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Early warning systems and effective risk reduction

The role of the United Nations Special Envoy for Tsunami Recovery

In promoting risk-reduction efforts, the UN has benefited from the active support of the Secretary-General's Special Envoy for Tsunami Recovery, former US President, Bill Clinton.

The following presentation on the Special Envoy's role has been prepared by Delnet in collaboration with President Clinton's Office at the UN in New York.

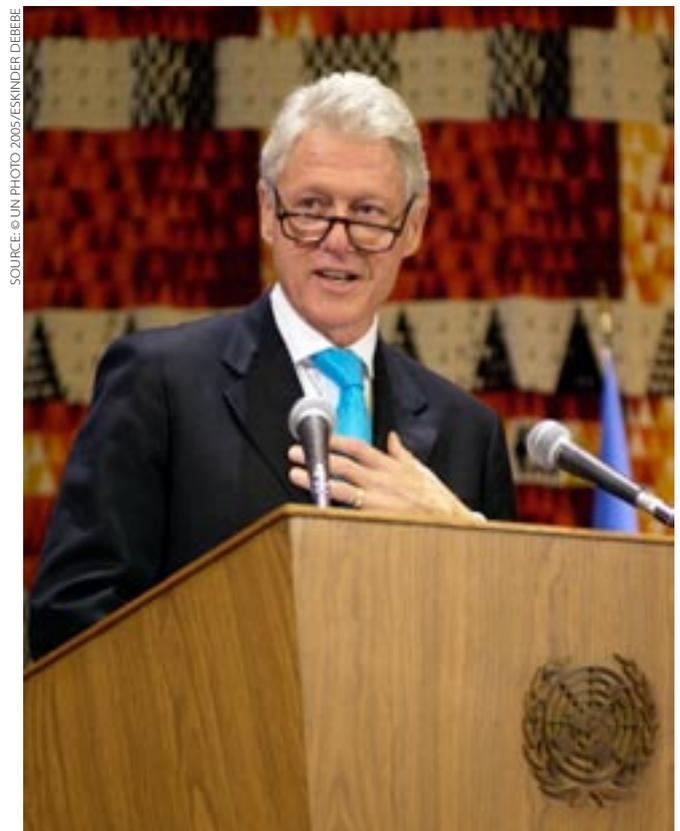
At the Third International Conference on Early Warning, held in Bonn, Germany in March of this year, former United States President Bill Clinton underscored to the assembled audience of policy makers, practitioners, students and journalists, the importance of early warning systems in saving lives and livelihoods.

President Clinton attended the Bonn meeting in his UN capacity - as the UN Secretary General's "Special Envoy for Tsunami Recovery". His appointment, announced in February 2005, followed a resolution of the United Nations General Assembly on the Indian Ocean tsunami which included the recommendation that the Secretary-General appoint a Special Envoy to help sustain global political will in the recovery effort.

Since being appointed, the Special Envoy has played an active role in both the tsunami recovery process and in promoting risk-reduction policies more generally. Supported by a small office at United Nations headquarters, President Clinton has worked to keep the international community committed to the massive recovery effort and to building back better.

President Clinton has described his main priorities as Special Envoy as follows:

- Keeping the world's attention on the tsunami operations in order to avoid the short-term attention-span that has characterized so many previous international efforts of this kind, as well as to ensure that promises-made do not become promises-forgotten.
- Supporting coordination efforts at the country and global levels, to ensure that all the actors, governmental and non governmental, public and private, local as well as international, retain the spirit of teamwork that characterized the operations from the first days, and that resources are used to maximum effect.
- Promoting transparency and accountability measures that will, on the one hand, ensure resources are



President William J. Clinton at the UN Economic & Social Council ECOSOC, New York, USA, July 14, 2005

used well and for the reasons intended, and, on the other, retain the engagement of the millions of donors to this operation, from the smallest households to the largest corporations for this and future crises.

- Championing a new kind of recovery, one that not only restores what existed previously, but goes beyond, seizing the moral, political, managerial and financial opportunities the crisis has offered governments to set these communities on a better and safer development path.

At the close of the first year of operations, the Special Envoy's report to the Secretary General¹ noted that "given the scale of the disaster, the recovery process (is) still in its early phase." It noted, nevertheless, some of the important achievements of the first year, including construction of transitional shelters, temporary schools and health clinics as well as groundbreaking on permanent homes and key infrastructure. According to the report, "each affected country faces different challenges, and the picture of progress is therefore an uneven one; yet common to all is the reality that it will take many years for individual households, and the wider economies on which they depend, to recover from the most destructive disaster caused by a natural hazard in recorded history."

During his second year, the Special Envoy has increased his efforts at promoting the implementation of a wider disaster reduction agenda globally, as well as supporting efforts to strengthen national and regional capacities for tsunami early warning and response in the Indian Ocean region.

In an opinion piece featured in the *International Herald Tribune* on 24 December 2005, President Clinton - elaborating on his key goals for 2006 - emphasized the need to ensure continued progress on disaster risk reduction. The UN Special Envoy noted that less than one month after the tsunami struck, 168 countries came together in Japan and agreed to the Hyogo Framework for Action, which set strategic goals, priorities and concrete steps for governments to reduce disasters over the next ten years. These included national education campaigns to ensure that populations recognized the early signs of



Tsunami destruction in Banda Aceh

impending disaster, better planning for land use to avoid investments in disaster prone areas, as well as agreement on standards for disaster-resistant construction and restoration of environmental mitigation measures. He remarked that "these changes will require policy and resource commitments that have yet to be made," calling for these efforts to "move more quickly."

Following that opinion piece, President Clinton issued a strong statement to mark the one-year anniversary of the adoption of the Hyogo Framework, urging governments to implement the recommendations of the Framework without delay.

The "last mile" of the early warning systems

The need to develop people-centred early warning systems, which ensure that warnings "reach the beach" and people know how to react has been strongly promoted by the Secretariat of the International Strategy for Disaster Reductions (ISDR) for some time now. The issue was also highlighted in previous international early warning conferences that took place in Potsdam, in 1998 and in Bonn in 2003.

In his keynote address at this year's Bonn early warning conference, President Clinton drew on the example of Bangladesh to illustrate the effectiveness of risk reduction measures, highlighting the costly lessons that country had learned from a cyclone in 1973 that took more

¹ UN Office of the Secretary-General's Special Envoy for Tsunami Recovery, *Tsunami Recovery: Taking Stock after 12 Months*, UN, 2005.

than 300,000 lives. The Envoy described how the Government of Bangladesh and its partners had subsequently put in place effective early warning and preparedness measures involving modern cyclone-forecasting systems and more than 5,000 volunteers to get the message out to the villages. He pointed out that when a cyclone of similar force struck in 1997, 200 people were killed – still too many but a dramatic drop from the 1973 toll. “The interesting thing to me is what Bangladesh did to marry old-fashioned communication with modern technology, the so-called ‘last mile’ of the early warning system. It’s something that we dare not forget in our UN work for the tsunami and in general we dare not forget,” he added.

