

Hemispheric Risk Reduction Conference



Follow-up Contribution to the
"Third Summit of the Americas"
San Jose, Costa Rica, 4-6 December 2001

This publication is dedicated to the memory of Paul C. Bell, an expert in risk management and development who dedicated his life to humanitarian work in Latin America and the Caribbean and served as Chair of many events and initiatives, including the December 2001 Hemispheric Conference. Paul Bell passed away in San Jose, Costa Rica on 15 May 2003.

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ACS	Association of Caribbean States
BCIE	Central American Bank for Economic Integration (Banco Centroamericano de Integración Económica)
CAC	Central American Agriculture Council (Consejo de Agricultura Centroamericano)
CAF	Corporación Andina de Fomento
CAMI	Central American Mitigation Initiative
CARDIN	Caribbean Disaster Information Network
CARICOM	Caribbean Community
CAT	Early Warning Centre (Centro de Alerta Temprana) - Chile
CCAD	Central American Commission for Environment and Development (Comisión Centroamericana sobre Ambiente y Desarrollo)
CDB	Caribbean Development Bank
CDERA	Caribbean Disaster Emergency Response Agency
CDM	Comprehensive Disaster Management
CDMP	Caribbean Disaster Mitigation Project
CECC	Central American Education and Cultural Coordination (Coordinación Educativa y Cultural Centroamericana)
CEDEC	State Civil Defense Coordinating Body (Coordinadora Estatal de Defensa Civil) - Argentina
CEDERI	Disaster and Risk Studies Center (Centro de Estudios sobre Desastres y Riesgos)
CEMAT	European Conference of Ministers Responsible for Land Use Management
CEN	National Emergency Committee (Comité de Emergencia Nacional) - Paraguay

CENAPRED	National Disaster Prevention Center (Centro Nacional de Prevención de Desastres) - Mexico
CEP	Caribbean Environment Program
CEPRENAC	Coordination Centre for Natural Disaster Prevention in Central America (Centro de Coordinación para la Prevención de los Desastres Naturales en América Central)
CIDI	Inter-American Council for Integrated Development (Consejo Interamericano para el Desarrollo Integral)
CIDS	Inter-American Commission for Sustainable Development (Comisión Interamericana para el Desarrollo Sostenible)
CISMID	Peruvian-Japanese Centre for Seismic Research and Disaster Mitigation (Centro Peruano Japonés de Investigaciones Sísmicas y Mitigación de Desastres)
CNHAP	Canadian Natural Hazards Assessment Project
COMDEC	Municipal Civil Defense Coordinating Bodies (Coordinadora Municipal de Defensa Civil) - Argentina
CONAREC	National Commission for the Recovery of Areas Affected by Climatic Emergencies (Comisión Nacional de Recuperación de Zonas Afectadas por Emergencias Climáticas) - Argentina
CONRED	National Disaster Reduction Commission (Comisión Nacional de Reducción de Desastres) - Guatemala
CORDEC	Regional Civil Defense Coordinating Body (Coordinadora Regional de Defensa Civil) - Argentina
CRID	Regional Disaster Information Center (Centro Regional de Información sobre Desastres)
CSO	Civil Society Organization
CSUCA	Central American Higher Council for Universities (Consejo Superior Universitario Centroamericano)
DFID	United Kingdom Department for International Development
DHA	United Nations Department of Humanitarian Affairs
DIPECHO	Disaster Preparedness ECHO

DMFC	Disaster Mitigation Facility for the Caribbean
ECLAC	Economic Commission for Latin America and the Caribbean
ECHO	European Community Humanitarian Office
EPC	Emergency Preparedness Canada
ETO	Emergency Transportation Office
FEMA	Federal Emergency Management Agency - U.S.
FEMCIDI	Special Multi-Objective Fund of the Inter-American Council for Integrated Development (Fondo Especial Multi-objetivo del Consejo Interamericano para el Desarrollo Integral)
FEMID	Disaster Mitigation Local Structural Strengthening (Fortalecimiento Estructural Local para la Mitigación de Desastres)
FIA	Federal Insurance Agency
FONDEM	Inter-American Fund for Emergency Situations (Fondo Interamericano para Situaciones de Emergencia)
FTAA	Free Trade Area of the Americas
GADE	Cabinet Ministers' Emergency Board - Argentina
GIS	Geographical Information System
GPS	Global Positioning System
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit GmbH (German Technical Cooperation Agency)
IACNRD	Inter-American Committee for Natural Disaster Reduction (Comité Interamericano para la Reducción de los Desastres Naturales)
IADB	Inter-American Development Bank
IDNDR	International Decade for Natural Disaster Reduction
IFRC	International Federation of Red Cross and Red Crescent Societies
IPCC	Intergovernmental Panel on Climate Change

ISDR	International Strategy for Disaster Reduction
IUTE	Instituto de Tecnología de Ejido - Venezuela
LA RED	Network for the Social Study of Disaster Prevention in Latin America (Red de Estudios Sociales en Prevención de Desastres en América Latina)
MARLAH	Local Risk Management Project in Ahuachapán (Proyecto Manejo de Riesgo Local en Ahuachapán) - El Salvador
MERCOSUR	Southern Cone Common Market
MHM	Multiple Hazard Maps
NDMS	National Disaster Mitigation Strategy - Canada
NEMA	National Emergency Management Association
NEMO	Network of State Hazard Mitigation Officers
NOAA	National Oceanographic and Atmospheric Administration
OCIPEP	Office of Critical Infrastructure Protection and Emergency Preparedness - Canada
OAS	Organization of American States
OFDA	Office of U.S. Foreign Disaster Assistance
ONEMI	National Emergency Bureau (Oficina Nacional de Emergencia del Ministerio del Interior) - Chile
NGO	Non Governmental Organization
PADRO	Pan American Disaster Response Organization
PAHO	Pan American Health Organization
PED	Program on Emergency Preparedness and Disaster Relief (PAHO) (Programa de Preparativos para Situaciones de Emergencia y Socorro en Casos de Desastre)
PIDS	Inter-American Program for Sustainable Development (Programa Interamericano para el Desarrollo Sostenible)
PMP	Preparedness, Mitigation, Prevention

PREANDINO	Regional Program for Risk Prevention and Reduction (Programa Regional para la Prevención y Reducción de Riesgos)
PRECLIF	Forest Fires Local Prevention and Control Project (Proyecto Prevención y Control Local de Incendios Forestales)
RESSCAD	Central America and Dominican Republic Health Sector Meeting (Reunión del Sector Salud de Centroamérica y República Dominicana)
RUTA	Regional Unit for Technical Assistance
SEDEC	National Civil Defense Department (Secretaría Nacional de Defensa Civil) - Argentina
SEGEPLAN	Planning Department (Secretaria de Planificación) - Guatemala
SICA	Central American Integration System (Sistema de Integración Centroamericano)
SIFEM	Federal Emergency System (Sistema Federal de Emergencias) - Argentina
SINAPROC	National Civil Defense System (Sistema Nacional de Defensa Civil) - México
SINDEC	National Civil Defense System (Sistema Nacional de Defensa Civil) - Argentina
SNPAD	National Disaster Prevention and Response System (Sistema Nacional de Prevención y Atención a Desastres) - Colombia
SUMA	Humanitarian Supply Management System (Sistema de Manejo de Suministros Integrados)
UDSMA	Environment and Sustainable Development Unit (Unidad de Desarrollo Sostenible y Medio Ambiente)
UICN	International Conservation Union
UN	United Nations
UNDP	United Nations Development Program
UNEP	United Nations Environment Program

UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
USDOT	United States Department of Transportation
UWI	University of the West Indies
WFP	World Food Program
WHO	World Health Organization
WHTI	Western Hemisphere Transportation Initiative
WMO	World Meteorological Organization
WSSD	World Summit on Sustainable Development

PRESENTATION

The Hemispheric Risk Reduction Conference was held 4-6 December 2001 in San Jose, Costa Rica. About 550 participants from all parts of the hemisphere met in plenary sessions and workshops to discuss the implementation of the risk management mandates developed at the Third Presidential Summit in Quebec (April 2001). The Hemispheric Conference is the risk management event with the highest attendance in the region.

Planning for the meeting was the responsibility of an Organizing Committee, composed of United States Government agencies including the Department of State, the U.S. Agency for International Development (USAID) and the Office of U.S. Foreign Disaster Assistance (USAID/OFDA); the Organization of American States (OAS); the Pan American Health Organization (PAHO/WHO); the Inter-American Development Bank (IADB); the Caribbean Disaster Emergency Response Agency (CDERA); the Coordinating Centre for the Prevention of Natural Disasters in Central America (CEPREDENAC); the Corporación Andina de Fomento (CAF); the UN International Strategy for Disaster Reduction (ISDR); and representatives from Canada, Argentina and Costa Rica.

The Conference was chaired by the Administrator of USAID, Andrew Natsios; the U.S. Ambassador to Costa Rica, John J. Danilovich; the Sub-Director of PAHO/WHO, Mirta Roses Periago; a representative of the Government of Costa Rica, Patricia Vega; Paul Spencer of OAS and Salvano Briceño Director of ISDR. The plenary sessions dealt with topics such as the link between the Conference and the mandates of the Summit of the Americas in Quebec, democracy and disasters, national risk reduction systems, information management and public awareness, and international players in this area.

One innovative approach taken at the Conference was the introduction of work groups by sector (food security/agriculture, education, health and critical facilities) that interacted with groups organized by cross-cutting themes (finance, civil society, information technology, and land use management). This design allowed space for discussion that reflected the trans-disciplinary and trans-sectoral nature of risk reduction. The diversity of the contributions, the multiplicity of interests and the growing expectations demonstrate the emergence of a new, long-term vision for risk management. Accordingly, risk management and risk reduction in particular require a strategy that transcends a single discipline, moves beyond the scope of traditional disaster management institutions, and ultimately becomes a societal value.

This report is a summary of the issues discussed at the meeting, and has been reviewed by experts to create a comprehensive and uniform reference document that presents a trans-sectoral, multi-disciplinary and hemispheric overview of the current status of risk reduction and new trends. The report may be read from beginning to end, or consulted for particular chapters of interest to the reader.

HEMISPHERIC RISK REDUCTION CONFERENCES SPEAKERS

Inauguration of the event

- Presentation of the Hemispheric Risk Reduction Conference
- John J. Danilovich, Ambassador of the United States in Costa Rica
- Dr. Mirta Roses, Assistant Director of the Pan American Health Organization / World Health Organization
- Andrew Natsios, Director of the United States Agency for International Development
- Patricia Vega, Vice-Minister of the Presidency of Costa Rica

Introductory session

- Link with the Third Summit of the Americas. Québec City, April 2001
Louise L. Léger
Ambassador of Canada in Costa Rica
- Organization of American States and the Summit mechanism
Paul Spencer
Words by the Advisor to the Secretary General of the Organization of American States
- Historic Perspective of the Americas
Richard S. Olson
Professor, Department of Political Sciences, Florida International University
- Review of Disaster Reduction Trends in the Americas
Sálvano Briceño
United Nations – International Strategy for Disaster Reduction

Discussion panel with sub-regional representatives

Plenary session

- Andean Region - Tanya Corrales, Corporación Andina de Fomento
- Caribbean - Donovan Gentles, Caribbean Disaster Emergency Response Agency
- Central America - Jorge Ayala, Coordination Centre for Natural Disaster Prevention in Central America (Centro de Coordinación para la Prevención de los Desastres Naturales en América Central)
- North America - Chris Tucker, Office of Critical Infrastructure Protection and Emergency Preparedness, Canada
- Southern Cone - Nelly Gray, Ministerio de Ambiente y Obras Públicas, Argentina

Sectoral presentations

Plenary session

- Education - Pedro Bastidas, Organization of American States
- Health - Claude de Ville de Goyet, Pan American Health Organization / World Health Organization
- Food Security/Agriculture - Benjamín Jara, Inter American Institute for Cooperation in Agriculture - Hernán Delgado, Nutrition Institute for Central America and Panama
- Critical Facilities - Stephen Bender, Organization of American States

Democracy and disasters

Parallel plenary session

Panel 1

- Eduardo Stein, Guatemala
- Rashim Ahluwalia, Pan American Health Organization / World Health Organization
- Richard Olson, USA
- Inés Useche de Brill, Colombia

Panel 2

- Lenkiza Angulo, PREDES, Peru
- Rosa Sánchez, GTZ, Guatemala
- Enrique Tula, RED-COMAC, Costa Rica
- Bruno Podestá, Uruguay

National systems

Parallel plenary session

Panel 1

- Camilo Cárdenas, Colombia
- Chris Tucker, Canada
- Alejandro Maldonado, CONRED, Guatemala
- Tanya Corrales, Corporación Andina de Fomento
- Marco Antonio Rodríguez, Ministerio de Desarrollo Sostenible, Bolivia

Panel 2

- Omar Darío Cardona, Colombia
- Barbara Carby, Office of Disaster Preparedness and Emergency Management, Jamaica
- José Alarcón, Secretariado Técnico de la Presidencia, Dominican Republic

Public information and awareness raising

Parallel plenary session

- Ricardo Pérez, Pan American Health Organization
- Xavier Castellanos, International Federation of Red Cross and Red Crescent Societies
- Ennar Arriojas, Instituto de Protección Civil del Chacao, Venezuela

Internationals players

Plenary session

Panel 1

- Eduardo Angeloz, White Helmets
- Wolfgang Stevens, GTZ (German Technical Cooperation Agency)
- León Prop, International Federation of Red Cross and Red Crescent Societies
- Kari Keipi, Inter-American Development Bank
- Casandra Rogers, Caribbean Development Bank
- Jean Luc Poncelet, Pan American Health Organization
- Robert Kahn, United States Agency for International Development
- Juan Pablo Sarmiento, Office of Foreign Disaster Assistance

Panel 2

- Alberto Maturana, Oficina Nacional de Emergencias, Ministerio del Interior, Chile
- Eleonor Jones, Environmental Solutions, Jamaica
- Elizabeth Cubias, Cancillería de la República, El Salvador
- Eduardo José González, Dirección General Prevención y Atención de Desastres, Colombia

Conclusions on cross-cutting themes

- Finance – Sergio Mora, Inter-American Development Bank
- Civil Society – Nora Villegas, Colombia
- Information Technology/Connectivity – David Novello, CEPREDENAC
- Land Use Management – Nelly Gray de Cerdán, Ministerio de Ambiente y Obras Públicas, Argentina

Sectoral discussion panel on conference results

- Education - Manuel Ramírez, Office of U.S. Foreign Disaster Assistance
- Health - Jean Luc Poncelet, Pan American Health Organization / World Health Organization
- Food Security/Agriculture - Hernán Delgado, Nutrition Institute for Central America and Panama
- Critical Facilities - César Manzur, Consultor

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Kim Plikaitis
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In addition, final revision of the English and Spanish texts was done by Patricia Bittner and Ricardo Perez, respectively, both from the PAHO/WHO Program on Emergency Preparedness and Disaster Relief.

INTRODUCTION

“WHY THIS MEETING, WHY NOW?”¹

Introduction

Colleagues, guests, friends, fellow panelists, it is truly an honor to be here and to offer some remarks on the history and historical development of disaster management in the Americas. Before leaving Florida International University for the airport, I was thinking about the “one picture is worth a thousand words argument,” and I would like you to think back to Hurricane Mitch just before it made its famous hard left turn into Central America because it exemplifies, in many ways, the problems that we face in the hemisphere.

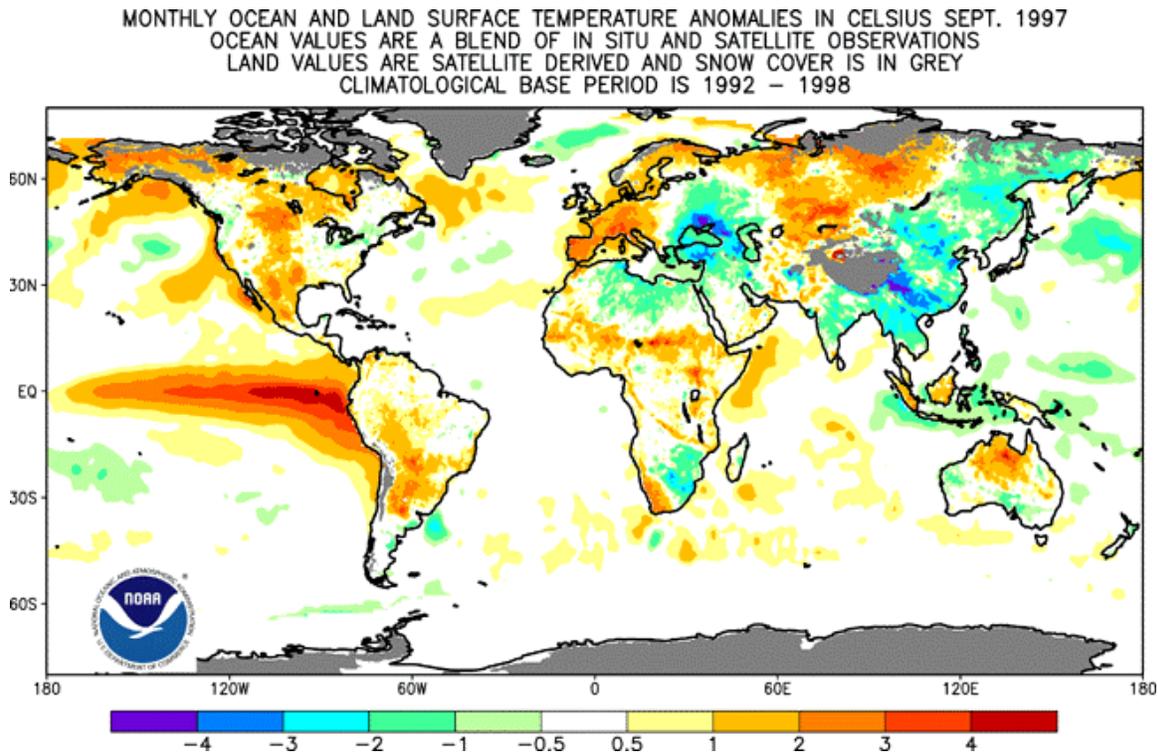


PHOTOGRAPH OF HURRICANE MITCH

¹ Richard S. Olson, Ph. D. of the Department of Political Sciences, Florida International University, Miami, Florida, prepared this chapter.

As you all know, when this storm finally ran its course, we had catastrophic damage in two countries and serious damage in two more. Mitch was essentially a sub-regional disaster. Moreover, those of you in Central America and the Caribbean know that when a storm like this approaches, entire countries disappear—for one day, two days, even three days—a fact that must be kept in mind. For large countries, and this is something missed in the United States fairly often, they don't have to contemplate the problem of their national territory figuratively disappearing from the map—or these days even more importantly from satellite photos—for 24 to 72 hours. For those of you representing countries that are at times dwarfed by a natural event, you know that Hurricane Mitch was not a unique occurrence.

