to learn different concepts such as prevention, hazard and vulnerability.

The size of the board, as well as the issues addressed by the game and the way it introduces related concepts, capture people’s attention. At the book fair, the board game became a sensation. A large number of visitors were attracted by “Riskland”. It is expected that this initiative, supported by the Ministry of Education, will serve to raise awareness among children and youth about the effects of risks and how to prevent them.

The International Book Fair is an annual two-week event held at the Plaza de la Cultura (Culture Square) in Santo Domingo. Thousands of people go to the fair every year, including large groups of students.

*For further information, please contact:*

*Jorge Quintela*

*[jquintela@unicef.org](mailto:jquintela@unicef.org)*