A UN-commissioned Global Survey of Early Warning Systems, which was prepared for the Bonn Conference in March, notes that, over the last 30 years, deaths from disasters have been declining, partially due to the role of early warning systems and associated preparedness and response systems. The report stresses, however, that to be effective, early warning systems must be people-centered and must also integrate four elements-- knowledge of the risks faced; a technical monitoring and warning service; the dissemination of meaningful warnings to those at risk and public awareness and preparedness to act. Failure in any one can mean failure of the entire early warning system, the survey warned.

Addressing these issues raised by the survey, in Bonn, the UN Special Envoy emphasized that effective early warning would take more than scientifically-advanced monitoring equipment. “All the sophisticated technology won’t matter if we don’t reach real communities and people. Satellites, buoys, data networks will make us safer, but we must invest in the training, the institution building, the awareness-raising on the ground.” Calling on participants and the wider international community to do more, he noted “[if] we want effective global early warning systems, we must work together, government to government, federal and local officials, scientists with policy makers, legislators with teachers and community leaders.”

President Clinton expressed his hope that the Bonn Conference would lead to a new global effort to put in place effective early warning systems everywhere as part of a more comprehensive disaster reduction effort. Referring to the UN survey, he noted that it revealed that there



President William J. Clinton at the EWC III

were still big gaps in the early warning systems: “[In] an all-familiar pattern, developing countries, disproportionately affected by disasters, still often have ineffective or non-existent early warning systems,” he noted.

Strengthening the Indian Ocean Tsunami Early Warning System (IOTEWS)

During a roundtable on the Indian Ocean early warning system at the Bonn Conference, President Clinton endorsed an inter-agency initiative to support Indian Ocean governments to develop and strengthen their national plans for tsunami early warning and response. Each of the seven consortium members have committed to helping governments develop detailed plans for particular aspects of their national tsunami early warning and response system.

Target areas include tsunami warning centers and communication systems, disaster management, evacuation planning, public education, and environmental risk management. Several countries have already expressed interest in the offer. Partners include the Intergovernmental Oceanographic Commission of the UN Educational and Scientific Organization (UNESCO), the

World Meteorological Organization, the UN Office for the Coordination of Humanitarian Affairs, the UN Environment Programme, the International Federation of Red Cross and Red Crescent Societies, the UN Development Programme and the World Bank. The ISDR secretariat coordinates and facilitates this multi agency initiative.

This initiative was further discussed at a recent regional ISDR workshop in Bangkok focusing on the IOTEWS, and progress made by countries will be reported to the upcoming Intergovernmental Coordination Group meeting in Bali (31 July- 2 August).

Future challenges

At the Bonn Conference, the UN Special Envoy also cautioned that, while preventing future disasters was very important, hundreds of thousands of people are still struggling to recover from past disasters – such as the tsunami, the Pakistani earthquake, and the Gulf Coast hurricanes. He stressed that those people must continue to be a priority. “In the tsunami-affected region, we are working hard to help the survivors get back on their feet. Economic and social infrastructure was wiped out across the region. Homes and families, schools and teachers, health clinics were devastated. Recovery is going to take years, but we are making progress.”

And what exactly is that progress? Today, nearly 100,000 new homes have been built or are being constructed throughout the tsunami-affected region. Many more are in the pipeline. Over 600 permanent schools are under construction while temporary facilities have enabled children to go back to school more quickly than many imagined. Tourist numbers are on the increase in Thailand and the Maldives, while In Sri Lanka, over 70% of households have reportedly regained a regular source of income.

The UN Special Envoy continues to advocate for a reconstruction of the tsunami-hit region that is coupled with progress on risk reduction. In Bonn, he reported on the significant progress made in creating an Indian Ocean tsunami early warning system with an interim system up and running by April 2005. A total of 29 countries engaged in the Indian Ocean process have quickly



Third International Conference on Early Warning, Bonn, Germany, March 27, 2006

set up a regional network and have started to up-grade their telecommunication infrastructure. The initial Indian Ocean system will be inaugurated by July of this year, with real-time data coming from new seismic tide gauge stations and buoys.

Nevertheless, much more needs to be done. The biggest challenge of an end-to-end warning system is in ensuring the “last engineering mile,” so that warnings not only reach communities on the coastline, but that these communities also know how to react.

A common lesson learned in the past few years is that disasters can strike anywhere and at any time. Hurricane Katrina tragically illustrated this as it devastated an area the size of the United Kingdom, killing more 1,300 people, displacing hundreds of thousands and leaving close to half a million jobless. And the current hurricane season, which has just begun, will no doubt threaten the lives and livelihoods of many for the next six months throughout the Americas.

At Bonn, President Clinton remarked that “[we] have all learned a lot from the things that have happened.” He added, however, that “the question is whether we will put what we know into action. In the end, disaster reduction is about making the right development choices: where to locate a school, how to protect buildings better, how to build them better, how to pursue sustainable development. It's about investing in practical and effective people-centered early warning systems. And it's about addressing the long-term challenges that will give us more natural disasters, particularly climate change...” ■

United Cities and Local Governments



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Cités et Gouvernements Locaux Unis
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Tsunami 2004 – Response to the disaster and commitment to reconstruction

Based on the UCLG Tsunami Action Report 2006

More information available at: <http://www.cities-localgovernments.org>

On 26 December 2004, an earthquake struck the Island of Sumatra, Indonesia, followed by a tsunami, which struck the coasts of numerous countries in Southern and Southeast Asia and on the Eastern coast of Africa, causing an unprecedented disaster. The toll was some 300,000 dead. After this dramatic event, the international community and local governments throughout the world mobilized to provide aid to the victims.

The impact of the tsunami on local government

In the Province of Aceh in Indonesia, 14 out of the 21 local governments were paralyzed or had their operation severely impeded. In the Province of North Sumatra, 3 local governments out of 23 have difficulties. Out of approximately 76,000 local government staff in the Province of Aceh, nearly 3,000 were killed and over 2,000 are missing.

In Banda Aceh, a city of 240,000 inhabitants that was 50% destroyed, the Mayor was killed as well as two municipal councilors. 20% of municipal employees and a quarter of teaching staff also died. 60% of facilities and infrastructure were wiped out. Twenty municipal councilors lost their homes, and numerous municipal buildings were destroyed, as well as the town hall.

In Sri Lanka, many districts were affected by the catastrophe: 75 local governments, of which nine were municipalities, were paralyzed due to human and material losses. The following infrastructure, which is within the competence of these local governments, needs to be reconstructed: 14 health care centres, 72 nursery

schools and day nurseries, 166 bridges, 1,238 km of roads, 27 marketplaces, 75 public buildings, 118 wells and 97 vehicles, machines and various equipment.

The response to the disaster: UCLG as a focal point for information exchange

The local government response to the disaster took different forms: emergency, financial aid, supply of personnel and materials, appeals to citizens to make donations and organization of events to aid the victims.