In fact, to take another example, consider this temperature gradient representation of the famous “El Niño” of 1997-1998, where the ocean surface temperature rise is appropriately colored red.



ENSO 97-98 TEMPERATURE GRADIENT MAP

As you know, the so-called El Niño-Southern Oscillation (ENSO) is a periodic but irregular hemisphere-wide or at least hemisphere-affecting phenomenon of one to two years severe duration. Although ENSO tends to be concentrated in their more vivid effects on the Andean countries of Peru, Bolivia, and Ecuador, they are disasters that affect an entire region and by global climatic extension, the world.

A Hazardous Hemisphere

Now let us turn to the central question of “Why are we here”? The answer in part is because of the number of hazards affecting the hemisphere and in part because of their nature. We have virtually every natural hazard that the standard academic textbooks list: earthquakes, volcanoes, hurricanes, floods, landslides, droughts, et cetera. You know all this. We have been fortunate in suffering relatively few technological disasters (major explosions and toxic spills), the PEMEX events in Mexico City and Guadalajara standing out, however, as notable exceptions.

Consider that in the last 72 months, a quick calculation of the major disasters in this hemisphere shows four major earthquakes (one in Peru, two in El Salvador and one in Colombia), the landslide in Venezuela, Hurricane Georges in the Caribbean (especially affecting the Dominican Republic and Haiti), Hurricane Mitch in Central America, and a strong El Niño off the coasts of Perú and Ecuador that went on for two years.

Parenthetically I could now also include a terrorist attack in the United States, which has brought home to my country the whole issue of disasters as national marker events, a possibility not previously conceived of in the United States but completely familiar to many countries represented here. Truly, if you haven’t been through the United States airport system lately, there is a “before” September 11, 2001, and there is an “after.” Although the effects will fade psychologically a bit over time, a fundamental alteration in attitude and thinking has occurred.

The list of historic disasters—even if only these recent ones—may explain why we are here, but it doesn’t explain why we are here in such numbers. I don’t believe that it’s a secret, and perhaps the conference organizers don’t want me to share it, but this was originally foreseen as a meeting of 100, at most 150 people in one hotel. If you didn’t know it, more than 500 people were registered for this meeting as of last night, and the meeting now involves five different hotels. This unexpected level of participation gives added urgency to my presentation, especially for those individuals who have not been to this type of meeting before. More than a few of us who have been around for a couple of decades are stunned by how we come to be here in such abundant numbers.

I am going to offer you two linked political reasons why we are here and why there are so many of us. The first reason, and I can say this with both respect but also frankness because I don’t work for a government agency: *The old paradigm for preparing for and then responding to disasters has essentially failed.* As painful as it might be to admit, preparedness and response mechanisms are so inherently limited that we have come to realize intellectually that the response paradigm is exhausted. In some ways it has ended well—with noble efforts in a multitude of disasters—but it is over.

The mounting losses tell us that the old paradigm has ended in failure.

The second political reason that we’re here, in my estimation, is that disasters are now finally also recognized as too important to leave to disaster specialists, “the disastrologists”

as we are sometimes called. Disasters are understood as a much more complicated and larger problem now. Let me explain.

In the last decade and without much notice, the classic preparedness and response paradigm of the past 40 years reached its practical limit in many countries of the hemisphere. It turned out that most organizations charged with responding to disasters could handle relatively small to medium sized events, but they were severely outmatched by the increasing number of truly frightening major events. With all due respect, they were clearly under-funded and under-staffed to deal with major events, and they don't have enough political "palanca," political leverage, to actually carry out their legal responsibilities, their missions. So when they were confronted with major events, they went into performance crises, understandably, but crises nonetheless. They were then marginalized operationally, organizationally, and even more importantly politically.

To explain, a major disaster reveals the fundamental deficiencies of disaster management ("gestion") organizations in the hemisphere. In fact we have been a little careless with our language. We don't actually manage disasters. In most cases we are run over, in Spanish "somos atropellados" by disasters, and all we really do is clean up the debris afterwards. We may use the language of management, but a lot of times we are just coping—often minimally—with the effects.

The problem is that the overall situation won't change. We are in an era, we have been living through an era, when government, "el estado"/the state, has been shrinking under the ideology of neo-liberalism. Government has shrunk, and this means that the best that a government can normally do now is to coordinate individual ministries, civil society, NGOs, and external donors in a major event. They are essentially too weak to do much else. That is a reality. We must admit it—and move on.

The solution, the only solution anymore, is to bring disasters down closer to our response capabilities. If we accept with frankness that our response capabilities might be improved, refined, and detailed but that they will not be substantially enlarged without a huge outlay of resources that don't exist, the only logical solution is to bring the disaster impacts down to our relatively stable and modest response capabilities. This is why Risk Reduction is absolutely crucial, for there is obviously no other way to bring the disaster losses down. For those of you familiar with the semantic intricacies of extreme events, we have to take catastrophes and make them disasters and make disasters into mere emergencies. If we do that, then we will be much closer to matching event effects with our actual response capabilities.

It has taken courage to recognize this fundamental problem. I have to point out that leaders in this effort at candor have run considerable personal and bureaucratic risk in the last 10 years especially. Such leaders can be found in the Organization of American States, AID, OFDA, the Pan American Health Organization, the Red Cross, LARED, and within academia. Especially in Latin America, they have been making these points for several years and have forced a recognition that the old paradigm had reached its limit. They deserve credit for this because unlike in my case, most actually work for government

agencies and have political bosses. Nonetheless, they evidenced incredible courage to put the paradigm failure issue on the table.

The key to improving risk reduction in the Americas, however, lies overwhelmingly with the respective nations' political and economic elites because in the end, helping protect people from natural and technological hazards—reducing their *vulnerability*—is a prime moral responsibility of a nation's leaders and their concept of community and national development.

Indeed, the problem of disaster vulnerability is largely contained within the problem of development. For example, it is almost always the poor who suffer most in disasters, and therefore reducing poverty will—by itself—go a long way toward reducing societal vulnerability and future disaster losses. Reducing poverty, however, requires that the political class and the economic elites in the various countries balance wealth and income *creation* with efforts to assure more equitable income *distribution* so that, at the very least, societal vulnerability to disaster is not actually increasing.

More specifically, we have to acknowledge that mal- or mis-development plays an important role in disaster creation. Poorly conceived, poorly sited, and poorly constructed factories, office buildings, apartments, or residential developments are “disasters waiting to happen.” On the surface, they may appear beneficial and sometimes even spectacular, but they often prove in the long-run to be development mistakes, not development successes. Avoiding such mistakes and making hazard-sensitive development decisions, however, requires combining substantive participation at the grassroots level with moral and intellectual courage from community leaders and the political class generally. In the end, disasters are political and therefore so must be risk reduction efforts. The problem is that risk reduction requires consciousness, integrity, and leadership at all levels.

Conclusion

There is an old saying that wars are too important to be left to generals (generals don't happen to agree with that old saying), but in the case of disasters we have reached the point where disasters and disaster risk reduction can no longer be left to disaster specialists. Disasters have escaped the box. If you look around this meeting, you will see the results of the “disaster problem” escaping the old specialist and response-oriented definition, escaping the old box.

We have to attack disasters proactively, we have to attack them multi-sectorally, and we have to attack them ahead of time. We can't wait for disasters and then respond. We know that. Passive waiting and then attempting to respond is a recipe for operational failure and human tragedy. Response is increasingly a dead end street to address disasters. We have to address risk. That is truly why we are here, why we are here now, and why this meeting does not look anything like similar meetings held 20 and even 10 years ago. The old paradigm has ended, the new one is being created, and you are part of that creation.

Thank you very much.

RISK REDUCTION CONFERENCE OPENING REMARKS²

Mr. Ambassador, friends..... ladies and gentlemen:

It is a great pleasure to be here today and have the opportunity to speak to you about a topic of great significance to our entire hemisphere - how we can build on what we have learned so that future disasters impose less harm on our citizens and our societies.

Let me begin by thanking the Government of Costa Rica for hosting this event along with my own agency's Office of U.S. Foreign Disaster Assistance. I would also like to thank the Pan American Health Organization for all that they did to help make this conference possible. And thanks goes to the Organization of American States and the Inter-American Development Bank, too, for their support as well as to the Hemispheric Steering Committee for all the work that went into planning this conference.

At the Third Summit of the Americas meeting in Quebec City this April, President Bush stated: "We have a great vision before us, a fully democratic hemisphere bound together by goodwill and free trade. That's a tall order. It is a chance of a lifetime. It is a responsibility we all share." He went on to say: "The discussions we hold, and the mandates we produce, must help improve the lives of people throughout our hemisphere. The summit is given meaning and value by concrete results."

Those concrete results he referred to are precisely why we are here today. The way we manage the natural disasters that hit our countries has a direct and immediate effect on people's lives and the well-being of our societies. Managed correctly these disasters can be temporary inconveniences. Managed poorly, they can bring down governments and leave a legacy that lasts for years.

Take, for example, the Nicaraguan earthquake of 1972. The way the government mishandled the relief effort left a bitterness among the population that contributed directly to the Sandinistas' rise. Similarly, many date the beginning of the end of the Soviet Union to the inept way Moscow handled the Armenian earthquake of 1987.

The frank recognition of the dangers and human and economic costs of mismanaging disasters is why the Summit's *Plan of action* included the Disaster Management Initiative among its goals. We simply cannot do our part to "strengthen democracy, create prosperity and realize human potential" in accordance with the *Plan of Action* unless we manage disasters in a consistently professional manner and take advantage of the techniques and technologies that have been developed in recent years.

I believe we need to look very seriously at market-based incentives as a way to improve our performance. We need to change behavior patterns if we want to save lives, revenues and property. We all know the risks involved in allowing people to build on flood plains or near volcanoes. But we do not always know how to prevent it short of instituting the

² Andrew S. Natsios, Administrator of the United States Agency for International Development (USAID).

draconian measures most governments refuse to take.

The best way to encourage people to do what is right, I would argue, is through market incentives. They are simply more effective than setting rules and imposing fines which may or may not ever be collected.

Let me give you an example of how this can work.

Several years ago, USAID initiated an agro-forestry project in Haiti. You all know the terrible problems they have there with deforestation and how that has markedly increased the number of mudslides, floods, and the depletion of the soil. We knew that if we just planted trees, many of them would be cut for firewood before they could grow. So what we did was to provide Haitian farmers with a small subsidy to plant and care for their trees. Then, once the trees matured and the farmers began to reap the benefits - whether in fruit, charcoal, lumber, or firewood - the subsidies were no longer necessary. And the trees stayed, helping the country slow the rate of deforestation.

There are a number of other measures we might consider, too, such as tax policy. That can make a significant difference. Let me give you an example. When a major earthquake struck northwest Turkey in August of 1999, almost 24,000 people were killed. Sound construction practices could have prevented many of these deaths. A lot of the homes were built according lax safety codes.

But even worse were the property tax laws, which acted as a disincentive to sound construction practices. At the time, buildings were assessed according to the space they occupied at ground level. Therefore, many developers built their structures on pillars, so that their taxes would be limited to the amount of ground the pillars stood on.

Clearly, governments would be wiser to lower people's taxes if they conform to good building code standards and raise them if they do not. Similarly, those who built in flood plains or along the seashore could be taxed at a higher rate.

Such practices, of course, are common in the insurance industry -- in some countries. But in others, I suspect, this is not the case. It certainly should be.

The insurance industry is already involved in detailed hazard mapping and assessment; they probably have more data on these matters than anyone. They could do their countries a great service by sharing that information more fully with disaster management professionals and community planners and officials.

In any event, in countries where many dwellings are not insured, it would make sense for the local government to step in and use the tax structure to encourage people to build according to strict safety codes. People's lives, after all, depend on it, and governments exist to serve the people.

Banks could play a role here, too, by charging higher mortgage rates for property that is not built to code.

Another idea we ought to consider is training small contractors and carpenters particularly those who operate in the informal market - in safety codes and proper construction techniques. This would reach what the Peruvian economist Hernando de Soto calls the "informal sector" which accounts for more than half the housing in some of this hemisphere's cities. For we all know that it is precisely the hastily and poorly constructed dwellings where the most damage occurs during earthquakes, mudslides, hurricanes, or floods.

Ensuring that disaster management professionals receive the proper training, of course, is the key to reducing the economic and human loss associated with severe natural disasters. As such, it is essential that we constantly review our disaster management training programs to make sure they take account of the lessons we have learned, both good and bad.

Most of you are familiar with the Risk Management Training Program that we set up more than a decade ago. This, I think, is an excellent example of what we can do when we work together to institute the best practices and policies disaster professionals have learned over the years.

As you may recall, in 1985 and 1986, a series of major earthquakes shook Mexico, Chile, and El Salvador and a severe volcanic eruption took place Colombia. Altogether, these caused more than 40,000 deaths. The magnitude of the destruction revealed the inadequacy of local emergency preparations and the inability of local authorities to respond effectively on their own. USAID, of course, provided assistance in each case, but still, the lack of trained officials on the ground convinced us all that things must change. The result was that OFDA began working with other countries in the hemisphere to develop the training program.

The goal of the program is to achieve self-reliance in disaster training and response throughout Latin America and the Caribbean in order to save lives and reduce human suffering. To this effect, we work with host countries to identify training needs, develop appropriate courses, provide necessary skills, and train instructors so that these courses can be replicated.

Since its inception, we have trained more than 20,000 disaster management personnel and this is not counting the many who were trained at the local level by those who had received our training. Another achievement of which I am particularly proud is the fact that permanent national training programs have now been formally integrated into the national emergency management organizations of 13 countries in the region.

We can see the results this training has produced in terms of lives saved, resources preserved, and national institutions strengthened. When an earthquake measuring 8.4 on the Richter scale struck southern Peru on June 23, local personnel who had received OFDA training provided critical emergency assistance to the affected areas.

Just prior to the earthquake, OFDA had helped the government strengthen its first responder program in southern Peru, working with the civil defense, the Ministry of Health, and the voluntary firefighters. This enabled them to conduct search and rescue activities without turning to the international community for assistance.

That is the kind of success we all can appreciate.

By contrast, when the terrible rains of December 1999 hit northern Venezuela, "there were no national or community disaster preparedness plans or appropriate early warning systems," according to the Worldwatch Institute. We are in the business of saving lives. None of us takes the least pleasure in another country's failures. But we have to learn from our mistakes. Many of those deaths could, and should, have been avoided.

Just the year before, Hurricane Mitch struck, resulting in a loss of many, many lives and homes and businesses. One of the ways we responded was to begin working with the countries in the region on the Central America Mitigation Initiative. Since then CAMI has focused on strengthening the ties between local, regional, and national authorities and those organizations responsible for risk management and disaster response.

The effectiveness of this training was put to the test last month when Hurricane Michelle dumped more than twice the rain in Honduras that Mitch had produced in places three years before. Disaster response personnel, who participated in a major simulation we helped sponsor earlier in the year and who had received OFDA training, organized a highly effective response to the flooding and avoided the major loss of life which resulted from Mitch.

There were other lessons we learned from Mitch, as well. Within a few months, the United States had put together the largest disaster response package in our history, \$300 million. We followed this quickly by a reconstruction package of \$621 million for the countries of Central America and the Caribbean that were hammered by Mitch and Hurricane Georges, and led a coalition of donors which pledged \$9 billion to the region.

The amount of the assistance, however, is less important than the lessons that were learned. The most effective and enduring disaster and reconstruction work occurs when decisions incorporate the local points of view, when municipalities and civil society groups participate and the entire process is open, inclusive, and transparent.

I certainly hope one of the outcomes of this conference will be a commitment to new partnerships between governments, private industry and local citizens' groups.

Ten years ago, when I was the director of OFDA, we worked with the Organization of American States to develop the Caribbean Disaster Mitigation Project, or the -CDMP, to strengthen public/private sector partnerships with a view toward reducing the impact of disasters.

For much of the 1990s, the CDMP was the only major disaster mitigation program in the Caribbean, and the only one which tried to leverage the resources of the private sector and

development finance. The project was not a complete success, but it did manage to establish the critical link between natural disasters and development.

In this context, the OAS began working with the Caribbean Development Bank to incorporate hazard information into its project appraisal process. The CDB subsequently produced a disaster management policy and later obtained a grant from OFDA to put its policy into practice and introduce hazard mitigation concerns into all aspects of its operations. (This is the Disaster Mitigation Facility for the Caribbean, or DMFC).

We have made tremendous strides in technology over the past decade which give us amazing new tools to respond quickly to emergency needs in the immediate wake of a disaster. With satellite phones, we can call in assessments from the most remote villages in the hemisphere. Computer software, such as the Relief Supply Management System, helps us match unmet needs with available assistance.

And yet the knowledge and great technological advances we have made are not always put to use. Information is not always shared. The proper coordination between local communities and national authorities is not always what it should be. This needs to change. Indeed, assuring the proper coordination among all sectors of society is part of the reason we are here today. We are democratic nations and we owe it to our people to be sure that every group has the information it needs to do its part in safeguarding society.

I cannot conclude my remarks without taking a moment to recognize the lifelong accomplishments of Claude de Ville, Chief of Emergency Preparedness at PAHO. Claude is an institution unto himself in the field of disaster management. He will be retiring this year, and I wanted to thank him personally for his tremendous commitment to saving lives and alleviating human suffering throughout the Americas. As a founding father at PAHO, Claude has been a good friend and partner to all of us, a thinker, an innovator, and a tireless advocate for human decency for over four decades. I am sure all of us who are concerned with reducing risk and vulnerability in the face of recurring natural hazards will miss him deeply.

And now, let me thank you for inviting me here and wish you all a most useful and productive conference.

RISK MANAGEMENT³

Introduction

In order to deal with the issue of risk management, it is necessary to understand the evolution of this concept. Traditionally, disaster management has focused on anticipating and responding to natural and man-made hazards. Recently, however, attention has shifted towards gaining a better understanding of the variables that determine the intensity and extent of disaster impacts. Awareness of these underlying conditions has fostered the need to design and implement mechanisms that can eliminate the actual causes of disasters, or, if this is not possible, at least mitigate their impact.

Although some simply pay lip service to the idea of risk management, to others it has become an emerging alternative to break the vicious circle into which disaster management has fallen. The concept of risk management, with its long-term vision, has altered the way in which short-term circumstances are viewed. This new approach is a strategy rather than a discipline, and is the result of multi-sectoral, inter-disciplinary actions by individuals and institutions. With time, risk management may become a highly-prioritized value among societies.⁴

Defining Risk

Given the broad range of disciplines involved in disaster work, it is important to define the most frequently used terms to facilitate communication and information exchange. The following common terms are taken from the Glossary, which includes a compilation of basic terms and their meanings according to recognized sources.