The UCLG World Secretariat was asked to become the **focal point for information exchange on the actions of the world's local governments in the affected areas**, and to ensure coordination with the United Nations and its agencies.

According to the information that the UCLG World Secretariat gathered on the actions undertaken by its members (in January 2006), one hundred cities and local governments from 25 countries together mobilized over 14 million Euros.

The commitment of UCLG in the reconstruction phase

The reconstruction phase has already begun and local governments are playing an important role, different to that of International Organizations and NGOs. **Local government actions are based on partnership with the local authorities in the affected areas.**

The diversity of responses to the emergency

Out of a selection of some one hundred cities and local governments in 25 countries (5 in Asia and the Pacific, 2 in the Middle East, 15 in Europe, 1 in North America and 1 in Africa), the reactions in the emergency phase were as follows:

- 62 agreed to provide emergency financial aid to the different NGOs present in the countries.
- 36 appealed to their inhabitants to make donations. Collection boxes were installed in city halls and information was posted on websites for those who wished to make donations by bank transfer, with special accounts being opened to this effect.
- 9 sent materials, including medical materials, water purifiers, drinking water and pumps to clear the sanitation systems.
- 6 sent personnel, namely medical teams, rescue teams with dogs and technical teams.
- 5 organized events, such as concerts or art festivals to raise money for NGOs.

They use their experience in local management, whether in restoring essential services or local governance, development of local democracy or citizen participation. Thus, local government cooperation aims to strengthen local authorities and provide them the means with which to participate in the coordination of the reconstruction process, ensuring that it can be carried out in keeping with the needs of the local population. This is the case with many action plans developed in the most affected provinces and districts, thanks to the support of UCLG member cities and local governments associations and under the coordination of the Secretariat of the organization. To date, some projects have been implemented and nearly completed, while many others are still in progress.

UCLG is calling on cities and local government associations across the globe to support the international aid efforts in Asia and East Africa.

- Click here to see [local government initiatives](#) on the tsunami.
- If your city or local government association is undertaking activities to help the international aid effort, please send details to the [UCLG World Secretariat](#).

Several UCLG missions to Indonesia have taken place to meet with Indonesian local authorities to agree actions for the reconstruction phase. Two initiatives have been developed with the Municipality of Banda Aceh¹, one of the cities most affected by the tsunami:

- A project to develop the communication capacity of the Municipality of Banda Aceh, in partnership with the Digital Solidarity Fund, that facilitated the creation of an information system for the management of municipal equipment;
- A waste management project with many components: support to a water strategy, providing collection equipment, and installation of a treatment system. This project, submitted to UCLG by the Mayor and the Head of Sanitation and Park Department of the Banda Aceh Municipality, is in the process of being developed with the support of cities from the region of Catalonia, including Barcelona, Cités Unies France and the City of Apeldoorn in the Netherlands.

Moreover, UCLG Secretariat is developing a **database of local government experts** to enhance the resources of the United Nations, through the UN Office of Coordination of Humanitarian Affairs (OCHA). Through this facility, UCLG is strengthening its partnership with the UN and supporting local government initiatives to help cities faced with disaster situations.

We invite all [@local.glob](#) readers to follow the development of this and other initiatives of decentralized cooperation in partnerships with the local authorities of the affected areas, through the UCLG Web Site: <http://www.cities-localgovernments.org>.

The UCLG and the Delnet Programme have set up a shared virtual space to facilitate access to information, networking, cooperation and exchange of experience between local governments and socioeconomic actors throughout the world. The activities and initiatives of this important organization will be voiced and publicised in this space, available on <http://www.delnetitcilo.net/uclg> and also in this journal.

¹ The city of Banda Aceh is situated at the northern point of Sumatra and covers an area of about 61 km² divided into 9 sub-districts, 89 villages with about 213,000 inhabitants.

Local level risk management

Concepts and experience in Central America

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Abstract of a paper prepared for the Disaster Preparedness and Mitigation Summit, 21-23 November, 2002, New Delhi, India

Full version available at: <http://www.desenredando.org>

Introduction

Magnum disasters, those that affect large territories and have important impacts on infrastructure, population and production, may be seen in various different dimensions. On the one hand, they are crisis situations that elicit the response of national and even international disaster response organizations and are likely to be given the denomination of “national” or “regional” scale disasters. On the other hand, a large scale disaster can also be looked at as a myriad of small scale, local, community or family level disasters all related to the same physical detonating agent. This may be an earthquake, hurricane, flooding, volcanic eruption, tsunami or one of many other possible disaster hazard agents. The nature of the damage and destruction and its social and territorial distribution may take the physical event as a point of reference, but in the final equation damage and loss is determined by the differential levels of exposure and vulnerability of the population, infrastructure and production. This varies enormously between different spatial and social units and, in consequence, levels of damage and difficulties in recovery will be commensurately differentiated. Even within a single spatial or social unit differential levels of damage will be found that reflect this heterogeneous structuring of social vulnerability (Hewitt, 1997; Lavell, 2000; Wisner et al, 2003).

Large scale disasters, those that tend to receive a good part of the attention and to be registered in international disaster statistics, are, however, but one component of

the disaster problematic. Alongside these events, a multitude of small and medium scale disasters occur that are restricted in social and spatial terms to small zones, localities and communities. These events tend to be recurrent, have to be dealt with by local authorities or families, are related to a wide range of hazard types and accumulatively account for very significant losses which according to some may be proximate to the losses associated with large scale disasters.¹

Whether we are dealing with large or small scale disaster events, both have a common characteristic. Their occurrence is related to the prior existence of risk, a condition that implies the interaction in time and space of what are known as hazards and vulnerabilities. These generate conditions that presage and announce future disaster. That is to say, risk is a latent condition, whilst disaster represents the actualization of existing risk conditions where the physical event serves as a detonator of disaster, but not its final cause. Risk is generated by a series of complex social processes that are instigated by different social actors and at different spatial scales. But, risk is always expressed in concrete terms, and can be measured most adequately, at the micro social and territorial scales. And, the playing out of risk when transformed into disaster always has a concrete and differential expression at the local level.

It is now well accepted that disaster preparedness and response requires the active participation of the local population. Centralized response structures are inad-

¹ See the “DESINVENTAR Database” developed by LA RED in Latin America. LA RED is a Network of specialists in Disaster Risk Management, created in 1992 in Port Lemon, Costa Rica. More information: <http://www.desenredando.org>.

equate and can not respond effectively to disaster when expressed at the same time in multiple different areas and places. The first to respond to disaster and instrument early warning measures are local populations and authorities. Over the last ten to fifteen years more and more attention has been given to the stimulation and strengthening of local disaster preparedness and response capacities, although much has still to be done in these areas.

With the increase in saliency of primary risk reduction and risk management concerns over the last ten years in particular, a good deal of attention has been given to local risk management principles and activities. This has taken up on lessons learned and practices implemented at the community levels during the 1980s and early 1990s (Maskrey, 1989). More recent experiences, however, have broadened the conceptual base and action framework for local level initiatives in favor of more development oriented and holistic approaches. The basis of this type of intervention can be found in the recognition that risk is expressed locally and although the processes by which it is constructed are not restricted to this level, the most adequate entrance to the problem and its resolution is with the active participation, collaboration and leadership of local actors. In the Latin American context, and elsewhere, there is also a growing conviction that local level risk management can not be divorced from the local level development challenge and matrix, and that risk and development management must go hand in hand. Disaster risk reduction will be most effective when it is considered in the light of daily life risk factors such as unemployment, ill health, malnutrition, lack of basic hygiene and social and family violence. These conditions typify or define underdevelopment, social exclusion and poverty. Hazard reduction, vulnerability reduction and increases in social resilience must go hand in hand in order to construct more disaster resistant communities and localities (Lavell et al, 2005).

The increase in local risk reduction and management concerns in Central America and changing approaches

Prior to the 1998 impact of Hurricane Mitch in Central America, local level risk management had been promoted on a very limited scale. Initiatives with community

or local level preparedness, early warning systems and risk reduction had been promoted by such organizations as the International Red Cross, GTZ Germany, and The Latin American Network for the Social Study of Disaster Prevention-LA RED, but this was not a generalized fact. Some initiatives had also been taken by the national disaster organizations in the framework of recommendations emanating from the International Decade for National Disaster Reduction, whilst a limited number of community-based organizations had also taken up on the problem in disaster prone areas.

Hurricane Mitch and the earthquakes in El Salvador in 2001 stimulated a rapid increase in the saliency of local level risk reduction management and measures. This was not only promoted by the evidence thrown up with the events themselves but also by policy dictates emanating from Central American government resolutions in the framework of the Central American Integration System, and follow up to these by the Central American Coordinating Centre for Natural Disaster Prevention-CEPREDENAC.

Following Mitch, relatively large scale investment has been made in local risk management concerns, financed by a large number of international organizations and institutions. These include OFDA-AID, DIPECHO of the European Union, the Swiss Cooperation (SDC), UNDP and UNICEF, the World Bank and Inter American Development Banks. Schemes have been implemented by a wide variety of international and national NGOs, including CARE, CHF, Action Aid, Oxfam, CARITAS, Plan International, the Humboldt Centre in Nicaragua and the Centre for Disaster Prevention in El Salvador. Moreover, government based institutions promoting municipal development and decentralization have taken up on the challenge and developed local level risk reduction programmes or concerns.

A 2002 rapid inventory exercise promoted by a UNDP-CEPREDENAC project in the region (see, Lavell, A. et. al. 2005), identified over 150 local level initiatives in the seven Central American countries all promoted since 1998. These cover a large array of topics and approaches, where different aspects of local level risk reduction come into play. Undoubtedly, a more thorough inventory process would reveal a considerable number of additional efforts by smaller NGOs and community based groups.

One interesting and relevant aspect that can be discovered as regards the new spate of interest in local risk management concerns relates to the way an important number of the initiatives are promoted by development NGOs involved with the promotion of local development, decentralization and environmental management. This diversification of schemes and approaches, which compliment initiatives developed by risk and disaster institutions, responds to the prevailing belief that risk management is best achieved when linked to development processes, when seen as a parameter of development and a cross cutting theme built into development initiatives, in the same way as many environmental and gender initiatives have been approached over the last years.

This approach recognizes that risk is constructed with the normal processes of social change and development. And, that disaster risk reduction, prevision and control is best approached when considered within the framework of the search for increased overall human security and the reduction of global risk, including daily life style risk associated with poverty. In this way, consideration is not only given to the reduction of existing risk, but also to avoiding the construction of new risk in the future, product of inadequate development processes and projects. Considered in this way, risk management then becomes a strategy for social and economic transformation and development and not simply a conservative mechanism for reducing risk where no improvements occur in the basic living conditions and economic options available to the population. Increasing resilience and going from coping to thriving then assume their due position in the overall risk reduction process.

The merging of concept and practice and the parameters and characteristics of best practice local risk management

During the last 15 years in Latin America, considerable advance has been made in the development of conceptual frameworks, first for community level disaster prevention and, during the last six years, with notions regarding local level risk management. An important contribution to this debate has been made by LA RED. On the other hand, the implementation of local level schemes and projects has allowed a considerable amount of experien-

ce and knowledge to be gained as regards good practice and successful risk reduction actions and strategies, whether subject specific or of a more general kind. The aforementioned CEPREDENAC/UNDP project in Central America also provided valuable information for the development of concepts and the design of interventions. In the present summary section we will briefly provide a definition of local level risk management and identify the major parameters or characteristics that contribute to the successful development of such practice.

Disaster risk management considered in generic terms can be seen as relatively complex social process aimed at the reduction of existing disaster risk levels and the prevision and control of future risk in society. This process signifies the implementation of a concatenated series of activities that finally lead to the implementation of risk reduction or control strategies, instruments or actions. These activities include:

- The construction of risk scenarios for delimited areas, sectors or populations, considering particular hazard and vulnerability factors, the social processes and actors behind these and the development context in which risk is manifested.
- Decisions as to acceptable and unacceptable risk levels, taking into account the social, economic, cultural and political context in which risk is manifested.
- The identification of potential risk reduction or control strategies, instruments or activities and the discussion and negotiation of feasible, optimizing solutions.
- The implementation of the selected risk reduction strategy and measures.

The notion of disaster risk management is not a terminological substitute for disaster prevention and mitigation. Rather, risk management applies to the full range of activities considered under the traditional notion of the disaster cycle or continuum. Risk reduction, prevision and control are pertinent in pre impact contexts and also with regards to preparedness, response, rehabilitation and reconstruction. Risk is present in all these stages, and is ever evolving and changing, requiring different approaches and types of intervention. Where risk management is used to reduce existing risk we may refer to corrective or compensatory risk reduction and where it is used to predict and control future risk we may refer to

prospective risk management. Prospective risk management is used in the context of development planning and project processes searching to guarantee adequate levels of security or sustainability for new investments.

The principle defining characteristics or parameters of risk management are the following:

- It is a process and not a product. That is to say, the particular instruments, actions or interventions used to reduce or control risk do not define the process itself. Rather, these are the result of an analytical and decision making process by which decisions are taken as regards adequate types of intervention.
- It should be considered in the light of development objectives and contexts and should be considered a strategy or dimension of development and project planning and not as an adjunct to this. Risk management that builds on and is integrated into the debate on development and the strategies for achieving this is likely to be far more successful than the instrumentation of one off practices or activities that search to reduce risk, but without contributing to the transformation of basic social and economic conditions in affected areas.
- Full participation of the subjects of risk is fundamental in the search for and implementation of adequate risk reduction schemes. That is to say, risk management can not be seen as a technical or technocratic pursuit, solely in the hands of professionals or technical staff. Participation of affected groups is an obligatory component of successful risk management.
- Participation is the basis for the appropriation of risk management by affected groups and such appropriation is a defining characteristic of the process and the basis for future sustainability. External professional and technical actors are clearly highly rel-

evant but must work alongside the subjects of risk in searching for adequate interventions that respond to their needs and requirements and which uses their capabilities, resources and opportunities.