Hazard: An external risk factor represented by the potential occurrence of a natural or man-made event that can occur in a specific place, with an expected intensity and duration.

Vulnerability: An internal risk factor of a person, object or system exposed to a hazard, which corresponds to how it may be affected.

Risk: The probability of exceeding a specific level of social, environmental and/or economic damages, over a predetermined period of time.

“Acceptable risk” refers to the specific value of damage a community is willing to assume.

Risk is based on quantifying the damage expected to occur from a specific hazard. It depends not only on the hazard, but also on the susceptibility and capacity of the affected to respond.

³ Paul C. Bell, Juan Pablo Sarmiento and Nelly Segura of the Office of Foreign Disaster Assistance (USAID/OFDA-LAC), prepared this chapter.

⁴ Sarmiento, J.P., 1999.

The equation $R = f(A, V)$ means that risk is a function of the hazard and the level of vulnerability, and is directly proportional to both of these factors. In order to prepare an accurate risk estimate, it is necessary to analyze both the hazard and the level of vulnerability.

Risk and Disasters

Disasters are the manifestation of existing risk conditions. Risk conditions depend on the occurrence of intense events or phenomena and on the level of vulnerability. The level of vulnerability, in turn, determines the degree to which natural phenomena will become disasters. Vulnerability in its various forms is a development deficit and a negative environmental account towards which development planning efforts should be addressed. The vulnerability of human settlements is closely linked to the social processes within a community and its fragility, susceptibility, and lack of resilience to hazards. Environmental degradation, poverty and the occurrence of disasters, then, are intimately linked. Disasters are environmental events that result from social risk building, or increased vulnerability or hazards, or a combination of the two.⁵

The “disaster” concept refers to severe and exceptional situations that affect the life, health, goods and habitat of human populations (and in some cases of animal and plant stocks) beyond the self-help and resistance thresholds of the systems involved. The concept is not limited to the event itself; it also includes those affected by the event and their intrinsic weaknesses, propensity or “sensitivity” to the hazard that will emerge during a major negative event (vulnerability); and especially, their capacity to face the event (resiliency) and repair and reconstruct the damage. Thus, a disaster signifies a negative collective situation that arises from the conjunction of super-human forces (of natural or anthropogenic origin) and conditions of vulnerability.

It should be noted that these situations go beyond the individual sphere, although they are comprised of many personal calamities. From the systemic point of view, in order for there to be a disaster, the disturbance must affect the cohesion and functionality of a system, either in whole or in part. Disaster, from this standpoint, is synonymous with entropy. In common terms, it signifies a break in the established order.⁶

A disaster can have direct, indirect and secondary effects.⁷ Direct effects impact immobile assets and stocks (finished and in-process goods), and are represented by the total or partial destruction of physical infrastructure, buildings, equipment, means of transportation and storage, crop lands, irrigation work, and reservoirs, etc. Indirect effects refer to the damage to production capacity and social and economic infrastructure caused by the direct effects in the period between the occurrence of the event and the partial or total recovery of production capacity. Examples include loss of future crops, production losses due to a lack of raw materials, uncollected taxes, higher transportation costs, and the additional costs of facing new situations caused by the emergency or disaster. Occasionally, the reverse

⁵ Cardona, O.D., 2002.

⁶ Cardona, O. D., 2002.

⁷ ECLAC, 1991.

situation may occur, whereby new economic opportunities arise, which should be deducted from damage estimates. Finally, secondary effects are manifested in the impact of the disaster on principle macroeconomic variables; therefore, they reflect the repercussions of direct and indirect damages without including them. Examples include the impact on the growth rate of the global and sectoral gross domestic product, the trade balance (changes in exports, tourism, cross-entry of imports, payment for external services), and changes in the debt level, monetary reserves, public finances, and gross investment. It may even be necessary to estimate secondary effects on the inflation process, employment level and family income.⁸

The occurrence of a disaster, or of damages and losses in general, presupposes the prior existence of predetermined “risk” conditions. A society’s level of risk relates to its level of development and capacity to modify its potential risk factors. In this regard, disasters are mismanaged risks. All risks are socially constructed, even if the associated physical event is of a natural origin.⁹

The Scope of Risk Management

Within the field of risk management, it has gradually become accepted that risk itself is the essential problem and disasters are the byproduct. Risk and risk factors have become the fundamental concepts in the study and practice of disaster management. This paradigm shift has been accompanied by a growing emphasis on the relationship of risk and disasters to development planning and processes and therefore, with environmental issues and sustainable development. Risks and disasters are now seen as components of development and not as autonomous conditions generated by forces external to society.¹⁰

Risk management is understood as the efficient planning, organization, direction and control process aimed at risk analysis and reduction, disaster management, and post-disaster recovery.

Risk analysis¹¹

Risk analysis has been transformed from a simple function to an essential area of risk management. The systematic use of available information allows risk management organizations to determine the probability of certain adverse events and the magnitude of their consequences.

Risk analysis includes:

- Identifying the nature, extent, intensity and magnitude of the hazard
- Determining the existence and degree of vulnerability

⁸ Sarmiento, J.P. in Pan American Health Organization, 2000.

⁹ Cardona, O. D., 2002.

¹⁰ Cardona, O. D., 2002.

¹¹ “De donde venimos y hacia donde vamos, una perspectiva de 30 años sobre el tema de desastres en las Américas”, Bell, Paul C.; Sarmiento P. Juan Pablo; Olson, Richard Stuart. Draft, August, 2002.

- Identifying the measures and resources available
- Constructing probable risk scenarios
- Determining acceptable risk levels as well as cost-benefit considerations
- Establishing priorities regarding time and movement of resources
- Designing effective and appropriate management systems for implementation and control of these processes.

The inputs generated from risk analysis are fundamental to all other components of risk management.

Risk reduction

Risk reduction is the newest, and still evolving, area of risk management aimed at risk elimination or reduction. Significant progress has been made in the area of risk reduction, though it has been subject to limitations. One of its greatest problems is the sector (compartmentalized) approach assumed by most risk management organizations. Approaches towards risk management have been fragmented, rather than comprehensive, and overly dependent on the view of the specific discipline involved in the assessment. This situation has resulted in numerous epistemological and methodological variations. These scattered efforts have not facilitated the work of decision makers, who require a comprehensive, inter-sectoral and multidisciplinary approach.¹²

Most organizations working in the field are education or research institutions such as universities, geology and hydro-meteorology institutes, and non-governmental organizations and foundations, supported by economic development or financing funds, fellow governments and multi- and bilateral organizations. Multilateral banks have recently begun to participate in this area, as they recognize the economic, political, environmental and social impact of disasters on development.

Disaster management and risk reduction are now being recognized as broad and complex issues that can no longer be left in the hands of a few specialists. Therefore, the trend is toward a proactive and comprehensive treatment. The old myth of response as the solution has been replaced by the focus on reducing risk, which involves multiple actors and institutions.

Two components of risk reduction can be clearly distinguished:

- **Prevention:** Actions aimed at eliminating risk, by preventing the event from occurring or preventing damage by avoiding or limiting the subject's exposure to the hazard. It is difficult to implement measures to totally neutralize risk, particularly if it originates from natural hazards such as hurricanes, earthquakes, volcanic eruptions and tsunamis. In general, preventive measures are highly costly and nonviable when analyzed within the context of the existing reality. An example of a preventive measure is the permanent relocation of houses, production centers and infrastructure located in hazardous areas (landslides, floods, volcanic eruptions, etc.). Undoubtedly, prevention

¹² Segura, N., 1995.

is of the utmost importance and can most benefit future development processes, such as expansion of a city or a change in land use. In these circumstances, the concept of prevention may be included as another variable in the decision-making criteria.

- **Mitigation:** A set of actions aimed at reducing the magnitude and effects of an event. Mitigation measures include instrumentation and research of potentially dangerous phenomena, identification of high risk areas, and preparation of natural resource management standards and building codes.

Disaster management

Disaster management is the area of risk management that forecasts the best way to handle the impact and effects of a disaster. It also encompasses the execution of actions necessary for a timely response, such as evacuation procedures, victim care, and reduction of property loss.

A decade ago, disaster-related activities focused predominantly in this area. Disaster management has enjoyed political support at the national level as well as from international organizations, and has attained an acceptable level of professionalism among first responder organizations. Impressive technological advances in recent years have no doubt benefited this component. Progress has been made in planning, project development, and implementation. There have been important achievements in the definition of guidelines, protocol and procedures, as well as in the design of simulation exercises. However, while some disciplines and organizations have made significant progress, others still lag behind.

Despite the progress made in disaster management, vulnerability levels in many areas have increased. This situation is complicated by the great losses resulting from disasters that create the need for new soft loans to cover reconstruction costs, which aggravates the already fragile financial situation of many affected countries.

Disaster management works hand-in-hand with risk reduction so that response capabilities are adequate to deal with disasters and reduce the level of damage. If this is done successfully, disasters are simple emergencies, rather than catastrophes; fewer lives, goods and services are lost; less resources are spent on recovery; and the affected population can quickly return to traditional living conditions.

Disaster management includes three components:

- **Preparedness:** A set of measures and actions aimed at reducing the loss of human life and other damages. Examples include the preparation of search and rescue and response plans as well as the definition of procedures or contingency plans. Tools used for disaster preparedness include: inventory of physical, human and financial resources, monitoring and surveillance of dangerous phenomena, personnel training for emergency work, and definition of evacuation routes and shelters.
- **Alert:** A state of formal declaration of the near or imminent occurrence of a disaster. Not only is a disaster warning issued, but guidelines for institutions and the population

are also announced. Timely alerts depend on the changing speed of the event, as some are slow-onset (tropical storms, droughts, etc.), and others appear suddenly (earthquakes, landslides, etc.); therefore it is not always possible to issue an alert. Remote sensors, precipitation register networks, satellite systems, etc. are examples of instruments utilized in this component.

- **Response:** Actions undertaken when facing an adverse event to save lives, reduce human suffering, and diminish property losses. It is the immediate reaction to provide timely assistance to a population undergoing a severe change to its life patterns resulting from the emergency. Examples include search and rescue, medical assistance, damage assessment, temporary shelter, and clothing and food supply.

Recovery

Finally, recovery includes all measures that initiate the reestablishment of normal living conditions of the community affected by a disaster. It involves two broad aspects: temporary measures to restore basic, short-term critical services, and long-term, permanent solutions to reinstate the normal living conditions of the affected population.

Much of the criticism of recovery management deals with certain practices to rebuild affected infrastructure and processes without consideration of the risk variables. Overlooking these considerations leads to “rebuilding the vulnerability” by creating a new risk scenario. Other criticisms include the lack of citizen participation in reconstruction processes, and the difficulty regarding the entities responsible for managing the recovery. Another issue has to do with the entities responsible for managing the recovery. There is an ample range of experiences and the options for dealing with recovery, and these differ noticeably from country to country. Entities range from ad-hoc commissions in charge of coordinating efforts with the ministries in charge of the different sectors (public works, agriculture, livestock, treasury, energy, telecommunications, etc.) to autonomous organizations formed because of a disaster to independently manage rehabilitation and reconstruction work.¹³

Despite these differences, there is a clear need for future design of comprehensive reconstruction and transformation plans that incorporate civil society, NGOs and the private sector, both in the planning as well as the implementation phases.

Based on recent experiences, some guiding principles for reconstruction efforts have been established and adopted, which recognize that each situation deserves specific analysis of existing conditions, idiosyncrasies, and capabilities of the affected population.

Two components can be clearly identified in this area:

- **Rehabilitation:** The transition period that begins during response to reestablish critical basic services in the short term. Gradual recovery of the affected services begins here as well as rehabilitation of the stricken area. Reestablishment of services is achieved

¹³ Segura, N., 1995.

through provisional or temporary measures that do not necessarily constitute the definitive repair of the affected system, as they only strive to restore short-term service.

- **Reconstruction:** The process of infrastructure repair, restoration of the production system, and resumption of the population's normal life pattern. This process generates the most opportunities to improve the development level that existed prior to the disaster. Medium- and long-term measures aim to create new employment sources, repair material damages, and incorporate and adopt prevention and mitigation measures.

Recovery offers the window of opportunity in which to surpass the pre-disaster level of development and include the incorporation and adoption of prevention and mitigation measures.

As discussed, there is a close link between the four areas – risk analysis, risk reduction, disaster management and recovery – and therefore, the implementation of one affects the others and the general development process of the population. Socioeconomic development is intimately related to all areas and components. Development can therefore positively influence risk management by creating appropriate conditions for risk reduction intervention, or it can generate harmful situations leading to greater vulnerability and increased risk. However, the development process itself may be compromised when existing risk conditions evolve into disaster situations.

DISASTER REDUCTION TRENDS IN THE AMERICAS¹⁴

Introduction

It is a paradox that, at a time when extraordinary efforts are made to increase the sophistication, safety, and comfort of our societies, at the same time our vulnerability to natural hazards is increasing.

Exposure to natural hazards is magnified by the high levels of social, economic, ecological and human vulnerability that exist throughout the hemisphere, although to a much lesser degree in most parts of Canada and the United States. Inadequate housing, poorly chosen sites and construction materials, weak local organizations, lack of social protection measures, inadequate access to education and health services—these and other unfavorable conditions are all associated with poverty or the unequal distribution of wealth and opportunity. Increasingly concentrated population centers, the migration of many people to live and work in high-risk areas, changing land use patterns, growing demands on natural resources and often fragile ecosystems, and climate changes all contribute to the likelihood of more frequent and possibly more intense natural, environmental, and technological disasters. Any sustained commitment to reducing risk must therefore be considered in the context of development processes and indicators of human well-being.

At the Third Summit of the Americas (Quebec City, 2001), the Heads of States declared:

“We commit to strengthening hemispheric cooperation and national capacities to develop a more integrated approach to the management of natural disasters. We will continue to implement policies that enhance our ability to prevent, mitigate and respond to the consequences of natural disasters. We agree to study measures to facilitate timely access to financial resources to address emergency needs.”

A major shift from traditional disaster management towards integrated risk and vulnerability reduction is taking place in the Americas. The recognition that disasters, social and economic development, and environmental protection are inextricably linked has led to more attention being paid to risk reduction. Nevertheless, this shift has yet not been institutionalized or put fully into practice.

This is also relevant in light of the ongoing review of accomplishments in the implementation of Agenda 21, adopted at the Earth Summit in Rio de Janeiro in 1992. The ten-year review concluded at the World Summit on Sustainable Development (WSSD) in Johannesburg, South Africa, held in September 2002. In October 2001, ministers of the environment and other high-level representatives of the Governments of Latin America and the Caribbean gathered in Rio de Janeiro for the Regional Preparatory Conference for the WSSD. At this conference, participants adopted the *Rio de Janeiro Platform for Action on the Road to Johannesburg 2002*, which stresses the need to promote disaster vulnerability

¹⁴ Sálvano Briceño of the Secretariat of the International Strategy for Disaster Reduction (ISDR) prepared this chapter.

reduction and a culture of risk awareness through education, improved information dissemination, and early warning systems.

Preparedness, specialized emergency response services, and civil protection will always be needed to respond to disasters. However, expenditures for disaster assistance contingencies, or even for the maintenance of specialized civil defence capabilities, can only be justified if at least similar amounts are invested in the protection of existing resources and the development of lasting capabilities that increase resilience to natural hazards. Many countries in the region are considering institutional changes that reflect the need for a response capacity that integrates vulnerability and risk reduction.

Shifting attention and resources to vulnerability and risk reduction is an ongoing task, as conditions continue to change, new generations emerge, and societies grow. It requires the lasting commitment of officials, professionals, and members of local communities, based on new forms of multidisciplinary and inter-sectoral collaboration and partnership. Institutional networks that can multiply valuable experiences, focus on specific needs, and share information widely with the public are the essential organizational tools for disaster reduction in the 21st century. The International Strategy for Disaster Reduction (ISDR) was adopted by the UN General Assembly to succeed the International Decade for Natural Disaster Reduction (IDNDR, 1990-1999) in order to pursue these objectives globally by providing a strategic framework for implementation by countries, regions, UN agencies and civil society. ISDR is now in the process of being consolidated on a more permanent basis within the UN, testifying to the greater commitment by the international community to respond to future challenges in this field.

One of the key tasks of the ISDR Secretariat is to carry out a periodic review of the global trends and challenges in disaster reduction. The first report on the subject was published in the first quarter of 2002. The sections that follow in this paper are based on the background information provided by countries, regional institutions (CEPREDENAC, CDERA, PREANDINO/CAF), United Nations organizations, other bodies and experts as a contribution to this world-wide review.

Regional players

Triggered by several major disasters in recent decades, and further motivated by the promotional efforts and networking carried out in the 1990s within the framework of the IDNDR, the hemisphere has developed a relatively advanced understanding of risk reduction, resulting from social research, the widespread sharing of practical experiences, and more frequent opportunities for participation by an expanding range of professional interests. These concepts or approaches, however, are not always shared by those authorities officially designated to handle disaster management and response activities.

The presence and sustained support by a number of international or bilateral agencies, governmental or non-governmental, has facilitated a broader commitment to the development of institutional capacity in order to improve our understanding and practice of disaster risk reduction, with emphasis both on building preparedness capacities and longer-term resilience. The mutually reinforcing interdisciplinary efforts by such agencies as the

Pan American Health Organization (PAHO/WHO), the International Federation of Red Cross and Red Crescent Societies (IFRC), the Office of U.S. Foreign Disaster Assistance of the U.S. Agency for International Development (USAID/OFDA), and more recently by the United Nations Development Program (UNDP) and UNICEF, have proven crucial, by providing technical cooperation, training and awareness raising. Other organizations, such as the Organization of American States (OAS), the Network for the Social Study of Disaster Prevention in Latin America (LA RED), and many NGOs and several academic initiatives, have encouraged changes in outlook and the development of new understanding and capabilities towards vulnerability reduction.

More recently, the relationship between environmental degradation or mismanagement and hazard incidence has been increasingly emphasized by such institutions as the United Nations Environment Program (UNEP) and its Caribbean Environment Program (CEP), the Central American Commission for Environment and Development (CCAD), the International Conservation Union (IUCN), the Inter-American Development Bank (IADB), the Corporacion Andina de Fomento (CAF), the Caribbean Development Bank and the World Bank.

Climatic variability, meanwhile, has prompted the World Meteorological Organization (WMO) and others to go beyond scientific and technical research in order to take advantage of the available information to establish early warning systems and strengthen risk reduction at the institutional level. In this area, organized by the U.S. National Oceanographic and Atmospheric Administration (NOAA), the Climate Outlook Forum has brought together meteorologists, forecasters, and disaster managers in an attempt to integrate the use of weather forecast data into disaster management, agriculture, and health in the various sub-regions.