The above mentioned characteristics are fundamental to the definition of local level risk management. A key parameter in this definition relates to the participation in, and **appropriation of the process by local organized and institutional actors or individuals**. Local level risk management can not be practiced by external actors. These may play an important part in establishing, fomenting or strengthening local level management and its structures, strategies, practice and instruments, but they can not in themselves be seen to practice local level risk management through the projects they bring to local areas.

Finally, it is necessary to comment that very few examples of local level risk management exist that comply fully with the characteristics and parameters described above. Rather, these serve to establish a type of utopian, best practice to be sought in the future. To date, most local level interventions or practice are externally driven and controlled and participation and appropriation have only been partially achieved. However, many examples exist where partial and thematic approaches have been implemented with encouraging results, and where several of the parameters used above for defining local level risk management best practice have been respected. This includes the establishment of early warning systems, the design of local level development plans dimensioned with risk reduction considerations, the strengthening of local risk management organizations, the promotion of ecologically sound agricultural development, risk conscious river basin planning, and the instrumentation of diverse hazard control mechanisms, including dykes, terraces, reforestation and slope stabilizing mechanisms, etc. ■

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Vulnerability of small and medium enterprises to disasters

The case of tourism in Central America

Emilio Zevallos V.

FUNDES - The business solution network in Latin America

<http://www.fundes.org>

Disasters caused by natural phenomena have become a development issue, above all in Latin America (and particularly in Central America) due to their recurrence and also due to the great impact they have on production in these countries. In Central America alone, the cost of damages caused by various types of disaster has been calculated at nearly fifteen billion dollars between 1970 and 2005 (see Table 1).

Practically the entire region has suffered at least one major disaster over the last 30 years. Central America is also one of the more vulnerable regions within Latin America due to the recurrent ravages of nature and also because the area's economic and social backwardness makes it more vulnerable and less likely to be able to deploy sufficient resources for establishing an effective

disaster prevention and awareness strategy.

The rising rate of disasters in the region is also an alarm signal that we need to take steps to minimize their human and economic impact. Hence the importance of disaster prevention. It is nevertheless unclear whether this should be exclusively the duty of the State or whether the private sector should also contribute to the development of an effective strategy.

Although the preventive aim of reducing vulnerability to such effects is important, we must also aim to generate sufficient investment to promote the development of more sustainable systems. It is therefore important to encourage more active participation by the private sector so that prevention and development may be seen as two sides of the same coin.

Table 1. Damage caused by disasters due to natural phenomena in Central American countries between 1971 and 2005 by decade (in millions of dollars - USD)

	Costa Rica	El Salvador	Guatemala	Honduras	Nicaragua	Panama	Total
1971-80	0.20	0.00	1,002.50	561.00	847.38	0.05	2,411.13
1981-90	89.50	1,310.00	100.00	101.00	756.00	60.35	2,416.85
1991-00	344.09	389.60	748.00	3,938.90	1,275.42	1.30	6,697.31
2000-05	21.00	2,235.00	1,009.80	168.00	40.35	0.00	3,474.15
Total	454.79	3,934.60	2,860.30	4,768.90	2,919.15	61.70	14,999.44

The disasters included are: drought; earthquake; epidemic; extreme temperature; famine; flood; insect infestation; volcano; waves/surge; fire; windstorm.

Source: "EM-DAT: The OFDA/CRED International Disaster Database <http://www.em-dat.net> - Université Catholique de Louvain - Brussels - Belgium"

The Economic Commission for Latin America and the Caribbean (ECLAC)¹ considers the following to be important aspects of an all-round development strategy:

- Competitiveness
- Equity
- Governability
- Reduction of vulnerability

Though the public sector is responsible for aspects of governability and also equity, the private sector can help by promoting competitiveness and reducing vulnerability (at least from a business perspective).

When faced with such considerations, one wonders whether there can be a single, standard response to any disaster, what the impact of a disaster would be on the private sector and whether there is only one impact.

We can start to answer these questions by defining two effects. The first, which we will term the *impact effect*, is the direct and immediate consequence of the disaster on the affected target group. The second effect, known as the *trickle-down effect*, is the medium and long-term consequences of the disaster that filter down through the economy due essentially to the target group's lost production capacity and buying power.

In economies such as the Central American economy, these effects have different impacts according to enterprise size since this region is home to a small and very dynamic group of enterprises (medium-sized, but above all large) that are competitive and integrated with the international economy, which exists alongside an enormous sector of small and microenterprises with very low levels of integration, whose dynamism depend to a large extent on domestic (or local) economic activity. In certain production sectors, the large enterprises may act as a driving force on the SMEs even though no direct link exists (e.g. as suppliers or distributors) between them. The effect of the disaster is therefore clearly differentiated and the responses cannot therefore be standard.

In the first case (large enterprises), if the impact effect

has given rise to damage in the business infrastructure, the other members of the production chain respond in the short term by delivering effective support, unless a general insurance policy is in place. The trickle down effect is inversely proportional to the number of contingency plans in the network (redistribution of work flows to other sites, presence of insurance policies, etc.), which allow the term of reconstruction to be extended with the support of a financial cushion.

This effect is determined by the enterprise's level of integration in international markets and the need to maintain efficient production in the chain. Although preventive measures are not always present, response to the event is fast so that production can be rebuilt and some costs can be reabsorbed. When the response is not so fast, the other links in the chain can absorb the cost and the infrastructure replacement time. One example of this is the rebuilding of the Cancun hotel area in the wake of Hurricane *Wilma*. Some hotels quickly began rebuilding while others (run by international chains) took longer because they were covered by an insurance policy and because they could redirect their customers to other tourist destinations run by themselves (or they could take advantage of the situation to carry out a full-scale refurbishment to offer something "different" to their customers).

In the second case (SMEs), both effects (*impact and trickle down*) are devastating for the enterprise and the local environment. When a small enterprise's production capacity is impaired, with no production chains acting as a failsafe mechanism and with the buying powers of its customers reduced by the disaster itself (or a significant reduction in customers, as in the case of tourism), no all-round response can provide such enterprises with a way out of the problem. The consequence is an imminent decline in the area's financial conditions unless safeguarding mechanisms are put in place by the State (whether national, regional or local).

Private measures must allow for differences between the various levels of enterprise while also analysing potential for joint action where an incentive exists to do so. Sectorial analysis seems to be an appropriate first step.

¹ ECLAC, Subregional Headquarters in Mexico, *El tema del desarrollo: la reducción de la vulnerabilidad frente a los desastres*, LC/MEX/L.428, 7 March 2000.

The case of tourism

In this case, the incentives arise out of the SMEs rather than the large enterprises. Destruction following a disaster determines changes in tourist flows in the short term. The large companies are relatively unaffected if they can redirect their tourist flows to other comparable destinations (as is the case with the large hotel chains, airlines, etc.). Large hotels/airlines or charter flights are, however, crucial to the production chains of SMEs (whether or not the two are directly linked). The reason is that these large infrastructures are responsible for attracting significant flows of tourists, who are responsible for activating the economic activity of small enterprises (craft industries, restaurants, clothing and footwear, local transport and other services).

In the short term and after a disaster, the potential for *local substitution* of the tourist demand (i.e. the possibility of replacing foreign tourism by local tourism) is low and the impact is less, due to the buying power of local tourists (at least in developing countries). Immediate public actions are also directed essentially at rebuilding the physical infrastructure for the civil population. The rebuilding of the economic infrastructure is low priority or less of a priority.

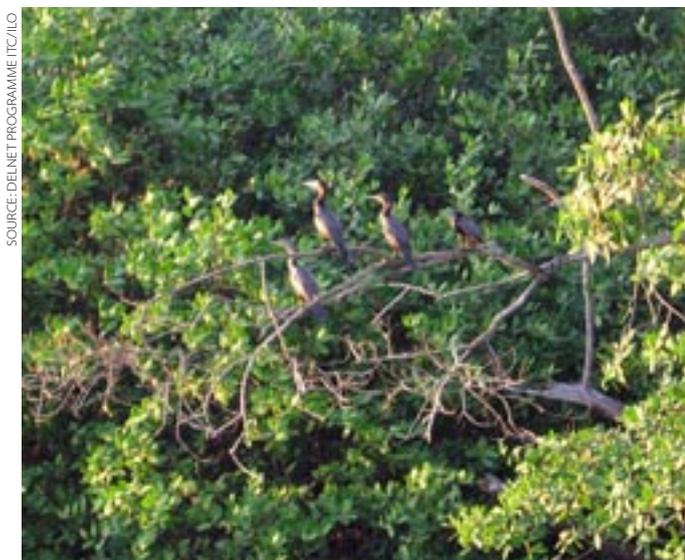
Hence the importance of coordinated public-private action, firstly to assess the extent of the damage and then to carry out an economic evaluation and also a physical evaluation. In such circumstances, identification of local leadership is crucial to ensuring coordination with local actors.

At a later stage, it is crucial to reactivate key economic activities to drive the production chain. This key link drives all aspects, from infrastructure to technical assistance. The building of local activities around the lead activity boosts the performance of these “follower” activities and allows recovery times and costs to be reduced.

At this stage, the forging of alliances between large and small enterprises is the start of integrated local reconstruction complemented by technical assistance arising out of joint economic evaluation of the damage conducted by the public and private sectors.

The need for joint public and private operations and joint ventures between large and small enterprises to form networks that allow disasters to be dealt with in a coordinated manner is crucial to reducing the vulnerability of the region and promoting truly sustainable development. ■

Costa Rica: The sub-regional office of SINAC (National System of Conservation Areas) in Saraquipí has coordinated different activities with the municipal environmental office and the other municipalities included in the Río Tárcoles basin (Pacific Coast). These initiatives, ranging from short workshops to strategic training, have the objective of getting local governments and enterprises involved into the sustainable management of the coastal mangrove forest.



Italy: Education in environmental culture

Antonio Varaldo

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Latitude: 45° N, Longitude: 8° E – This is Turin, Italy, in the heart of Western Europe, at the foot of the Alps, around the corner from France and one hour's drive away from the big city of Milan. It was the first capital of unified Italy almost one hundred and fifty years ago, and the host city of the Olympic Winter Games in 2006. It is the headquarters of major national industries and in the political, social and cultural avant-garde.

But let us rewind the tape to one year ago: 10 January 2005. It is a Monday, and school is starting again after the long Christmas break. Teachers and pupils, in both primary and secondary schools, are talking about the tsunami which burst into the holiday festivities on 26 December.

A week later, on 17 January 2005, the Ministry of Education publishes directives on secondary school reform. One of the changes is the suppression of a traditional subject – Earth Science – which includes astronomy, geology and physical geography. It was part of the A-level exam and a chance to promote environmental culture.

The combination of these two events brings out a clear dichotomy: on the one hand, the natural disaster revealed modern human inadequacy in our interaction with the environment; on the other, in the so-called “developed world”, which should lead in research and understanding of the planet's dynamics, school policies seem ambiguous. The question is how environmental education – especially on more urgent issues – should be developed. In other words, how important is ecology in our privileged and presumably well-educated, rich and technologically advanced western world? What are the school objectives? What values are shared by public opinion and official policy? What constructive role could we play regarding such immense disasters, which increasingly hit the poorest parts of the planet? And what about the environmental problems in the western world?

Here are some thoughts, though they have no ambition

to provide any definitive answers.

In the last few years, I have been working on an Earth Science school textbook, and I have had to go through the whole programme and revise it from a teaching perspective. In short, I identified all fundamental issues and the interplay of complex earth dynamics. To understand reality, every phenomenon needs to be looked at from a broad viewpoint.

Even if the subject is the point of departure for a modern environmental culture, we find that the teachers, regrettably, are graduates in biology or branches of biology; they therefore lack certain specific knowledge. Furthermore, the new policy has already been approved and natural science *per se* will not be included in the school curriculum.

Paradoxically, at the end of the 2005 school year, the A-level exam was specifically based on the relationship between humans and big natural disasters, inspired by recent notable insights. I read some A-level exam papers, and with disappointment I noticed that after 13 years at school, all those 19-year-old students could come up with were a few superficial ideas laden with convenient rhetoric. There was nothing wrong with them, but a global understanding of the phenomenon and its gravity – past responsibilities and future perspectives – was missing.

We Europeans are proud of the modern developed models which regulate our living together – including the rules of democracy, workers' rights and citizens' freedom. Nevertheless, the tragic event of December 2004 has reminded us how backward and inappropriate our approach to nature is. Schools bear some responsibility for this. Many discoveries have been made and Earth Science is the discipline which should analyse our progress in science over the last century as regards the ocean floor, plate tectonics, space exploration, climate change, hydro-geological instability, etc. However, there has been no adequate joint approach. The educational lacuna has developed into

an operational fissure in the absence of suitable monitoring strategies, data management or analysis of the many interactions on and inside our planet.

From my perspective, what is even worse is the total absence of a philosophy, a joint position on humanity's role in terms of values, needs and perspectives. It is not by chance that at school relevant subjects (such as philosophy or history) are approached in a lengthy retrospective, from ancient times to the modern era. How many students know that in the 19th century the planet was inhabited by one billion human beings, whereas today there are 6.5 billion of us? That life expectancy increased from 30 to 65 years in the last century and that the world population has doubled in the last 40 years? How 18th and 19th century innovative research on evolution, genetics and the human mind, on economics and on universal physical laws, is now valued? Our modern world is based on these things.