The importance of widespread access to information, thanks to its rapid and easy processing and dissemination, is fundamental to the effective promotion of risk reduction, both analytically and practically. The volume of information available electronically through the websites of many risk -and disaster-related institutions is growing more and more, especially in Latin America and the Caribbean. The most comprehensive source is the Regional Disaster Information Centre (CRID), based in Costa Rica, which has been an initiative of PAHO since 1990. CRID is supported by many organizations¹⁵ and is currently sponsored primarily by PAHO and the ISDR Secretariat. This Centre offers information and documentation online, as well as for direct consultation at its offices, on a wide range of subjects in both Spanish and English. Many other valuable disaster-reduction information resources have been developed in the region; most are available from the CRID web site, and some are referred to in these pages. PAHO also pioneered the extensive use of the Internet in the last decade to disseminate information and provide training, showing the way to most of the key players in disaster reduction in the region.

The Economic Commission for Latin America and the Caribbean (ECLAC) is working with several other UN agencies on improving a socio-economic damage assessment

¹⁵ PAHO, ISDR, CNE/Costa Rica, International Federation of Red Cross and Red Crescent Societies, CEPREDENAC and the regional emergency office of MSF.

methodology to promote investment in risk reduction during the recovery phases in Latin America and the Caribbean.

The themes of concern to many Multilateral UN Environmental Conventions are of great importance in the region, even though seldom connected to the traditional “disaster reduction” community. This is the case with the problems of drought and desertification, biodiversity, wet lands and global climatic change. Essentially, these concerns take us back to the issue of risk and disasters, and the synergy between them is of growing concern in the region. Potential changes in rainfall patterns, increased hurricane incidence and strength, loss of ecological resilience and natural ecosystem protection, rising sea levels, coastal degradation and loss of mangrove swamps presage new risk conditions in the future, and the need for new adaptive, mitigation and prevention strategies, implemented on an incremental basis.

Snapshot of Recent Major Disasters in the Americas

Hurricanes

First Georges, then Mitch (1998), accompanied by extraordinarily heavy rainfall, damaged 70 per cent of the infrastructure in Nicaragua and Honduras and devastated the economies of all countries in Central America, from which they have yet to fully recover. Coming on the heels of the socio-economic and developmental costs of El Niño in 1997, these hurricanes woke up international financial institutions such as the World Bank and the Inter-American Development Bank to the importance of natural disasters. In November 2001, Hurricane Michelle swept across the Caribbean, in particular Cuba, and the losses would have been greater had many people not been evacuated in advance.

Climate change

The successive El Niño and La Niña events of 1997 and 1998 were the most severe occurrences of these cyclical climatic phenomena in the entire 20th century. Deviations from normal weather patterns caused acute economic losses throughout the hemisphere, and indeed the rest of the world, in fields such as agriculture, fisheries, even tourism. These events also caused extensive flooding in some areas, extended drought conditions in others, and widespread wildfires.

Floods

In Mexico, the floods in 1998 were the worst since 1600, making almost 300,000 people homeless. Canada and the United States have also experienced record floods in recent years, prompting a rethinking of previously accepted procedures for civil and agricultural protection and of the value of structural barriers.

Landslides and mudslides

In 1998, the extraordinarily heavy rainfall brought about by Hurricane Mitch caused a landslide down Casita Volcano in Nicaragua that was 18 km long and three km wide,

destroying three towns and killing more than 2,000 people. In 1999, torrential rains in Venezuela triggered a landslide that caused more than 20,000 deaths. The unstable slopes that caused the landslide had been described by analysts as “a disaster waiting to happen.” Early in 2001, the first of two strong earthquakes in El Salvador caused a landslide on a slope destabilized by deforestation and slope mining, burying almost 500 people living in ill-placed and badly constructed communities, at least in part due to the lax enforcement of building regulations.

Earthquakes

In the past three years, severe earthquakes have hit Peru (most recently in June 2001, with a magnitude of 6.9-7.9 on the Richter scale), Colombia (in January 1999, with losses totaling almost 17% of the total value of Colombian exports in 1998), and El Salvador, shaking the complacency of officials and uncovering criminally casual building practices. El Salvador was hit by two earthquakes in one month. One of them, which was on the Richter scale, was the second most severe in 90 years.

Drought

Drought in the better part of Central America in 2001 has eroded the already fragile livelihoods of thousands of rural inhabitants. Drought conditions in North America during recent years have been some of the most persistent and severe this century. The El Niño phenomenon has also hit Bolivia with severe drought.

Wildfires, atmospheric haze

The combination of climate change and drought has triggered devastating wildfires in Central and North America, reaching far beyond the disaster areas in the form of air pollution.

In addition to the major disasters mentioned above, the losses from and social impact of a large number of small- and medium-scale events (landslides, flood, fire, etc.) in especially vulnerable areas are generally unrecorded, even though they have severely affected people’s livelihoods in local communities.

Figures Relating to Vulnerability

From 1990 to 1999, absolute poverty in Latin America and the Caribbean grew from 200 million to 225 million people. The highest-income 20 per cent of households earns 20 times as much as the lowest 20 percent, making the region the world leader in income inequality.

The region has the highest level of biodiversity in the world. However, these global resources are under serious pressure. Each year, 6 million hectares of tropical forest are lost. Coastal and marine ecosystems, including coral reefs in the Caribbean, are under threat from tourism and pollution. Climate change is likely to be the most serious of all threats to the natural environment of the region.

Demographic trends have led to the growth of large urban areas. The region has two of the largest mega-cities in the world, Mexico City and Sao Paulo. Seventy-five percent of the population of Mexico is urban, as is 50% of Central America's, with 65% of the poor living in cities. Population growth has been chaotic, with inappropriate areas being used for human settlements, aggravating vulnerability. Only 40% of solid waste is appropriately managed.

Poor land-use management has led to the degradation of 65 million hectares of soil and the endangerment of thousands of species.

New studies by the Intergovernmental Panel on Climate Change (IPCC) underscore the likelihood in the 21st century of greater and more frequent hydro-meteorological disasters as a result of climate change. Scenarios include more coastal flooding and damage to infrastructure as a result of higher sea levels; an increase in atmospheric and sea temperatures leading to greater droughts; extreme heat waves and forest fires; more intense tropical storms and rainfall leading to more floods, landslides and avalanches; and an intensification of all the phenomena related to El Niño and La Niña¹⁶. The IPCC expects that in 60 years, 25% of all housing within 1.5 km of beaches might be lost to coastal erosion.

Activities, Accomplishments, and Future Trends and Challenges

Andean countries

Activities and accomplishments

The Andean countries—Bolivia, Colombia, Ecuador, Peru and Venezuela— represent a sub-region highly exposed to a large variety and frequency of hazards: earthquakes, volcanic eruptions, floods, landslides, avalanches, droughts and forest fires, not to mention technological hazards. In the last few years alone, reference can be made to the torrential mudflows that hit Venezuela in December 1999, affecting more than 10,000 people and causing US\$3 billion dollars in losses; the eruptions of Guagua Pichincha and Tungurahua volcanoes in Ecuador in July 2000 and June 2001; and the June 2001 earthquake that hit southern Peru with a magnitude of 8.4 on the Richter scale—the most severe worldwide in the past 25 years. Although the loss of lives was relatively low, the disaster affected over 213,000 people, destroyed or damaged 80,000 housing units, and ravaged 2,000 hectares of crops.

However, it was the singularly violent El Niño phenomenon of 1997-1998 that most severely affected the Andean countries, causing economic losses estimated at US\$7.5 billion and costing the individual countries between 4.5% and 14.6% of their Gross National Product. The severity of this event motivated the heads of government of these nations to ask the Corporación Andina de Fomento (CAF) to establish, in late 2000, the Regional Program for Risk Prevention and Reduction (PREANDINO). The objective of

¹⁶ Abramovitz, J. N., 2001

the PREANDINO was to promote and support the development of national and sectoral risk prevention and mitigation policies, and the establishment of new institutions that would incorporate prevention into development planning.

At the operational level, the key players in this initiative are the National Committees, which include representatives from the ministries of Planning, Science and Technology, and the Environment, as well as of national civil defence or disaster prevention and response bodies. Sectoral Committees have also been appointed. All these institutions are linked in a network that, supported by face-to-face conferences, facilitates the exchange of information and experience, allows participants to share and shape indicators on the effectiveness of disaster management, and simplifies negotiations with financial bodies.

At the national level, Colombia was a pioneer in the region in setting up a systematic approach to integrated disaster management, following the eruption and mudflow of Nevado de Ruiz in 1985. The National Disaster Prevention and Response System (SNPAD) has since been developed. Bolivia has new legislation that established an institutional framework for risk prevention. At present, Bolivia is harmonizing its Environment Act and regulations with the Risk Reduction and Disaster Response Act so as to have a unified vision of the planning process for achieving sustainable development. At the same time, it is producing new building regulations to mitigate the impact of earthquakes and incorporate risk reduction into the National Public Investment System.

In the other countries, progress has not been as extensive, although some strides have been made. Ecuador, for instance, is reviewing proposals for the establishment of a National Disaster Prevention and Response System. With the support of PREANDINO, Venezuela is drafting a new Civil Protection Bill that would incorporate risk management, and the current laws on land-use management, urban development and planning are being revised.

Not all Andean countries have the financial resources needed for preventive risk management. Within the PREANDINO framework, opportunities are being sought to establish special prevention funds and make better use of existing sources of financing. In the case of Ecuador, a Risk Prevention and Management Fund is being created with the support of international financial institutions.

In order for disaster prevention to be a key component of sustainable development initiatives, efforts are underway in the Andean countries to incorporate it into national and local development plans and land-use management plans, as well as to establish support mechanisms for planning and decision-making.

Several initiatives are also underway to institutionalize information and impact assessment systems and performance indicators to encourage greater follow-up of institutional actions and facilitate planning. The most relevant of these initiatives is the design of socio-economic indicators to measure the likely impact of natural hazards on the various regions of each country to contribute to preventive planning. This initiative has already been tested in Venezuela. The development of another set of indicators to assess risk reduction trends is also underway, as part of the monitoring tool being developed jointly with ISDR and PREANDINO.

The promotion of a culture of prevention requires the involvement of the school system. In Bolivia, efforts are underway to include risk management as a cross-cutting subject in the primary and secondary school curricula; at the university level, an administrative resolution has called for the inclusion of risk management as an elective course in all relevant disciplines, and for the establishment of risk management as a technical discipline. Colombia is moving ahead with the design and funding of a strategy to develop a higher education policy on risk prevention; through SNPAD, a National Commission on Disaster Prevention Education is being created to help define a national policy in this area. In Venezuela, a process already underway in the education sector is being strengthened to include disaster prevention in school curricula as well as in the design and construction of school infrastructure.

Some universities offer master's degrees and other postgraduate options in risk management. The School of Public Education at Colombia's University of Antioquia hosts a PAHO/WHO Collaborating Centre and also offers a master's degree in social sciences and risk management. The University del Valle in Bogota also offers an integrated risk management postgraduate program. Venezuela's Instituto de Tecnología de Ejido (IUTE) offers a technical degree in Emergency Management and Disaster Response.

Research and the use of technology for disaster reduction has also progressed in this sub-region, including the compilation and systematization of the information available on hazards, vulnerabilities and risks, and the establishment of Knowledge Committees that share information and experiences. In Peru, for instance, risk maps are being drawn and efforts are underway to standardize the mapping methodology. Bolivia is also developing risk maps, as well as a methodological guide to designing a National Risk Prevention and Mitigation Plan and Sectoral Plans as part of the National Planning System. Ecuador has carried out a significant compilation of data on hazards and risks. The Ministry of the Environment is also working on man-made and technological hazards, employing the GIS of the Environmental Information Centre. Venezuela is also advancing in the systematization of data and the product of seismic risk maps. Many of these initiatives have benefited from the support of the UNDP.

An outstanding example of this trend has been the establishment, with the support of the WMO, of the International El Niño Research Centre, based in the city of Guayaquil, Ecuador. This initiative enjoys the support of the G-77 group of developing nations.

Vulnerability studies and initiatives to refit health facilities and sanitation systems have been carried out in several of the countries, in particular in Colombia, Ecuador and Peru, prompted by PAHO. CISMID, based in Peru, continues to provide specialization in this area to engineers and related disciplines.

Andean regional efforts have also heeded the mechanisms promoted by the United Nations International Strategy for Disaster Reduction (UN/ISDR). At present, steps are being taken to ensure that national institutions' disaster reduction platforms act as focal points for ISDR, in particular to improve information exchange, policy coherence and interaction processes.

Future challenges

While automated monitoring networks, risk mapping, zoning and institutional strengthening are common among Andean countries, vulnerability assessments are not as frequent. The need for them is evident.

It has also proven difficult to make sure that the findings of the various research projects and the conclusions of a variety of meetings on the subject of disaster reduction materialize as concrete activities.

Another significant limitation has been the lack of a true land-use management strategy that takes into account the risks of placing human settlements, critical infrastructure, health or educational facilities and industrial or commercial buildings in sites vulnerable to natural or man-made disasters.

The “to do” list also includes the integration of the efforts to date in disaster reduction into development plans and programs. This is perhaps the largest hurdle to instilling a true culture of prevention. Much as the connection between the natural environment and sustainable development was not formally established until the Rio Earth Summit of 1992, which raised awareness that ecosystems are not a cornucopia of renewable resources and human beings cannot stand apart from their physical environment. It is vital today in the Andean countries—although not only there—to realize that sustainability can only be achieved by reducing our vulnerability to natural and man-made disasters.

Caribbean States

Activities and accomplishments

In addition to sharing many social and cultural traditions, Caribbean countries also share the same natural hazards. All of the countries are vulnerable to hurricanes; most of the islands are susceptible to earthquakes; and many of them have active volcanoes. Landslides related to intense rain or ground motions are also common. Environmental degradation associated with tourism, mining, and agriculture aggravates the impact of these natural phenomena and puts these and other economic activities at risk.

During the International Decade for Natural Disaster Reduction (IDNDR), participants from multiple disciplines discussed risk management, in recognition of the vital need for collaboration among disaster managers, scientists, engineers, environmentalists, development planners, meteorologists, and legislators. The UNDP, the University of the West Indies (UWI), the Caribbean Disaster Emergency Response Agency (CDERA), and the Office of U.S. Foreign Disaster Assistance of the United States Agency for International Development (USAID/OFDA) have all co-hosted biennial conferences on disasters. Many other interdisciplinary meetings have contributed to the construction of a regional agenda.

Disaster reduction has been introduced as a policy concept into most regional initiatives, in particular in the Program of Action for Small Island Developing States (POA-SIDS) and the Caribbean Community (CARICOM). It is also a priority area among the programs of the Association of Caribbean States (ACS). The issue of vulnerability assessment has been raised as a key foreign policy interest of the Caribbean Community in several forums of the World Bank, the IADB, the OAS, PAHO, and the Commonwealth Secretariat. Moreover, the Conference of Heads of Government of the Caribbean Community (COHG), the highest level decision-making body in the region, has agreed that the environmental and disaster management portfolio should be a Cabinet-level position.

All countries in the area have national disaster committees composed of public and private bodies and NGOs, which provides a basis for institutional networking. However, although most of them have a designated national disaster coordinator and emergency operations facilities, and conduct periodic public information campaigns, the focus remains on disaster preparedness and response capabilities. Risk maps and contingency plans abound, but they are often out of date. With some exceptions, the Caribbean has not managed to mainstream risk-assessment and disaster-reduction practices. There is a need for more suitable disaster legislation and comprehensive disaster reduction policies.

At the national level, good working relationships with regional and international agencies have resulted in the development of bilateral programs related to at least some aspects of disaster management. Linkages with the international scientific and technical community generally take place through educational institutions and professional societies. Regional efforts date back to 1991, when CARICOM countries committed themselves to the establishment of a permanent agency that would be focused on disaster preparedness and response planning. The Caribbean Disaster Emergency Response Agency (CDERA) has made it possible for a planned approach to the development of disaster management programs to be adopted, including training, national and community-level capacity building, and the development of multi-island projects. As a result, several countries have made significant progress in advancing disaster management at the national level, while elsewhere achievements have been more modest. At the very least, all member states now have some basic capability for disaster management, although mainly in the fields of disaster preparedness and response.

CDERA and other international organizations have been working to broaden the disaster management agenda, but much remains to be done. One such recent initiative was the 2000 agreement sponsored by the ACS to improve disaster management cooperation among all Caribbean Basin countries, including those in Central America and northern South America. The agreement has been explicitly supported by CDERA and the Coordination Centre for Natural Disaster Prevention in Central America (CEPREDENAC). USAID/OFDA provided funding for the recently concluded Caribbean Disaster Mitigation Project. The OAS has been executing the Caribbean Planning for Adaptation to Climate Change Project, which helps countries to cope with the damage caused by global climate change to coastal and marine areas by means of improved vulnerability assessment, adaptation planning, and related capacity building.

As in the rest of Latin America and the Caribbean, PAHO has been working on promoting hospital mitigation and the use of the SUMA Integrated Humanitarian Supply Management System. Most Caribbean countries already have a Health Disaster Coordinator, although many of them can only work part-time due to human resource limitations in most Ministries of Health, particularly in the smaller islands. By comparison, some countries have institutionalized their health and disaster program, and have implemented systems to respond to natural disasters and other, more everyday, emergencies. Vulnerability surveys have been conducted in many referral hospitals in the English- and Dutch-speaking islands, and retrofitting measures have been implemented in four of them with assistance from bilateral donors and the European Commission's Humanitarian Office (DIPECHO), which focuses on multi-country projects as well as community-based disaster programs. PAHO has also worked together with CDERA and the International Federation of Red Cross and Red Crescent Societies to build capacity in school preparedness, emergency telecommunications, media policy, and the establishment of flood early warning systems.

UNDP, together with other organizations, has supported risk mapping and community disaster preparedness and training projects. It has also played a leading role in building inter-agency dialogue among donors in the region. Useful and sometimes innovative programs have been implemented by financial institutions. The Caribbean Development Bank (CDB) has a disaster management policy and has also adopted strategic and operational guidelines for assessing natural disaster management programs. These initiatives seek to assist member countries in developing disaster management capabilities while they make sure that disaster management principles are integrated into CDB's operations. With OFDA's support, the Bank is in the process of establishing a disaster management facility. It has also been a major player in retrofitting school facilities.

As part of a comprehensive action plan for disaster risk reduction in Latin America and the Caribbean, the IADB is developing several proposals for technical cooperation in the field of climate change. The World Bank is working through the Organization of Eastern Caribbean States (OECS) on a program that will offer loans to five countries in the region to support capacity building, institutional strengthening, community preparedness, and greater protection for key infrastructure.