The term 'ecology' has the same root as 'economics' – *oikos*, which means house, habitat and, in a contemporary view, the earth system as a whole. Even the etymology of the two disciplines suggests how they should understand and regulate the planetary system (the former from the perspective of nature, the latter from that of resource management) with the ultimate aim of safeguarding its integrity and overall balance. Unfortunately, ecology calls for substantial methodological innovation, balancing research and implementation, whereas economics reveals deep doctrinal divides that undermine its initial ambition to be an ecumenical science. Nonetheless, it is unacceptable that six hundred million people are over-nourished and double that number have no drinking water; and that in south-eastern Asia, "development" has meant destroying coastal mangrove forests and building hotels and shanty towns.

So far, school has only partially dealt with pure environmental themes. In primary and middle school, geography and natural science teachers cover them only marginally, and high school books dedicate only brief sections to the human-environment relationship. As I said above, an innovative – meaning global and organic/holistic – approach is essential. This should also be reflected in book titles; I would prefer *The Human Planet* to *The Relationship between Humanity and the Environment* because it emphasizes that humans should consider themselves part of the Earth's ecosystem and responsible for guiding its develop-

ment and its dynamics.

Last summer and autumn, other natural disasters took place: hurricane Katrina in the Southern USA, hurricane Stan in Guatemala, and the devastating earthquake in Kashmir. I asked my 160 students and found out that half of them had sent an sms to help the tsunami victims last year, whereas less than 5% sent one for the earthquake (though it caused 47,000 deaths, half of them children). It is undeniable that the mass media – TV and newspapers – play a crucial role in reporting these events. Standards of scientific news are rather low, with admirable but rare exceptions.

The improper popularization of scientific knowledge goes hand in hand with a widespread tendency to include weather information in front-page headlines, making it sound sensational and catastrophic even when it is not. Similarly, reports of scientific discoveries or technological innovations are full of gaps and mistakes. It is obvious that the consequent ignorance on environmental topics makes people indifferent, even fatalistic. The outcome is discouraging, in terms of both knowledge and action.

Finally, a few recent examples reveal the problematic situation on a more regional level. In 1994 and 2000, two violent floods caused dozens of casualties and heavy damage in Piedmont (in the north-west of Italy). The deeply inadequate territorial planning revealed a huge gap between advances in scientific knowledge (in chemistry, biology, energy, hydro-geology, etc.) and unnecessarily complex and contradictory town-planning legislation. Waste disposal, recycling and pollution (of the air in cities, of rivers, seas and ground water tables) are impending dangers. On the one hand, this is the result of absolutely defective energy strategies; on the other, public management policies have missed the point.

The overall balance is not at all encouraging. It seems clear that the privileged parts of society, who have made progress with the development of a harmonious environment, are going adrift. They are victims of wrong past choices, unable to formulate and support a suitable cultural and educational model. However, those who still believe that sustainable development is possible must recognize that the only way forward is research, awareness-raising and dialogue. Schools have a primary role to play in all of this. ■

Disaster management as part of local planning

The experience of PROMIC and SDC in Tiquipaya, Bolivia

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This article discusses a personal experience as part of a multidisciplinary team working on a Risk Management Project in Tiquipaya, Bolivia. The author worked as a trainee for PROMIC¹ (Programa Manejo Integral de Cuencas) [Integrated Watershed Management Programme] with the support of the Swiss Agency for Development and Cooperation (SDC) as part of her Nadel postgraduate course.

Introduction

Risk Management is attracting more attention and its international importance has grown due to the frequency and intensity of natural disasters in recent years. Natural phenomena exacerbated by human actions can destroy and halt life in a community. The negative impact of disasters is so great that the local target group cannot tackle the situation with their own resources, particularly in the poorest countries with a low human development index.

As part of the Swiss Strategy for Disaster Reduction in Bolivia, a process was begun to identify specific actions designed to encourage disaster prevention within the various Programmes and Projects implemented by SDC in Bolivia².

To this end, PROMIC is currently implementing a pilot project *Participative Promotion and Institutionalisation of Risk Management within the Framework of Town Planning in Tiquipaya*.

Project goals³

The project aims to work together with the actors involved (local authorities and civil society in Tiquipaya)

¹ <http://www.promic-bolivia.org>.

² Source: <http://www.sgc-grcosude.com>.

³ Extract from the official project document.

Nadel is a Postgraduate Course in Development Cooperation

run by the ETH – Federal Institute of Technology of Zurich (Switzerland) and COSUDE in Berne that trains university graduates for cooperation in developing countries. The course consists of three parts: one semester of theory, a traineeship in a land project and one semester for developing newly-acquired knowledge and skills. More information at: <http://www.nadel.ethz.ch>.

Project area of influence:

The project is delimited geographically by the south face of the Tunari mountain range and the area affected by the Taquiña, Chutakawa, Khora Tiquipaya and Thola Pujru watersheds. Specifically, 4 villages in the Tunari mountain range (Linkú Pata, Cruzani, Totora and Thola Pujru) and Districts 4, 5 and 6 in the valley. The pilot project lasted one year (June 2005 - June 2006).



to identify risks and response capabilities present in the area. The final result of the project will be the drawing up of a Strategic Risk Management Plan for the Tiquipaya local authorities that also includes the conceptualisation and development of risk analysis support tools to be included in local planning resources.

Risk Management: a new concept for the local people and the authorities

Although the municipality of Tiquipaya is afflicted by floods, hail storms, ice and drought every year, Disaster Risk Management is not treated as part of local planning. The concept is new to the communities and also to local authorities and technicians. The communities generally organize themselves when a disaster happens, for example when the valley is flooded, but neither the governments nor the communities prepare to face future risks when the rainy season is over and this means that the same mistakes are made year after year.

Before looking the way we went about including the concept of risk in Tiquipaya's local planning activities, it could be useful to define Risk Management according to SDC⁴.

"Risk Management" is understood to mean the planning and execution of actions to prevent or reduce the effect of a disaster in a global manner, seeking ways to encourage each local authority to include the concepts of prevention and preparation in their strategic local planning development plans. Risk analysis is based on two essential components: 1) threat evaluation; 2) evaluation of vulnerabilities.

As far as threat evaluation is concerned, the first essential step is to be aware of potential causal factors of disasters. The essential requirement for the evaluation of vulnerability is to be aware of the level of exposure of the target group or infrastructure to the potential source of the threat and also its response capability. The "risk" is the potential for damaging consequences or losses to arise as a result of interactions between natural threats

or threats induced by human activity and a condition of vulnerability. By convention, the relationship between threat and vulnerability is described thus:



Procedure adopted in this specific case⁵

The Strategic Risk Management Plan drawn up involves various actors with the aim of identifying and complementing risks associated with natural phenomena. The two groups considered to be most important are: the target communities in the mountain range and valley and the municipal authorities and technicians. The procedure adopted was developed considering the following stages:

1. The baseline

The first stage of the project involved establishing a baseline in the mountain range and in the valley. The study units differed due to the different geographical conditions prevailing in the mountain range and the valley areas respectively. In the valley area – a peri-urban area – the study units were the housing blocks while in the mountain range, areas of dominant use such as farmland, pasture, woodland, etc., were considered. In both cases, different tools were used to identify threats and vulnerabilities, namely:

- Community workshops
- Semi-structured interviews
- Verification surveys
- Satellite photos of areas of dominant use and risk areas
- Various field databases for information gathering (databases for Grassroots Territorial Organization

⁴ Swiss Agency for Development and Cooperation (SDC), *Compatibilidad ambiental y prevención de desastres*, SDC, Managua, Nicaragua, March 2004.

⁵ Produced by the PROMIC team.

(GTO) managers, databases for GTOs and databases for blocks).

As far as satellite photos were concerned, mountain range participants identified the limits of their communities and described the various areas according to their land use (farmland, pasture, etc.). Valley participants delimited the areas of their own GTOs and their respective blocks. The existing infrastructures – whether these were industrial, educational or health establishments – were also identified. In both cases, areas likely to determine a certain level of risk were marked on satellite images of the project area.

2. Risk maps

At the second stage, all the geographical information collected was processed using GIS ILWIS software. 1:5000 and 1:7000 scale topographic plans or maps were taken as a basis.

The risk analysis was based on four main factors: threat, exposure, vulnerability and capabilities. Different indicators were established for each factor so that the information could be transferred to the GIS. A scale of 0 to 5 was used to describe the following categories: no risk, very low, low, moderate, and very high.

Lastly, a value was allocated to the various indicators so that we could adjust the results, which are weighted depending on the importance of the factor in relation to all the others.

The final outcome was a range of disaster risk maps.

3. Strategic Risk Plan

The provisional maps were used to develop a Strategic Risk Management Plan with the communities and local authorities through 3 stages (information, consultation and coordination).

This plan is a tool drawn up in accordance with committed actors that aims to encourage the introduction of processes that could reverse situations identified as problematic (unfavourable conditions) as far as the occurrence of risks of disasters is concerned.

Another complementary action carried out as part of

the pilot project was a communication and awareness stage to recover and strengthen the capabilities of the various actors in potential disaster situations and to promote the inclusion of a risk management component in municipal development planning processes.

To this end, we distributed leaflets covering key points for analysing threats and vulnerabilities to help strengthen local organizational capacity and procedures for tackling disaster situations. Radio slots (microprogrammes) were also broadcast through 3 local radio stations, taking advantage of the radio station coverage.

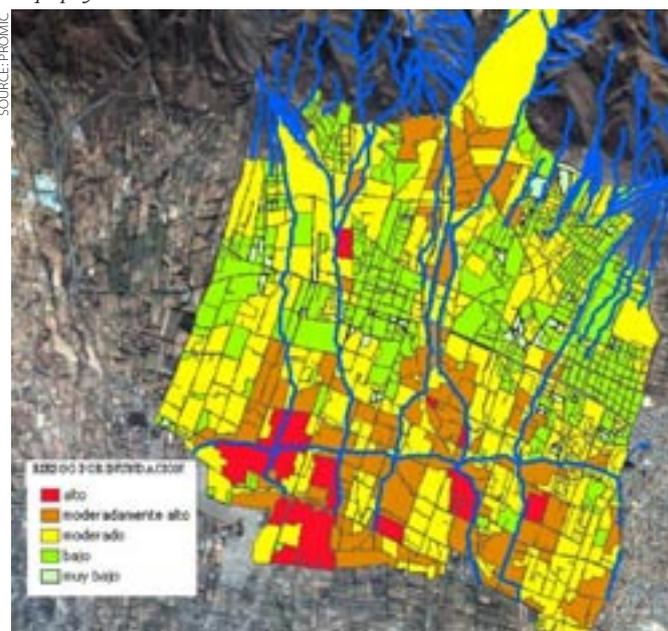
Since this was a pilot project, we cannot speak in terms of final results. Despite this, an important first step has been taken that, in the medium term, may help relatively small municipalities to improve the way they tackle disaster situations by considering the concept of Risk Management.

Lessons learned

After working for one year in the field of Risk Management in Bolivia, I wish to share the following experiences:

The increasing frequency and intensity of disasters

A first example of a Risk Management map in the municipality of Tiquipaya



throughout the world highlights the importance of including Disaster Risk Management in development aid as a specific and explicit factor: it is a key aspect of sustainability because it affects all dimensions of development (economic, social and environmental).

During the project, the local communities showed great interest in exchanging experiences and a high demand for information. Some communities expressed a certain level of disinterest due to the fact that their experience of disasters was negative. In other words, the local community is less interested in taking part in training workshops and flood discussion and analysis forums when the same problem arises year after year without the town council or prefecture bringing about any change in attitude by introducing specific disaster risk reduction actions.

The work carried out by PROMIC with the two actors (local authorities and civil society) highlighted the death of communication between the two actors in this specific area. This lack of communication has caused conflict between both actors, with both sides displaying prejudice and reproach.

“Risk management is not important in our municipality and there is no demand for it from the people”. These concerns were voiced to us on various occasions by the local authorities, despite the fact that the project objectives were clearly stated and shared from the outset. As we worked with the communities, we realised that the region is exposed to a high disaster risk and has been seriously affected on many occasions in recent years.

In other words, establishing a good level of organization and communication between actors would help us to tackle and reduce the severity of certain risks, above all those caused by human action (for example the rivers bursting their banks due to deposits of waste, failure to clean river beds, etc.). Greater damage could also be avoided by introducing laws and policies to deal with the problem of illegal settlements and mining in risk areas.

Lastly, the experience raised certain concerns about project planning, the actual level of participation and ownership. It is important to continue monitoring the consistent and active involvement of local government at both strategic and operational level throughout project implementation, even though this was a clearly stated aim in the official project documents.

A high level of cooperation between the executing agencies, the donors, the local authorities and the community is important in this regard. Project sustainability depends to a large extent on the level of participation of local authorities and empowerment of community actors: conditions are unlikely to improve in the area if the municipal authorities do not give their support and backing, however good the project is and however good its results.

Conclusion

Despite the existence in Bolivia of a law on Risk reduction (Law 2140 and 2335) and national papers such as the Strategy for Poverty Reduction in Bolivia (EBRP) and National Dialogue (Law 2235), Risk Management must still be included more systematically in all local government policies. It must be included directly, specifically and explicitly in national dialogues if it is to become an effective tool in the fight against poverty. Risk management should also be considered by the responsible actors at various government levels so that the topic is given due consideration in national, departmental and municipal planning.

To sum up, the *Risk Management in Tiquipaya* project is one of five risk management projects that SDC is running in Bolivia. Similar projects are also taking place in Peru and Ecuador. Such projects (in the 3 countries) are part of SDC national project and the experiences will inform SDC's new Disaster Risk Reduction strategy, which is the operational stage of the Hyogo Framework for Action: *mainstreaming disaster risk reduction into development*.

A Knowledge Management Secretariat (KMS) was set up to organize projects in Bolivia⁶. ■

⁶ More information available at <http://www.sgc-grcosude.com>.