In the private sector, United Insurance Company Limited offers a 25% discount to clients who have increased their properties' resistance to natural hazards. The company has also published and promoted two handbooks, *Professional Guide to Performance-based Design Upgrade: for Achieving Hurricane-Resistant Construction*, and *Guide to Making Your Home Hurricane-Resistant*.

Throughout the region, the general level of public awareness about hazards and natural disasters has been raised significantly. This is noticeable in the quality of the information provided by the media, the preparedness actions taken by communities, and the growing familiarity of schoolchildren with local hazards. However, the most potent stimulus to a positive change of behavior has been the recent experience of a disaster; complacency is still all too common in those countries that have not recently been hit by a disaster. This has led to the recognition that public information and education campaigns should focus on producing messages that are better aligned with the target audiences.

Forecasts provided by the Caribbean Institute for Meteorology and Hydrology, posted on its website, are currently used to make decisions on crop management and for water storage and distribution planning. Hurricane-tracking and warning systems based on satellite observations and modeling, are used regularly by meteorological services throughout the region. The use of geographical information systems is growing, especially for hazard mapping, and its potential for multi-disciplinary approaches to planning and integrating risk management into development planning is considerable.

Integrating disaster management into the sustainable development process is the goal of a CDERA program, in partnership with the UNDP and USAID, involving a wide cross-section of participants drawn from community, national, and regional levels. The development of community capacity is one way of reducing dependence on centralized systems; with this in mind, information and training materials have been produced, NGOs have been trained, and the design of new strategies has been encouraged. World Bank initiatives include support for community programs, and DIPECHO has promoted initiatives at the regional and national level. CDERA has defined a multi-hazard and multi-sectoral strategy for Comprehensive Disaster Management (CDM) that over the next five to seven years should integrate vulnerability assessment and risk reduction into development planning and management. The major link between environmental and development strategies at the regional level can be found in the Small Island Developing States Program of Action (SIDS POA); its implementation has started in many countries with the inclusion of disaster management agencies in national Sustainable Development Councils. However, significant limitations remain, such as the lack of financial incentives.

The University of the West Indies includes several disaster-management topics in its Bachelor and Master's degree programs, while the University of Technology in Jamaica incorporates such components into its curriculum for architects, builders, and planners. At the main library of the University of the West Indies, DIPECHO has established the Caribbean Disaster Information Network (CARDIN), an information and reference centre on natural disasters that maintains close links with Latin America's Regional Disaster Information Centre (CRID), and will soon release a CD-ROM "virtual disaster library". Once it is fully functional, CARDIN's website will provide full-text documents to the public; it should also facilitate communications among the various disaster management organizations in the Caribbean—not to mention its potential impact on education.

Future challenges

Although some assessments have taken place on the progress of risk management in the Caribbean, such as those by the Caribbean Disaster Mitigation Project (CDMP) in 1999, the UK Department for International Development (DFID) in 2000, and DIPECHO in 2001, there is a clear need for mechanisms that can provide regular assessment of the impact and outcomes of disaster management activities.

For such management to become more comprehensive, it will be necessary to develop more human resources, disseminate information more effectively, and strengthen institutional capacities and change management. Multi-island integrated approaches should also be

expanded, particularly those aimed at developing flood management capabilities, conducting vulnerability and risk assessment, and protecting critical infrastructure. This will call for the development of more standardized and ambitious regional benchmarks, including goal setting and monitoring by national disaster organizations. These organizations need to establish minimum staffing levels and hire professionals from a variety of disciplines to ensure a more comprehensive approach to risk management.

Although there is awareness in the Caribbean of the link between disasters and development, it is not yet reflected in the planning of key economic activities in order to reduce vulnerability reduction in key sectors such as agriculture, tourism, and fisheries.

Although progress has been made in preparedness and response, the approach to risk reduction embodied by Comprehensive Disaster Management must continue to be strengthened.

Central America

Activities and accomplishments

Central America is a geographical and geopolitical region with deep-seated physical and historical roots and a component of the Caribbean Basin which enhances close links with the Hispanic countries of the Caribbean, particularly the Dominican Republic. The establishment of the Central American Common Market in the 1960s, its demise under the stresses of economic crisis and civil war, and the renewal of ideas on regional integration with the creation of the Central American Integration System-SICA- in 1991, are indicators of the search for a common future. The increasing participation of Panama and Belize in this system is a sign of the need for integration between contiguous countries. And, with the advent of the global economy, the development of the so-called Central American Logistical Corridor, Plan Puebla-Panama, and the Central American Biological Corridors, along with other regional initiatives, the region moves towards becoming, more and more, a consolidated and integrated economic, social and political unit.

Central America also shows a relatively high level of unity in terms of the disaster problematic and the particular manifestations of environmental risk that are present. All of the countries are prone to varying levels of seismic activity, to flooding, drought, landslides and damaging coastal erosion processes. Volcanic activity is most prevalent in El Salvador, Guatemala, Nicaragua and Costa Rica. Located in the Caribbean hurricane belt, all of the countries are exposed to the direct or indirect threats associated with these seasonal phenomena. These naturally occurring hazards are complimented with pseudo or socio-natural phenomena associated with processes of environmental degradation and land mismanagement.

Over the last three years, Central America has witnessed important changes in the organizational and institutional approach to risk and disaster management. The successive impacts of El Niño, Hurricane Mitch, La Niña and the El Salvador earthquakes, between 1997 and 2001, had a profound impact on the way disasters are now conceptualized in Central America. Prior to 1998, the institutional and societal mindset concentrated almost

exclusively on disaster preparedness and response. This has changed significantly since then, as reflected by the fact that references to risk and risk management have increasingly replaced those related to disasters and disaster management.

The governments of Central America have shown a readiness to proceed jointly towards a common goal, sharing their resources and reinforcing each others' strengths. This has been reflected, in policy terms, in their endorsement of a Strategic Framework for the Reduction of Vulnerability and Disasters in Central America, and the adoption of a Five-Year Plan for the Reduction of Vulnerability and the Impact of Disasters (1999-2004). The Strategic Framework identifies six major working areas: strengthening national disaster organizations; early warning systems and strategic plans; increased research on hazards and vulnerability and the promotion of information sharing; sectoral risk reduction strategies; mutual assistance in the event of a disaster; and local-level risk management. Realizing the importance of cementing a shared vision of natural hazards, and of the benefits to be gained by developing joint institutionalized approaches to their reduction, did not happen overnight. In fact, it took the devastating consequences of a succession of disasters over three years.

In practically all Central American countries, including recent CEPREDENAC members Belize and the Dominican Republic, recent advances in institutional capacity-building and policy development incorporate an inter-sectoral and interdisciplinary approach to risk management. Costa Rica has passed new laws in this field, and is currently working out the operational details. In Nicaragua, which decided to launch its national risk-reduction program as a result of the impact of Hurricane Mitch, UNDP support has led to new legislation that creates a National Prevention System.

Guatemala reformed its disaster legislation in 1996, creating the National Disaster Reduction Commission (CONRED), which, together with the Department of Planning, is currently establishing a National Risk Reduction System and incorporating these issues into the National Poverty Reduction Plan. The Dominican Republic and El Salvador have received IADB backing to review and reform their current mechanisms to incorporate natural, environmental and man-made risk management and disaster reduction. The national focal point for disaster reduction in Honduras, COPECO, obtained a certificate of distinction from the UN Sasakawa Award for Disaster Prevention for its outstanding awareness-raising activities.

An important role in this regard has been played by CEPREDENAC, the Coordinating Centre for the Prevention of Natural Disasters in Central America. Starting out in 1988 as an informal group of scientific and disaster response organizations sponsored by Sweden, in ten years it has become the official Central American Integration System's specialized organization for risk and disaster reduction. After the logistical and operational demands imposed by the devastating disasters of the late 1990s, it has proven to be a keystone in tying together many professional abilities and multiple regional political interests.

The Regional Strategy had called for an update of CEPREDENAC's Regional Plan for Disaster Reduction, including national and sectoral annexes. This update has served as the vehicle since 1999 for CEPREDENAC to promote the main lines of action identified

jointly by governments and many other stakeholders throughout the region. CEPREDENAC's visibility, pertinence and political status have all grown accordingly, facilitated by international support for the region to pursue risk reduction strategies and actions.

Today, CEPREDENAC is viewed as a key player by many agencies, particularly given the resurgence of interest in regional endeavors. Within SICA itself, CEPREDENAC has gained status through its relationships with other specialized sectoral agencies. It has engaged in collaboration with PAHO in the health sector, with the Housing and Human Settlements Coordinating Committee in the housing and human settlements area, with the World Food Program (WFP) and the Central American and Panamanian Institute for Nutrition in food security matters; with the Central American Transport Committee in matters related to communications and transport. It has also cooperated with other regional agencies in fields such as agriculture, water management, electricity generation and distribution, and telecommunications. Valuable links have been forged with community organizations such as the Community Network for Risk Management, the Federation of Community Organizations, and the Central American Municipal Federation.

Over the past three years, CEPREDENAC has moved increasingly away from individual project management activities towards the development of broader regional programs, encouraging the implementation of strictly national projects by national authorities or local groups. Recently, CEPREDENAC and the Regional Unit for Technical Assistance (RUTA) published guidelines for the introduction of risk management practices in rural development projects throughout the region. RUTA is a UNDP project administered by the World Bank in liaison with other international and regional agencies to facilitate the coordination of financial and technical assistance to the region. In a similar vein, CEPREDENAC is now addressing the risks associated with the Puebla-Panama Logistical Corridor, establishing more partnerships with the private sector and the regional and international banking community, and promoting risk reduction across Central America's sectoral development agencies. Thanks to such actions, the governments of the region have established their commitment to risk reduction and reconstruction through social transformation.

However, challenges still remain in successfully moving from the expression of political good intentions toward fundamentally changed policies and practices. Enormous efforts will be required in many fields, including greater social awareness, legislative and institutional changes, modified social practices, a more effective struggle against corruption, and the mobilization of the private sector and commercial interest groups. The definitive change will only take place when society at large accepts the sacrifice of short-term gains in exchange for reaching medium- and long-term goals for the sustained protection of social and environmental resources, as well as economic assets.

A promising expansion has also taken place in the programs and projects aimed at reducing vulnerability to natural hazards at the local level, building national capacity, exchanging information and lessons learned at the regional level, and engaging program and investment partners at the international level. New and crucial linkages are being forged between environmental and risk-reduction interests, as greater attention is paid to the use of

environmental management principles that can provide economic benefits locally while increasing the protection provided by the natural environment against hazards. The conservation of mangrove swamps, controls over forest resources, the preservation of biodiversity and the promotion of ecological resilience are all new options for increasing ecosystem productivity and reducing the impact of natural hazards.

CEPREDENAC's website contains regularly updated information on risk reduction plans, programs and projects in the region, as well as disaster statistics and analysis. Each national disaster organization also has its own website, as do many other institutions working in the region in connection with disaster-reduction issues. These include the PAHO Emergency Preparedness and Disaster Relief Coordination Program (PED) and other PAHO/WHO initiatives, as well as various UNDP country programs. Among the latter, the information provided by the El Salvador country office is the most specific in terms of risk assessment.

PAHO has been working with the Central American countries, particularly after Hurricane Mitch, to promote institutional strengthening in the health sector with regard to disaster reduction, capacity building to assess vulnerability, and improving mitigation measures in health facilities and water and sanitation systems, all with a community development component.

There have also been a number of new developments in the increasing use of information technologies. The DESINVENTAR software¹⁷, which allows for the storage and recovery of statistical analysis and graphic presentation of information on all types of damaging events registered in the database, has become the official software of all national disaster organizations in the region, thanks to a CEPREDENAC-fostered agreement. It will soon be introduced into the Caribbean under the joint auspices of The Association of Caribbean States and CEPREDENAC. The use of geographical information systems for risk analysis has also increased, although it is far from widespread due to its cost, availability, technical demands, and continuing lack of locally tailored applications. Beyond its initial use at national government institutions and research centers, efforts continue to enhance this software to address more effectively the needs of local authorities and community organizations.

An important basis for increasing public awareness and understanding of more advanced conceptions of risk and disaster reduction must be a sustained commitment to engage the formal and informal educational systems. However, it is probably in this area that the smallest advances have been made in Central America over the past few years. In contrast to the 1990s, when some attention was paid to raising awareness and attempts were made to reform curricula in the field of disaster response, there has been less recent in addressing more complex risks and their links with broader developmental and environmental issues.

At the university level, many initiatives are currently underway. Among them, four universities are offering master's degrees in disaster management and risk reduction. One of them, Natural Disaster Mitigation in Central America, is coordinated by Costa Rica's

¹⁷ Designed by LA RED

National University with the participation of universities from all the Central American countries under the CSUCA umbrella. It has already secured basic funding for 12 years from the government of Sweden. It focuses on hazards (vulcanology, seismology, geotechnics, hydrometeorology, floods), although it does incorporate some integral risk management concepts. Another example is the National Autonomous University of Nicaragua, which offers a master's degree in the prevention and mitigation of natural disasters that emphasizes geo-science hazard topics and the use of information technology such as GIS and remote sensing systems. Significantly, the course goes beyond the study of hazards by offering courses on risk management, land-use management, and their links to sustainable development. In the case of the other universities, the focus remains on geo-sciences, engineering subjects, and the structural aspects of mitigation, or else on topics pertaining to operational preparedness and response capabilities. As useful as these may be in their respective contexts, little has been achieved so far in developing risk reduction curricula within social science faculties. This relative lack of educational opportunities in the social sciences contrasts starkly with the rapid increase in recent years of such perspectives in conceptual developments and practice on the ground.

Future challenges

Despite the accomplishments—the wide range of activities promoted in the region by governments, local organizations, NGOs and international agencies, working together with an expanding circle of actors—a number of problems remain that must be addressed to enable further progress in natural disaster reduction.

Few real options exist so far for professional education in risk management and development, particularly those that are multidisciplinary in focus or teach strategic planning. Despite the rapid increase in risk management initiatives in the region, and a substantial increase in the demand for professionals in this field, much remains to be done to provide enough trained people to take up the challenge. This is an area in which professional organizations and the private sector could stimulate the development of new opportunities.

At the local level, several factors limit the expansion of risk management. Ironically, the political trend towards decentralization, which also applies to official disaster management organizations, can severely limit the options for building national policies to promote local risk reduction practices that have a widespread impact throughout the region. Unmet needs also remain in the establishment of standardized, widely applicable, low-cost early warning systems. Despite the considerable experience to date in local risk management practices and practical methodologies, not enough efforts have been made to systematize this information and make it easily available to others.

The rapid increase in the number and scope of risk management projects in the region has not been accompanied by adequate levels of national and regional coordination and communication. The result has been that many organizations are doing similar things, often with inadequate knowledge of parallel or complementary activities. It is no less true that many internationally sponsored projects also suffer from this same problem.

It would be advantageous—and in the long term, probably more economical—to make a greater effort to ensure that international financial and cooperation agencies formulate their own projects with risk considerations in mind. The demonstration effect would also set a positive example for national authorities.

Southern Cone and Brazil

Activities and accomplishments

Although the Southern Cone countries—Argentina, Brazil, Chile, Paraguay, and Uruguay—are geographically and climatologically different, they are all beset by floods, landslides, drought, forest fires and technological hazards brought about by growing industrialization. On the Pacific side there are also seismic and volcanic hazards shared by Chile and, to a lesser extent, Argentina. The El Niño phenomenon is a recurrent event that affects the region severely, although it also has positive effects that should be taken advantage of.

Some countries have reinforced emergency plans and programs to such a degree that they can even provide support to their neighbors. This reflects the capacity and strengths to fight disasters that exist in the sub-region, even if there is no umbrella organization in this field.

In higher education, degree courses are being created in civil protection and disaster management in general. Other advances have taken place in natural hazard assessments, risk maps, and the production of literature and reference material.

Disaster management institutions have also become more adept at organization and planning. In most countries, ongoing and systematic efforts are underway to provide new legal, administrative and policy structures that can improve the effectiveness, timeliness and coordination of disaster reduction initiatives.

Greater emphasis is being placed on disaster prevention and mitigation. Investments in retrofitting critical infrastructure are increasing. Significant improvements have been made to early warning systems. Local-level organization for prevention and mitigation has been strengthened, particularly in fields such as training, education and information.

In Argentina, the floods of 1998 motivated the creation of the National Commission for the Recovery of Areas Affected by Climatic Emergencies (CONAREC). The success of this initiative led to the establishment of the Federal Emergency System (SIFEM), which was conceived as an organizational and liaison tool for national, provincial and municipal bodies to prevent disasters and improve emergency management.

SIFEM is under the oversight of a new body, the Cabinet Ministers' Emergency Board (GADE), which is headed by the country's Chief of Staff and includes cabinet-level representatives from the ministries of Internal and External Affairs, Defense, Economy and Services, the President's Office, the Department of Natural Resources and Sustainable Development and the Environmental Regulation Agency. This makes it possible for

disaster reduction to be handled not as an isolated affair, but as part of much broader sustainable development plans and policies.

A key component of SIFEM/GADE is the National Directorate of Security and Civil Protection Policies, part of the Department of Internal Security of the Ministry of Internal Affairs. It is the Directorate's responsibility to carry out those prevention and response activities needed to protect citizens from natural and man-made catastrophes. A new bill is being drafted to increase the Directorate's scope and powers.

In the field of higher education, Cuyo National University in Mendoza offers a postgraduate degree in Prevention, Planning and Integrated Management of Risk-Prone Areas.

Brazil's National Civil Defence System (SINDEC) integrates several bodies, and is managed by the National Civil Defence Department (SEDEC), part of the Ministry of National Integration. SEDEC's job is to coordinate civil protection actions throughout the country; its mission is to reduce disasters through prevention, preparedness, and response and reconstruction activities.

Civil Defence's intersectoral work is carried out at all levels, so as to achieve a multiplying effect and promote mutual assistance. SINDEC's top-level decision-making body is the National Civil Defence Council, which brings together high-level representatives from various ministries and federal agencies. At the regional level there is a Regional Civil Defence Coordinating Body (CORDEC); at the state level, a State Civil Defence Coordinating Body (CEDEC). At the municipal level, efforts are being made to have all local-level civil defence agencies be part of Municipal Civil Defence Coordinating Bodies (COMDEC) to improve disaster response in each municipality, reducing loss of lives and property.

Chile's National Emergency Bureau (ONEMI), part of the Ministry of the Interior, coordinates the National Civil Protection System. A technical agency of the Chilean government, its role is to implement all civil protection policies and initiatives.

At the institutional and participatory level, interdisciplinary and multi-sectoral partnerships with public and private bodies are encouraged. Methodology has been developed to implement Community Participation in Local Security Management Programs through a risk micro-zoning process, and resources have been provided to 100 communities throughout the country to establish their own Programs.

Alternating periods of drought and intense rainfall and flooding took place in 1997 and 2000, affecting housing and infrastructure. These damages and vulnerabilities have led to the development of a Master Plan for Rainwater Drainage that will be implemented in all cities with more than 50,000 inhabitants. An Early Warning Centre (CAT) monitors on an ongoing basis those natural or man-made phenomena that might trigger an emergency.

In the field of education and information, the first postgraduate course has been taught on journalism and emergency and disaster management in Chile. A National Civil Protection Information Centre is also being set up.

Since 1993, Paraguay has had a National Emergency Committee (CEN) within the Ministry of the Interior. The Minister is the head of the CEN Council, which also has representatives from the ministries of Social Affairs, Finance, and Services, the Armed Forces, the National Police Force, and several relief organizations. There are Emergency Committees at the State and local level.

Flooding is the most common adverse natural phenomenon in Paraguay. In 1997-98, 60,000 sq. km. were flooded, affecting agriculture, livestock production and infrastructure, and forcing the evacuation of over 15,000 families. With the support of the United Nations Department of Humanitarian Affairs (DHA), CEN and other national institutions have compiled disaster information available since the 19th Century, assessed the most serious hazards, and drawn risk maps of potential flood patterns. These institutions have also produced a National Contingency Plan and proposed the creation of a National Disaster Prevention and Response System. The country has received significant loans and other support from the international community for these efforts, including a US\$16 million loan from the World Bank.

Uruguay is one of the South American countries that is least vulnerable to natural and technological disasters. Even so, it has a National Emergency System overseen directly by the President of the Republic.

Future challenges

Thanks to monitoring networks and significant hazard and vulnerability assessments, there is at present a greater understanding of the natural hazards that affect the region. Preparedness measures have been taken, and there are legal and regulatory mechanisms in place. However, it is still difficult to implement land-use management policies that take natural hazards into account, particularly in densely populated areas.

A growing concern over man-made and technological emergencies reveals a need to gain greater knowledge of the vulnerabilities associated with technological risks. This is especially relevant for the trade corridors and transportation of hazardous material.

One of the greatest challenges, then, is to develop research programs that can help to reduce natural and man-made risks within the framework of a sustainable development policy. This will be the true test of the disaster management organizations and their links with local communities.

North America

Activities and accomplishments

Mexico

In the past two decades, according to the World Bank, more than 80 natural disasters in Mexico have resulted in the loss of some 10,000 lives and about \$11.8 billion in damages. Efforts by Civil Protection authorities have focused mainly on disaster monitoring, preparedness, and response. A recent World Bank report¹⁸ acknowledges that these efforts are crucial to mitigating the effects of disasters, but argues that the core of a mitigation program should consist of more “upstream” measures, such as the safe location, design, and construction of structures, infrastructure, and settlements.

Mexico has taken some important steps in this direction. Scientific advisory committees have been established, engineering advances have been made, schools have been retrofitted to withstand earthquakes, and a program for certifying hospitals that meet disaster readiness standards has been put into effect. A shift is underway from disaster response to disaster prevention and risk management, with the support of such agencies as the Economic Commission for Latin America and the Caribbean (ECLAC), the Central American Bank for Economic Integration (BCIE), and the Inter-American Development Bank (IADB).

An illustration of this trend is the launch in 2001 by President Vicente Fox of the Puebla-Panama Plan as part of his National Development Plan. This initiative seeks to accelerate the integration and development in a region that covers nearly 375,000 square miles, has 64 million inhabitants, and includes all seven Central American countries as well as the Mexican states of Campeche, Chiapas, Guerrero, Oaxaca, Puebla, Quintana Roo, Tabasco, Veracruz and Yucatan. One of the main objectives of this plan is to overcome the region's vulnerability to natural disasters and bridge a long-standing infrastructure deficit that has prevented its countries from profiting more from their proximity to large foreign markets. The Puebla–Panama Plan contains a natural disaster prevention and mitigation component that will upgrade the quality of meteorological and hydrological information in the region, where hurricanes, floods, earthquakes, tidal waves, volcanic eruptions, landslides, forest fires, and drought claim thousands of victims and cause hundreds of millions of dollars in economic damages each year.

In another nod to the growing awareness of the links between disaster reduction and financial and economic performance, the Plan will promote the development of a catastrophic insurance market to provide coverage for public infrastructure such as highways, bridges, schools, and hospitals. It is expected that this insurance will reduce the need to raise funds for reconstruction, and the premiums may act as an incentive for builders to construct public works that are more resistant to natural disasters.

Support will also be provided to the organization of public information campaigns to promote measures for reducing the region's vulnerability to natural hazards, which tend to

¹⁸ Kreimer, A., 1999.

affect the poor the most, even as their destructive power is heightened by human actions such as deforestation and building human settlements in areas at risk.

The Mexican Government, well aware of the country's vulnerability to risks from natural hazards, has taken important steps to mitigate their impact. It has developed disaster preparedness and civil defence programs led by the Department of the Interior and the Department of the Environment, Natural Resources and Fisheries (SEMARNAP), and implemented through the Civil Defence System (SINAPROC). It has also established the National Centre for Disaster Prevention (CENAPRED), the main objective of which is “to promote the application of technologies for disaster prevention and mitigation, to provide related professional and technical training, and to disseminate preparedness and self-protection measures among Mexican society exposed to the contingency of a disaster.” The organization also coordinates volcanic and seismic monitoring activities.

In 1998, a UN-Sasakawa Disaster Prevention Award Certificate of Distinction was presented to Dr. Roberto Meli, CENAPRED’s Director-General, in recognition of the Centre’s work and its commitment to disaster prevention and mitigation.

The municipality of Tijuana participated in the Risk Assessment Tools for Diagnosis of Urban Areas against Seismic Disasters (RADIUS) initiative, management plans based on those assessments and, most importantly, raise local awareness of seismic risk and affordable measures to reduce it. The Municipality has allocated funds for the implementation of micro-zoning studies, whose results will be used for city planning. In addition, Tijuana’s industrial sector asked the Municipality for assistance in assessing their seismic risk, in exchange for which it offered to fund seismic safety efforts for local school facilities.

United States

The existence of countless disaster prevention, preparedness and response programs for almost any group one can imagine—seniors, pediatricians, livestock producers, pet owners, neighborhood associations—is proof that a culture of disaster preparedness has taken hold in the United States.

Little more than ten years ago, to the extent that there was *national* awareness of the need for disaster preparedness, prevention and mitigation, it was focused on what lessons might be learned from recent natural disasters such as Hurricane Hugo (\$9 billion in damages, 49 fatalities) or the Loma Prieta, California earthquake (6 million affected, \$6 billion in damages).¹⁹ Other disasters abroad, such as the earthquakes in Mexico City in 1985 and in then-Soviet Armenia in 1988, also made Americans realize the value of pre-disaster planning—and not only regarding natural disasters. The 1986 accident at the Chernobyl Power Plant in the Ukraine gave US citizens a terrifying view of the effects of a nuclear power plant meltdown, an experience narrowly averted 10 years earlier at Pennsylvania’s Three Mile Island.

¹⁹ *Reducing the Impacts of natural Hazards: A Strategy for the Nation*, A Report by the Committee on Earth and Environmental Sciences Subcommittee on Natural Disaster Reduction, May 1992.

All this has increased the public's awareness of and proactive engagement in disaster prevention, resulting in the significant reduction of economic losses, the protection of property and the saving of lives, particularly during the latter half of the International Decade for Natural Disaster Reduction.

Every state has an office of emergency services, by one name or another. Linking these state entities are the Network of State Hazard Mitigation Officers (NEMO) and the National Emergency Management Association (NEMA), the professional association of state emergency management directors.

At the national level, the president, Congress and the federal supporting agencies have also worked together in recent years to promote awareness and action in the area of preparedness, prevention and mitigation. The Federal Emergency Management Agency (FEMA) is the U.S. federal agency in charge of helping people prepare for and respond to emergencies when the President of the United States "declares" a disaster of federal dimensions. The head of FEMA is appointed by the President and may or may not be a disaster professional.

Before 1993, FEMA's emergency preparedness activities were focused largely on response. Mitigation activities were primarily part of the National Flood Insurance Program, which was administered by the Federal Insurance Administration (a component of FEMA), and those mitigation efforts were primarily related to flood mitigation. It was not until the 1993 appointment of James Lee Witt to head FEMA that the mitigation function was segregated from FIA and a Mitigation Directorate was created for the first time in the history of the agency. Late in 1993, Congress amended the disaster statute to authorize more funding for post-disaster mitigation actions, and the availability of additional funding created a greater incentive to pursue mitigation efforts throughout the United States.

In the late 1990s, under the leadership of Mr. Witt, FEMA developed a program that was popularly known as Project Impact. Project Impact was designed to change the way America dealt with disasters--even before they occurred. To each new community that committed to the Project Impact partnership, FEMA offered expertise and technical assistance at both the national and regional level, and involved other federal agencies and states in the process. The objective was to put the latest technology and mitigation practices into the hands of local communities, and to guide these communities through a complete risk assessment process, allowing them to identify and prioritize those mitigation initiatives that would bring them the greatest benefits. Within only a few years, more than 250 communities have become Project Impact partners, as have more than 2,500 businesses throughout the country. Shortly after the current administration took office, FEMA's newly appointed director reconsolidated the Agency's mitigation program and the flood insurance program into a component of the Agency, which is now known as the Federal Insurance and Mitigation Administration (FIMA). Funds were also cut for the continuation of Project Impact.

In 2000, Congress enacted the Disaster Mitigation Act, which called for the implementation of pre-disaster mitigation measures that were cost-effective, improved hazard identification

and risk assessments, encouraged community hazard mitigation planning, and promoted public-private partnerships.

In part because of its economic and political orientation, in the United States the role of corporate involvement in emergency preparedness has become an important factor. An earlier man-made emergency, a major outage of the dominant AT&T telecommunications network, raised corporate America's attention to the need for preparedness (also known as "business continuity"). The financial, technological, and logistical capabilities of the private sector make it an eminently logical actor in disaster reduction. Examples include the Business and Industry Council for Emergency Planning and Preparedness, the Disaster Recovery Business Alliance, the Institute for Business and Home Safety, and the Public Private Partnership (PPP) 2000.

The growing professionalization of disaster management and related academic, scientific and administrative disciplines has also been dramatic in the past decade. Once viewed as the exclusive purview of individuals with military backgrounds, civil defence has evolved into the profession of emergency management--a profession that requires rigorous interdisciplinary training. A survey conducted last year by the *Natural Hazards Observer* and the Natural Hazards Centre in Boulder Colorado counted 42 graduate programs and 29 undergraduate programs at colleges, universities, and institutions, principally located within the United States, offering emergency management courses.²⁰

Canada

On February 5, 2001 Prime Minister Jean Chrétien announced the creation of the Office of Critical Infrastructure Protection and Emergency Preparedness (OCIPEP) to act as the Government of Canada's primary agency for ensuring national civil emergency preparedness and to enhance the protection of Canada's critical infrastructure—energy and utilities, communications, services, transportation, safety and government—which constitutes the backbone of the nation's economy and well-being. The Minister of National Defence, Art Eggleton, is responsible for this organization, which encompasses all responsibilities of what used to be Emergency Preparedness Canada (EPC). The Office provides national leadership to help ensure the protection of infrastructure, in both its physical and cyber dimension, regardless of the source of the threat, by developing and enhancing the capacity of individuals, communities, businesses and governments to effectively manage risk.

Although OCIPEP is a new organization, its responsibilities relating to civil emergency preparedness and planning have a long history. Through the former EPC, a great deal of experience in preparedness, response and recovery activities was gained. There have always been efforts across the nation to help mitigate disasters, including land use zoning guidelines, and structural protective features such as the Red River Floodway in Manitoba.²¹ In these cases, however, mitigation had largely been an implicit component of

²⁰ Colleges, Universities, And Institutions, Offering Emergency Management Courses, Natural Hazards Center, University of Colorado, Boulder, Colorado, December 4, 2000.

²¹ International Joint Commission, 2000.

other plans, and needed to be promoted in a more explicit and systematic way. It was not until the International Decade for Natural Disaster Reduction that calls by various individuals and groups to place disaster mitigation at the forefront began to bear fruit. The National Mitigation Workshop, hosted by EPC and the Insurance Bureau of Canada in 1998, and attended by academic, private sector and government representatives, concluded that a comprehensive national mitigation initiative would be a positive step towards the long-term goal of reducing vulnerability to disasters and the losses they bring about.

These ideals have been reinforced by participants of the ongoing Canadian Natural Hazards Assessment Project (CNHAP). A community of scientists, scholars and practitioners in the natural hazards and disasters field in Canada who came together early in 2000, CNHAP members began a major new assessment project which examines the causes and consequences of natural hazards and disasters. Background research papers from this project are now becoming available, and more will be published in an upcoming special issue of the *Journal of Natural Hazards*. Interesting research has also been done in the area of disaster preparedness, mitigation and risk management as it relates to climate change.

Within the framework of the growing economic integration of North America, EPC coordinated in 1999 the production of the *North American Map of Natural Hazards and Disasters*,²² produced by The National Geographic Society. The project was instrumental in initiating cross-border dialogue and the sharing of knowledge between hazard experts and national, state/provincial and local organizations that have a vested interest in supporting mitigation and emergency preparedness in Mexico, the United States of America, and Canada.

Future challenges

In Mexico, much remains to be done to reduce vulnerability to disasters in the long term. Pending tasks include the need to create incentives and adopt regulations that will encourage individuals and businesses to reduce the risks they face and promote a culture of prevention. The regulatory approach to encouraging disaster mitigation in Mexico requires a comprehensive reassessment of formal building codes and land-use management laws and regulations, so that they can effectively contribute to public safety in the informal sector.

As already initiated by CENAPRED, active programs of dissemination, targeted professional training, and broad public education on disaster risk and mitigation should be developed and delivered throughout Mexico. These programs should include the dissemination of information on natural hazards, the inclusion of disaster preparedness and mitigation materials in elementary and high school curricula, and special programs to target low-income communities.

In recognition of the fact that most mitigation decisions are made at the community level, resources must be allocated to increasing capacity and authority for risk management and disaster mitigation at the state and community levels.

²² The National Geographic Society, 1998.

While it is apparent that the field of disaster reduction reflects the degree of economic and technological development of the United States, plainly superior to that of its southern neighbors, this does not mean that there are no pending issues, or that reversals may not occur.

The terrorist attacks of 11 September 2001 have had a severe impact on the public's—and politicians'—perception of what a disaster is. If the average US citizen were stopped in the street and asked to define disaster prevention, he or she would probably mention increased airport security, a stricter immigration policy, and increasing the availability of antibiotics against anthrax. The danger is that citizens and government officials will lose sight—at least until the next major earthquake or hurricane—of the importance of continuing to pay attention to those catastrophes that have nothing to do with terrorism.

Bearing in mind the scientific consensus on climate change and the role of human actions, moreover, the United States faces a significant challenge, the outcome of which will not only affect the country but the planet: the need for it to assume responsibility of being the nation that, with only 4% of the world population, is the producer of 25% of carbon dioxide emissions worldwide. The current emphasis on increasing the national extraction of fossil fuels and the use of nuclear energy have made critics wonder whether the risk of new environmental disasters may not increase.

Canada, another highly industrialized country, has its own challenges. A 1999 paper for EPC, Environment Canada, and the Insurance Bureau of Canada discusses the vulnerability of Canadian society as it becomes increasingly complex, with economic and societal costs of natural disasters increasing each year. The authors' reading of demographic projections suggests that more and more Canadians will live and work in regions with significant natural hazard risk. They argue that the need to encourage timely, cost-effective means to save lives, reduce property damage, and limit disaster costs has never been more apparent, particularly with the prospect of extreme weather events becoming more frequent and severe due to climate change. The authors call for a higher national priority for hazard mitigation, prevention and preparedness activities. "Clearly," they say, "in spite of past efforts, a need exists to renew and improve the framework for setting long-term national goals and the establishment or improvement of technical standards and a system of evaluation of progress."²³

In light of these and other cross-sectoral, multi-disciplinary discussions regarding emergency management and disaster mitigation, the Government of Canada, through the Ministry of National Defence, announced on June 26, 2001 that OCIPEP will lead consultations on the development of a National Disaster Mitigation Strategy (NDMS). The challenge, then, will be to see if all stakeholders can come together around a strategy that will focus on sustainability and reduce the rising vulnerability.

At the sub-regional level, it is also clear that the growing commercial links between Canada, the United States and Mexico, at once united and divided by 12,000 km of borders and a growing flow of legal and illegal immigrants, call for the development of joint

²³ James, P. and others, 1999.

disaster reduction policies. Considering, however, that the ultimate goal is a hemispheric Free Trade Area, the search for such policies may well have to be expanded, from Alaska to Tierra del Fuego.

Conclusions—current trends and future challenges

Current trends

- There is a growing recognition of the social and economic benefits associated with disaster risk reduction activities throughout the Americas, which is shown in new policies, allocation of budgetary opportunities for such activities and conceptual developments.
- In most countries in the region, there is an increasing tendency to move from solely disaster response and preparedness oriented mechanisms towards integrated multi-sectoral approaches and institutional reforms focusing also on long-term preventive measures, including environmental and land use planning considerations. In many cases, this is accompanied by reform legislation and policy integration reflecting a more proactive approach and multi-sectoral assignment of responsibilities. Growing emphasis is being placed on strengthening institutions at the local and community level.
- In the field of education, there is an increasing number of universities offering postgraduate studies and masters programs on risk management and disaster reduction. Furthermore, in many countries efforts are made to include disaster reduction in the school curricula at different levels.
- In the field of health, one of the first to internalize the need for disaster reduction, vulnerability and mitigation assessments are being incorporated into many of the hospital infrastructure projects, as well as in the management of water and sanitation systems. Moreover, local health centers often play a significant role in areas such as risk assessment and integral disaster management plans at the local level.
- Regional or sub-regional institutional mechanisms (such as CEPREDENAC, CDERA and PREANDINO) have shown to be crucial to further a multidisciplinary approach and support member countries to engage in comprehensive disaster risk reduction practices and institutional development in that regard.

Future challenges

Despite the accomplishments and the wide range of activities being promoted in the Americas, at different levels and including governments, local organizations, NGOs and international agencies, a number of problems still must be addressed to enable further progress and make disaster risk reduction effective.

- There is still need for greater policy integration and to raise awareness among high-level governmental decision makers to ensure that their commitments are linked to

sectoral and decentralized development, and that they respond more effectively to the concerns of local authorities.

- While there is a myriad of individual technical, scientific and academic initiatives underway related to different aspects of hazards, vulnerability and risk reduction, there is still ample space in which to improve collaboration among them and harmonization of these diverse activities.
- There is a need for far greater mobilization and interest on the part of governmental decision-makers to join forces with sectoral and territorial development organizations, particularly in relation to land use management and planning. This will require a more imaginative use of convincing political arguments favoring risk reduction than have been employed to date. Particular attention needs to be given to members of government economic cabinets-- Finance, Commerce, etc.
- Institutional approaches, building systems: While traditional approaches to disaster management and emergency assistance (mainly civil protection) will remain important mechanisms during crisis and preparedness, in the future they may not be seen as primary 'home' to comprehensive risk and disaster reduction mechanisms, but rather as a 'contributor' to the multi-sectoral approaches (including sectors like finance, health, agriculture, education, etc.) emanating from coordinating ministries (such as Planning, Environment, Economic Development, etc.) or senior levels of political authority (Office of the President, Prime Minister, Cabinet Committee, etc.).
- Countries need to incorporate natural disaster and risk reduction considerations into development plans, relevant program and strategies, ensuring that sufficient human and financial resources are provided to sustain commitments towards the realization of longer-term objectives. The preparations for the Program of Action of Johannesburg for sustainable development could provide a valuable opportunity to develop the commitment towards disaster and global risk reduction by national environmental and development authorities.
- There is still a great deal of work to be done to promote vulnerability reduction and the need to incorporate risk assessments and mitigation measures in all development programs and projects (critical facilities, etc.), in bilateral, multilateral as well as national programming. The major financial institutions in the region (World Bank, IADB, BCIE, Caribbean Development Bank and the Corporacion Andina de Fomento) have all introduced important changes in this regard. Their collaboration and partnerships among themselves as well as with other relevant international strategies or conventions (Climate Change, Desertification, Biodiversity, ISDR etc.) still have, however, a long way to go. Whilst the occurrence of a disaster may be the best promoter, it is our duty to go beyond lip service and make the managerial and leadership changes that are required to ensure effective collaboration.
- The greatest and potentially most effective challenge remains: to build a culture of risk reduction and professional attributes into educational curricula, both to increase the number of professionals engaged in practice, but also to lay the ground for changes in

values, attitudes and behaviors across generations. As the world becomes more crowded and vulnerable in the future, disasters are likely to increase. However, the social, ecological and economic negative impact of disasters can be reduced if we act today with future generations uppermost in mind.

”There is a clear financial incentive for disaster reduction and prevention. In the 1960s, natural disasters caused some US\$52 billion in damage; in the 1990s, the cost has already reached US\$479 billions. More effective prevention strategies would save not only tens of billions of dollars, but save tens of thousands of lives. Funds currently spent on intervention and relief could be devoted to enhancing equitable and sustainable development instead, which would further reduce the risk for war and disaster.

Building a culture of prevention is not easy. While the costs of prevention have to be paid in the present, its benefits lie in a distant future. Moreover, the benefits are not tangible; that are the disasters that did not happen”.

Kofi Annan, Secretary General of the United Nations

HEALTH, WATER AND SANITATION²⁴

General

According to the World Health Organization, health is the state of complete physical, mental and social well-being. The condition of being vulnerable or exposed to disasters is not compatible with mental, social and physical well-being. For the health sector, risk reduction and disaster management is not limited to engineers and economists, but rather constitutes a public health priority. Thus, a dilemma arises: is risk reduction a health issue or an economic issue? It is necessary to recognize that a state of health cannot be achieved without considering the cost-benefit ratio of a particular decision. We know that regardless of its scope or magnitude, every decision has an associated monetary cost, but the fact is that disasters and their impact on health are not simply economic phenomena with an associated price tag; they are social and human phenomena. Possible losses quantified based on vulnerability to disasters are measured not only by bankers and financial analysts in terms of lost or unearned dollars; it is important to strike a balance between the economic dimension and the social factors. Access to safety from disasters is a human right and a social obligation at the same time.

The health sector has played an important role in training human resources and in preparedness, prevention and mitigation activities. But once the impact has occurred, the health sector has also played a significant role in response, a performance that has deserved ample recognition from all sectors. This recognition applies not only to response but to rehabilitation and reconstruction as well.

Preparedness for this sector includes everything that is necessary to adequately respond to a disaster. Once there is acceptance of the fact that some human and material losses might occur, preparations should be made for responding after the impact. Examples include preparation of hospital plans and emergency services, etc.

The most desirable situation would be to prevent the impact of the disaster from occurring all together. The health sector has an evident need to implement measures to ensure operation of its own buildings that house health facilities and water supply, so that these are not affected by disasters and continue to operate during the emergency, when they are needed the most.

The organizations that render and manage health services in the countries (ministries and social security institutions) as well as water supply and sanitation services (water companies, municipalities, NGOs, communities) should consider emergency situations generated not only by natural disasters but also by chemicals, radiation and armed conflict.

The change from a preparedness/response approach to the true integration of prevention and reduction of vulnerability into the development processes of society, has not been as swift as one would like. The most important factor for this change is not found in the

²⁴ Claude de Ville de Goyet of the Disaster Program, Pan American Health Organization prepared the sectoral discussion document and the PAHO team was responsible for coordinating the work group.

speeches and actions promoted by bilateral organizations such as USAID/OFDA or multilateral and United Nations agencies such as PAHO, but rather in the joining of wills to effect the change caused by the occurrence of a disaster.

Although agencies were able and ready to face the tragedy, the 1976 Guatemala earthquake was the event that forced ministries of health to face the need to prepare for natural disasters. The 1985 Mexico earthquake, in which several hospitals collapsed, convinced ministries of health and PAHO to begin working on disaster mitigation for health facilities, having observed the uselessness of health personnel well trained in disaster assistance if they die inside these facilities or if the buildings are crippled and cannot provide the required services. It is important to consider what would happen if the building collapses with patients and health staff inside, and to analyze what the staff response would be when facing this emergency to satisfy their own needs and the growing demands of the population.

The impact of Hurricane Mitch reaffirmed the need to include disaster issues in long-term planning. The goal of the health sector has been to create, strengthen and accompany the designation of a focal point, a specialized unit in each health ministry. The human factor, trained human resources and not simply well-stocked warehouses, has been the key to the success of the health sector.

Although this chapter does not address preparedness or response, it recognizes that these are key health sector areas that have opened the door to opportunities for the sector to demonstrate concrete results in prevention and mitigation.

Areas of intervention

The approach of the health sector to mitigation comprises three essential areas: hospitals and assistance centers, water supply systems and food security.

The Americas region, particularly Latin America and the Caribbean, are frequently impacted by natural disasters that, in addition to causing loss of life, injuries and public health problems, have caused severe damage to hospital infrastructure and water supply systems. ECLAC reports that over a 15-year period (1981-1996), a total of 93 hospitals and 538 health units were damaged by natural disasters.

Interruption of hospital services or water supply generates a great social as well as political impact, when access is lost to services that the community considers to be fundamental to well-being, security and health care.

Hospitals are in a category profoundly different from any other facility. For example, while schools are occupied five days a week for an average of eight hours per day, hospitals house the only public services that operate day and night with sophisticated physical facilities and specialized human resources, making them even more vulnerable. In addition to daily operations, once a disaster occurs, hospitals must (without neglecting routine responsibilities) increase their service-rendering capacity to respond to the greater demands generated by the disaster.

The cost of a hospital is not limited to its physical structure and electro-mechanic and architectural components. A hospital contains highly sophisticated and costly equipment that must be protected. The cost of mitigating the vulnerability of hospital facilities varies significantly depending on the type of hazard and the degree of intervention of the mitigation measures. For example, costs associated with retrofitting for hurricanes are significantly lower than for earthquakes. It has been estimated that the investment required to include the preventive measures necessary to increase a hospital's resistance to disasters prior to construction raises the total costs by about only 2 %. Incorporating mitigation measures, in addition to protecting the investment made, ensures the availability of health services during and after a disaster.

The goal of mitigating the vulnerability of health facilities is to protect the lives of occupants, to ensure continuous and correct operation of all services and to limit damage for easier recovery. For the community, a hospital is a symbol of its resistance, its defense against certain adverse effects of nature. At the same time, it is an indicator of government commitment to the assistance and well-being of its population.

What does mitigation in hospitals mean? Mitigation goes beyond the vulnerability analysis for either reinforcing the structure of existing buildings (retrofitting), or for adjusting preparations (response plans) for the existing vulnerability and any possible damage that may occur. In the Caribbean, for example, one hospital has lost its roof ten times in 35 years. To a point, it could be said that the international community has contributed to this situation, in one way or another, as it has financed reconstruction while the hospital maintained the same degree of vulnerability. This has begun to change in recent years, but difficulties have been encountered due to resistance to change. Although attributable in part to the countries, it is also characteristic of the international community, banks and agencies.

It should be noted that in Colombia, structural reinforcement of a hospital was completed in 1999 and the building was able to withstand the earthquake in the city of Armenia. There are other success stories in the region; however, no political will yet exists and therefore it is not reflected in the commitment, the definition of priorities and the allocation of the necessary resources.

Large-scale potable water systems contain physical elements or components with such high degrees of vulnerability that, when affected, can cause interruptions in the potable water supply for long periods of time, which can significantly impact the population.

For example, many water supply systems were affected by landslides caused by the January and February 2001 earthquakes in El Salvador. Although some of these involved only small portions of the supply line (20 meters of pipe), it was enough to cut off water supply to more than 10,000 families.

With hospitals, when one building or unit is out of operation following a disaster, the entire health network does not shut down. On the other hand, the vulnerability of water supply

systems, whether the entire system or individual components such as supply lines, intakes, treatment plants, and storage tanks, may completely cutoff the supply.

Water supply networks are much more vulnerable to different types of disasters, given their size, which is often spread out over hundreds of square kilometers, distance from the source to the distribution points. Often access to the systems and components hamper rehabilitation efforts.

As with hospitals, the costs of mitigation measures for water systems vary significantly according to the type of hazard and the kind of intervention. In these systems, however, it is impossible to suspend supply during the implementation of mitigation measures. Thus it is important for these systems to be designed and built considering the preventive measures necessary to withstand natural hazards.

The mitigation objective for large-scale potable water and sanitation systems is to protect the quality and quantity of water supply to the population during an emergency. Health risks to the population in a disaster increase to such levels that it is absolutely necessary to restore the service immediately. Therefore, potable water and adequate sewage treatment constitute fundamental services that are more important in disaster situations than under normal conditions.

Damage to potable water systems that interrupts supply brings the disaster into the lives of portions of the population that were not directly affected by the disaster.

As discussed before, it is necessary to consider prevention and mitigation measures in system planning and design; if not, companies providing these services should have the human resources and materials to restore supply as soon as possible in order to protect the population.

Some of the strengths of the health sector are:

- Reinforced buildings and hospitals that resisted disasters
- Expert teams
- Collective knowledge
- University education
- Large investment in the rehabilitation of large-scale services
- Reinforced water systems
- Professional groups with experts on the subject
- Many NGOs involved in water and sanitation issues
- Undergraduate and graduate education centers

Among the weaknesses of this sector:

- Codes do not specifically consider hospital facilities.
- Hospitals cannot be replaced in a short period of time.
- Lack of a mitigation culture.
- No clearly designated institution responsible for both the water and sanitation sectors.

- Neglect by many countries reforming and decentralizing water services to consider the issue of vulnerability.
- Legislation and technical criteria do not ensure the incorporation of measures in design and construction.
- Large investment in rehabilitation, not much in prevention and mitigation.
- Diversity and large number of systems affected by a disaster, which requires assigning priorities, as it takes a long time to accomplish total rehabilitation (After Hurricane Mitch, more than 900 systems just in Nicaragua).

Group discussion

Aware of the need for a comprehensive approach to risk management issues, the health sector has sought to become involved with cross-cutting issues such as finance, civil society, information technology and land use management.

In the interaction with Finance, it is important to start a dialogue between the sector and the financial agencies, which would take place at the country or the international level, through bilateral and multilateral organizations. In many countries it is common to see that the health sector has not adequately involved the financial sector.

It is necessary for the financial sector to accept that disaster risk is not merely a problem of financial cost and benefit. There is also a social reason, practically a human right, that the health sector must meet. The privatization process that many services are undergoing in the region does not help the matter. On the other hand, there is an imperative need for financial organizations to require the inclusion of mitigation and prevention measures as a condition for granting loans and grants. It is inadmissible to see that even today, in the Caribbean, some agencies build health infrastructure and reject the inclusion of prevention and mitigation measures.

Civil society must be involved in the mitigation and prevention processes. Participation should occur at all levels and in all tasks undertaken. It is necessary to create a common front that is aware of the importance of mitigation, a front with broad representation from civil society, that in turn demands decided political support. In recent years, various actors in civil society, organized either in NGOs, professional associations or universities, have been able to exert more pressure over states.

In the case of land use management, the situation is quite different. A dialogue must be established to determine the balance between the services rendered by the health sector and the water/sanitation sector and the access the population has, and risk, in a manner as to minimize the latter while altering the former two as little as possible. Many times, the vulnerability of health, water and sanitation infrastructure is largely due to its location in high-risk areas that coincide with the places where the population has settled.

As is well known, in our countries poverty is associated with the population settling in high-risk areas. Health, water and sanitation services are installed in these areas after the population has arrived, this in some way “legitimizes” the settlements.

A dialogue has not yet begun, but should be initiated. Land use management experts should actively participate in decisions regarding the distribution of the health services network and the provision of water and sanitation services. Above all, they should control population settlements in high-risk areas.

Land use management experts could also participate in other discussions, such as the need to have a two-thousand bed hospital or whether it would be more advisable to distribute these beds among five hospitals with four hundred beds each. In addition, by preventing people from locating in highly vulnerable areas, exposing public and private infrastructure to various natural hazards could be avoided.

To a great extent, risk and disaster management, both in response actions as well as in building a prevention culture, is based on information management. Appropriate use and mastering of this tool could open doors to increasing our technical and scientific knowledge and to seeking community support and involvement, facilitating faster implementation of risk reduction and prevention. A person cannot change a chartered course, but a combination of circumstances, people and institutions can. During our first contacts with ministries of health, twenty-five years ago, we could see they didn't know about the existence of civil defense or where the Red Cross was located; the health sector was completely isolated. With the experience gained from several disasters, and with technical assistance from international organizations, the situation has changed in many countries.

In order to facilitate the incorporation of the health sector into risk management, the following section explores objectives and recommendations for four vital areas linked to the health sector: finance, land use management, information technology and civil society.

Finance and health

Objectives

To raise awareness of existing problems among health policy designers and those that develop policies within the financial sector and to identify possible areas of action to improve access to financial resources for mitigation.

To incorporate prevention measures in new health infrastructure projects and mitigation measures in existing infrastructure. To prepare the corresponding additional budget for each case.

Recommendations

In general, it could be said that the financial sector and the health sector have different objectives regarding this issue, and therefore, it is necessary to maintain space for dialogue between the two and to further joint activities that could improve funding of mitigation programs in existing health and water system infrastructure projects.

Terms such as financial risk and health risk make existing differences very clear. If we are to understand that *risk reduction* responsibilities are shared, it is necessary to immediately

develop tasks to bring these concepts and different viewpoints together. Savings during the initial investment phase can be wiped out by huge losses after a disaster.

It is important to develop a “*guideline*” or a “*frame of reference*”²⁵ that will reduce investment risk, from the perspective of both the financial and health sectors.

Land use management and health

Objectives

To identify specific actions that connect reduced vulnerability in health facilities and water systems to land use management processes.

To identify information on natural hazards or risks to be considered when selecting health facility locations.

To suggest policies that include mitigation in health facilities and water and sanitation systems in appropriate land use management plans.

To identify standards and criteria for risk and to adopt controls for appropriate land use as it relates to health, water and sanitation systems.

To identify the technical persons responsible for evaluating the existing vulnerability in health, water and sanitation systems and for reviewing new facility or expansion projects in land use management plans.

To identify participation of the health sector in land use management processes including development, evaluation and approval of plans and projects directly related to health, water and sanitation facilities and their vulnerability to natural hazards.

Recommendations

An awareness raising process should be initiated so that needs of the health sector regarding risk reduction can be understood by those responsible for land use management. The vulnerability of health facilities and water systems must be assessed not only for physical risk but also to see whether they could operate in case of a disaster.

Health infrastructure and water systems should be evaluated to ensure that the most strategic parts are the least vulnerable.

It is recommended that land use management information be available to health sector officials. In addition, the health sector shall have a counterpart in land use and planning institutions.

²⁵ After the Hemispheric Conference, PAHO and the World Bank commenced joint preparation of a global guideline, "Disaster Vulnerability Guidelines For Hospitals".

Information technology and health

Objectives

To define the available information technology potential and what future alternatives might exist for vulnerability reduction work in health facilities and water systems.

To identify and incorporate key information technology elements for prevention and mitigation in health facilities and water systems.

To explore new information technology uses in the area of risk reduction. To identify strategies for integrating technical information through information networks.

To review lessons learned regarding the use and application of information technology in mitigation work for health institutions and water systems.

To enable the use of information technology in decision-making on investment in projects that include mitigation measures.

To identify and use the technology available in the information networks and to determine its importance for risk management.

To explore possibilities for joint work between the health sector and information technology development projects.

Recommendations

Important technological tools are now available to understand and address risk issues. In addition, there is an interest in developing and implementing *open and flexible* systems capable of being adapted to the requirements of the health sector to reduce its vulnerability.

It is necessary for the health sector to generate incentives for universities or corporations with research units to take interest in the issue and to commit to new projects. Information technology processes can and should be worked out at the sub-regional level.

The health sector must make an effort to systematize existing information and to improve coordination with the generators of information on vulnerability and risk.

Civil society and health

Objective

To define the roles and potential of the different actors of civil society that can contribute to the reduction of vulnerability of health infrastructure and water systems.

Recommendations

Organized civil society should play an increasingly important role in risk management programs and to this effect, its participation should improve in the different tasks undertaken. Social movement and community organizations should begin to play a leading role in society and exert important social pressure on the state.

Information on risk reduction and mitigation has not been adapted to community language and it is necessary for the social sector to work on mechanisms to improve communications with civil society.

It is necessary to strengthen the work of professional associations and different universities and to provide incentives for their participation in producing scientific knowledge applicable to the reduction of vulnerability and educating qualified human resources in these areas.

General comments

Hospital networks and water distribution systems face specific risks not shared by other sectors.

The health sector shall foster development, jointly with the finance sector, of a “guideline” or “frame of reference” for mid-term implementation of mitigation projects in the region.

The health sector must raise awareness among its officials regarding the functions of other sectors such as finance and on key issues such as those related to land use management.

Tasks related to risk reduction must contribute to sub-regional integration processes in the health sector as well as in other sectors of development.

EDUCATION²⁶

General

Society is increasingly exposed to different types of risk, largely due to ill-conceived or inappropriate development processes. Consequently, societies face the enduring probability of suffering significant damage to persons, goods, services and the environment.

Far from showing a decreasing trend, this situation seems to be worsening, as countries exhibit more factors that contribute to risk, specifically poverty and its consequences on community safety.

One of these consequences is the difficulty in accessing education that millions of children and youth in the hemisphere face. The educational curriculum itself increasingly lacks values associated with social welfare, solidarity, self-esteem and respect for others.

The recent disasters in the Western Hemisphere have again made evident the need for communities to receive basic education on risk and disasters. This would allow communities to identify, avoid or correct social behaviors that might generate new risks, so that they are properly prepared to mitigate risks and face possible disaster situations.

This basic training should no doubt be provided by the educational system at all levels, whether through the national education systems or through other non-traditional and informal means.

Populations must create social mechanisms that support the avoidance or mitigation of risk to reduce the consequences should a disaster occur.

Social safety education should integrate all efforts undertaken by society in training and education that implicitly includes the concept of risk in all its actions, in such a way that every human activity reveals a strong commitment to creating safer living environments and to respecting the safety of others as well as their own well-being.

These national and regional efforts aimed at risk reduction education are represented in the education sector, led by the respective ministries of education of the countries but which must include all educational activities that different government and non governmental institutions develop to respond to risk prevention, mitigation, and preparedness to respond to emergency and disaster situations.

The contribution of this sector to fulfilling its risk management mission can be summarized in three major areas: the training which allows the most appropriate education for present and future generations on the subject; ensuring the physical and psychological integrity of hundreds of millions of students that attend primary, secondary and higher education

²⁶ Pedro Bastidas of the Organization of American States (OAS) and Manuel Ramírez of the Office of Foreign Disaster Assistance (USAID/OFDA-LAC) prepared the sectoral discussion document and conducted the work group.

institutions, who are susceptible to risk and to adverse events in the facilities, and the national security role, with the integration of this sector into other sectors of society such as health, housing, agriculture and livestock and energy, in order to become a part of the “*national emergency or civil defense plan.*” Inter-institutionality and inter-sectorality, in this case, become the fabric that enables the necessary integration, which lends force to the sector and to the national emergency plan itself.

Areas of intervention

In order to fulfill the fundamental functions of the sector, it is necessary to develop what can be considered its most important components, which, in turn, are also the areas of work. More than rigid parts of a whole, these areas should be considered as the necessary ingredients to be taken into account when striving for integrated and effective progress in the sector, with a broad vision in scope and projection.

Legal area: Includes the legal foundation required by the sector to effectively implement its proposals. This area should include consideration of the legal elements of the Political Constitution, the general education law and the provisions of the national development plan, the national education plan and the national emergency and civil defense plan.

Planning area: Considers the “*national risk reduction education plan*” that explains the educational scope of the issue, the commitment of the sector to this task and its responsibility for emergencies or national disasters. It should involve all levels and modes of formal education and define the ways to integrate informal education into a single effort, reaching beyond the classroom and into the home and community.

Organizational area: Aims at integrating the different national and international institutions and organizations into a single effort where each, without losing sight of its specific objectives and areas of specialty, carries out its activities in a shared manner, with a clear sense of complementarity.

Academic area: Includes the proposed curricula that determine the national and local reality and scientific framework on which the educational content is based. At the same time, it includes guidelines on the type of education and training for teachers at all levels of the Educational System, including normal schools and universities that graduate teachers. This area should also include all elements related to educational technology that will ensure the type of learning sought in this field.

Equipment and infrastructure: Ensures the quality of educational buildings and key facilities such as classrooms and laboratories, particularly in universities where hazardous materials are used; the maintenance and strategies to ensure current conditions, as well as the equipment used for various purposes.

Research: From within the sector, it allows research to be promoted as an educational exercise for social projection, and permanent contact by the sector with institutional and community agents that generate new findings capable of building links between education and risk reduction.

Resources: Attempts to ensure, through inter-institutional contributions and the definition of specific strategies, the human and material resources necessary to accomplish the goals sought by the sector. The purpose of this area is not to create a single fund or resource bank; instead it is to better organize the available resources so there is no duplication of efforts, seeking to achieve greater efficiency and effectiveness in risk management.

Feedback: Found in the sector's planned evaluation activities, which, as part of its permanent management, helps to identify strengths and weaknesses to enact improvements as necessary and to contribute to the evaluation of national education and emergency plans.

At this time, no country in the hemisphere can presume to have the strength needed in the education sector to ensure adequate education on this issue, safety in their facilities, or sufficient support of the strategies outlined in the national emergency or civil defense plan. Each country has a different level of progress in developing and complying with these key functions; however, some strengths can be observed in the hemispheric development processes in the education sector.

Some current strengths of the education sector:

- Its mission to educate the present and future generations of the hemisphere.
- Presence in all countries of a ministry of education, the sector leader, whose organization facilitates, for itself and other institutions, structure, educational contents and risk management strategies with the assurance they will reach the communities far removed from large urban centers.
- The large number of institutions make up the sector and are distributed throughout the national territory.
- The hundreds of thousands of people that work for sector institutions, mostly in middle and higher education.
- Infrastructure and equipment resources found in primary and secondary education centers as well as in universities that can be used in prevention and mitigation tasks, as well as in disaster preparedness.
- Is able to maintain a close relationship with the civil population and the communities.
- Its mandatory legislation and decrees for all personnel is national in scope, which allows regulation of what is appropriate for risk and disaster issues in the country, from the standpoint of the education sector.
- Together with other sectors of society, it is a part of national emergency and civil defense plans.
- The sector has the capacity to respond to demands in the fields of prevention and mitigation as well as preparedness and response.

Weaknesses identified:

- Except in some isolated cases, there is insufficient legislation to directly support application of key sector functions related to risk management. Where it does exist, implementation is deficient.

- The short-term vision of the ministries of education complicates the necessary approach to risk management.
- In the education field, various risk management projects exist in isolation, which makes program follow-up and adequate use of available resources difficult.
- Most countries don't have a national education plan for risk reduction to guide and regulate the efforts in this field by national and international institutions.
- The organizational charts of most ministries of education do not include an agency with the human resources and materials necessary to accomplish sector coordination. In some cases, there are small one or two person offices that belong to higher departments or directorates. This undermines their development or weakens their efforts, as usually the main functions they carry out are of a different nature.
- Ministries of education do not earmark specific budgets to finance risk reduction education work.
- International organizations do not yet provide the necessary financial support to integrate programs within the sector, and when provided, this funding is for specific and isolated activities.
- Specialists and technicians have minimum access or little direct participation in the processes to determine loans and donations for risk reduction.
- Education for risk prevention and mitigation and disaster preparedness is still not present in the agendas of most officials that determine the development policies for the country.
- The necessary mechanisms to obtain greater participation by civil society in planning and implementing risk reduction national and local strategies have still not been created.
- There are not enough trained risk management educators in primary, middle or higher education.
- The contents and coverage of education curricula programs are insufficient.
- The possible contribution of educational technology to risk management has not been sufficiently explored.
- There are insufficient links between sources of knowledge in areas and disciplines related to the field and to the education sector.
- Research to improve teaching content and methodologies continues to be insufficient.
- Funds associated with recent disasters in the hemisphere have not often been used to create and implement effective strategies leading to the sustainability of risk management education.

Group discussion

Although there is still much to be done to achieve the conditions in the hemisphere that will lead to the development of true educational processes on risk and disasters, a number of changes can be observed in the countries that demonstrate new ways to achieve better results in the short, medium and long term:

- In practice, more attention is being paid to education at local, national and regional level, as a resource and a useful factor in risk reduction.

- Gradually, the budgets of international bank loans and donations are allocating more resources to educational activities for the sector.
- A balance has begun to emerge between the approaches to efforts that have historically focused on preparedness and response and efforts towards risk prevention and mitigation, through educational activities.
- The increased interest of the countries in designing a national emergency or civil defense plan is increasing the possibility of preparing an integrated national strategy aimed at the education sector.
- Teacher education institutions in the countries are becoming more interested in including contents in their own plans and programs that enable better education in the field for future teachers in the countries.
- Regional and hemispheric education planning has become consolidated after an interesting process that started in Antigua, Guatemala in January 1996, when the Ordinary Meeting of Ministers and Vice Ministers of Education in Central America approved the Strategic Institutional Annex on Disaster and Risk Education and Reduction of Vulnerability. Sponsored by CEPREDENAC, OAS and CECC, the agreement was strengthened at the XVI Ordinary Meeting of the CECC held in El Salvador on 25-26 October 1996.
- With the support of the OAS, IDNDR, OFDA, PAHO and Universidad Central de Venezuela, among other institutions, the Hemispheric Conference of the Education Sector for Mitigation of Risk and Socio-Natural Disasters was held in Caracas, Venezuela from 15-17 September 1997. The main output of the Conference was the Hemispheric Plan for Reducing the Vulnerability of the Education Sector to Socio-Natural Disasters.
- Based on the Strategic Institutional Annex, the Central American Meeting for Coordinating and Integrating Risk and Disaster Education, which was held in Panama 3-8 June 1998 with the support of CEPREDENAC, CECC, GTZ and OAS, drafted the Central American Risk and Disaster Educational Plan. The Plan was officially published in August 1998.
- Proposed curricula exist in some countries, as cross-cutting themes in most cases, which enable the systematization and extension of the study area among primary and secondary education students.
- Curriculum design processes in the countries now include various aspects of the issue.
- Although the percentage is still small, more teachers are being trained in school safety techniques.
- Universities are more committed to educating students using research and extension activities, promoting new and more in-depth knowledge of the area.

- The relationship between the institutions that have traditionally worked on disasters and risk management and institutions in the education sector have strengthened, resulting in richer educational content and more available resources.
- There are now better mechanisms to guide and control education infrastructure construction and adequate maintenance.

In order to facilitate the incorporation of the education sector into risk management, the following section explores objectives and recommendations for four vital areas linked to education: finance, land use management, information technology and civil society.

Finance and education

Objective 1

Specialists in education, risk and disasters should promote closer relationships with financial entities, to enable more relevant funding in the education field in accordance with the criteria of technically knowledgeable personnel.

Recommendations

Take advantage of internal (national and institutional budgets) as well as external funding sources (Inter-American Development Bank, World Bank, others).

Improve risk estimates based on technical-economic recommendations.

Objective 2

To establish the conditions for the creation of an insurance market.

Recommendations

Implement policies and regulations to this effect.

Provide more information on the risks.

Establish facility audits and inspections as well as effective application of codes.

Objective 3

To promote prioritization of prevention and mitigation at the political level (Ministries of Education and Planning) in order to obtain more funding.

Recommendations

Establish the responsibilities and authority of the ministries of education and the national risk management systems and other social actors in coordination with financial entities such as the social investment funds.

Establish incentives to motivate investment in prevention and mitigation to avoid an influx of resources only after disasters occur.

Damage assessment before and after disasters should take into account indirect losses in order to justify investing in prevention, mitigation and preparedness.

Objective 4

To improve budgets for construction and building conditions.

Recommendations

Apply construction and inspection standards as a shared responsibility of the sector and the financial institutions.

Adhere to location, design, construction and maintenance codes and standards.

Undertake audits and inspections of educational facilities by independent entities.

Land use management and education

Objective 1

To identify information sources on hazards associated with the land where education centers are located.

Recommendations

Collect information related to the location of hazards, intensity and frequency of adverse events in specialized institutions.

Inform the responsible actors and beneficiaries of educational services about the real risk conditions where educational infrastructure is or will be located.

Objective 2

To define or comply with the procedures for approval of land where educational infrastructure will be located.

Recommendations

Identify the regulations in force related to the selection of land for educational buildings and the characteristics associated with existing hazards.

Recognize the tools afforded by land use management to be used in the selection of areas for educational use facilities.

Adhere to the standards and recommendations of the codes in force before accepting land donated for construction of school infrastructure.

Information technology and education

Objective 1

To take advantage of technological advances in information management without neglecting the media that have traditionally been used for this function.

Recommendations

Take advantage of the modern information management media while recognizing that many educational institutions still do not have access to them.

Promote the use of local radio as the medium for disseminating educational information and messages.

Local education authorities should ensure that valid and updated information for risk management education reaches teachers and classrooms.

Objective 2

To undertake studies and inventories of the information available at education centers and the real information needs that exist.

Recommendations

Identify the sources of information that can be accessed by education centers, starting with what existing information within the community and the means to receive it.

Undertake studies among teachers and students to identify the real information needs that exist in the education centers.

Objective 3

To promote connectivity as a means to establish networks among educational institutions and with information centers.

Recommendations

Define actions to create information management networks to strengthen education activities.

Promote connectivity in information system management for determination of risk and early warning.

Civil society and education

Objective 1

To achieve active and permanent participation of civil society so ensure the efficacy of educational efforts.

Recommendations

Strengthen the motivation aspect of education.

Organizations that facilitate the integration of civil society must keep an open mind.

Understand participation and the endeavors of civil society as part of a broad and open system where we all understand we are necessary.

Recognize civil society education as a fundamental pillar in the process of transforming community risk conditions.

Integrate existing and future educational efforts and implement projects that will reach beyond the short term.

Objective 2

To enrich information content with greater projection to civil society.

Recommendations

Incorporate the values that serve as a foundation for risk management— self-esteem, cooperation, social commitment, and collective work—into education and public information.

Facilitate access to information through the channels and language to be used.

Execute social communication and information programs that will contribute knowledge to the community and promote greater commitment.

General comments

The Hemispheric Conference revealed that the development of the education sector in risk reduction has made significant progress in the last decade, although not yet at the levels required by the countries and the hemisphere.

The sector approach of focusing on the disaster and preparedness efforts has been positively broadened by integrating a vision that grants the same level of importance to the reduction of the factors that cause the risk.

From an educational focus in institutions on training to respond to disasters, more interest and concern now centers on training students, broadening their knowledge of risk and personal experience to develop higher levels of awareness and personal and group commitments.

Education programs used to be limited to primary and secondary education; currently the focus is shifting towards higher education, not only in efforts to promote higher levels of knowledge but to create new attitudes, new awareness and greater commitment to reducing risks.

The results obtained from the Conference and the quality and scope of the approaches that were used, not only resulted in an educational product enriched by interdisciplinary and multi-sectoral criteria, but also demonstrated that risk management education is necessary and pertains to all members of society.

The cross-cutting themes at the Conference gave rise to enriching discussions that opened new spaces for discussion on ways to strengthen the education sector. The horizon has expanded for future hemispheric education for risk reduction and new alliances have been forged in a process that is both valuable, necessary, and complex, and thus requires an understanding of the medium and long-term investment that can be expected from an appropriate investment, which may at first appear very expensive, but in terms of the benefits it can yield, will be recognized as the best social investment.

Since education is so complex and the environment in which it can grow and contribute is so broad, the proposals made by the different working groups of the Conference have provided sufficient material to begin to accomplish changes in the countries. However, it should be recognized that some questions were left unanswered and other issues were not dealt with. These are elements of a compound, the educational compound, that should be nurtured by knowledge and existing experience, in order to overcome the challenges posed by the current situations of risk where, unfortunately, human beings have the starring role.

AGRICULTURE, FOOD SECURITY AND NUTRITION²⁷

General

The proposed definition of food security and nutrition is the ability of all persons to enjoy, in a timely and consistent manner, access to the food they need, in the quantity and quality required for adequate consumption and biological utilization, guaranteeing a condition of well-being that fosters sustainable human development.

From the agriculture sector's perspective, risk management can be seen from four different simplified scenarios to gain a better understanding of the complex realities of the sector:

- Forests and protected areas
- Subsistence agriculture
- Traditional commercial agriculture
- Diversified commercial agriculture

Each of these scenarios reacts and responds differently to the effects of disasters.

A risk reduction system is based on community-managed rural and agricultural development that generates wealth and well-being, food security and nutrition, and employment and income through a harmonious relationship among nature, agriculture, and rural society. This system is affected not only by ecological vulnerability but also by economic, technological, productive, social, political and institutional vulnerability. Four factors in this system should add value, and these have been chosen in this document as crosscutting issues (finance, civil society, land use management and information technology).

Nutrition and food vulnerability occur when the relationship among nature, society (its rural spaces, the effects on countries, on regions and on the hemisphere) and agriculture is interrupted, resulting in basic productive vulnerability, which is part of a cycle that includes economic, ecological and social vulnerabilities.

This sectoral vulnerability (endogenous by definition), in general terms, is man-made, resulting from deforestation, poor use of water and land resources, and inadequate cultural and agricultural practices, among other factors. However, these are not the intentional actions of rural inhabitants themselves, but the result of forces such as subsidy-based market distortions, drops in produce prices, the debt burden that hinders the timely arrival of agriculture support, the longstanding institutional weakness that affects agricultural research, development and extension, and, obviously, the absence or incongruence of macro-economic and sectoral policies.

²⁷ Hernán Delgado of the Nutrition Institute for Central America and Panama (INCAP) and Benjamin Jara of the Inter-American Institute for Cooperation in Agriculture prepared the sectoral discussion document and the INCAP team was responsible for coordinating the work group.

Some exogenous factors (hazards) worth mentioning are hurricanes, drought, floods, mudslides, forest fires and volcanic activity.

When the internal (vulnerability) and external (hazards) factors come together, emergency or disaster situations arise, causing direct impacts on the sector such as:

- Losses in food production
- Soil erosion
- Lost or damaged seed stocks and seedlings
- Soil loss
- Reduced productivity caused by too much or too little water
- Loss of water sources
- Death of animals
- Damaged plantations and damaged or altered basic services.

Some indirect effects may include:

- Loss of credit worthiness
- Altered or destroyed livestock production capacity
- Inability to sow new crops
- Reduction in the demand for agricultural inputs
- Interruption of market access
- Price increases, especially in basic food products
- Increase in traditional agriculture unemployment

In turn, these have a secondary effect on the overall economy, namely:

- Use of extraordinary funds the government has earmarked for emergencies
- Reduction of government income due to fewer taxes paid by the affected populations
- Damage to financial sector due to non-payment of credits, mainly in the agrarian sector
- Shortage of manpower when local inhabitants migrate after a disaster
- Damage to underwriters forced to pay extraordinary sums
- Less revenue from exports, and increased costs for imports of food and other necessary materials
- Increased unemployment
- Fewer services under contract, such as mechanized agriculture
- Distorted trade balance and fewer international reserves in the countries
- Fewer investments
- Reduced savings capacity

An ECLAC survey on the effects and impact of disasters from 1972 to 2001 indicates that the loss of lives, the number of persons affected and all direct damages add up to \$28 billion. The biggest percentage of these losses, in relative weight and in absolute terms, was in the agriculture sector.

Asia is the region most affected by disasters, followed by Latin America and the Caribbean. Most damages occur in rural areas, most notably in the agricultural sector, representing

39% of the losses. Losses from water-related events, namely hurricanes, such as Hurricane Mitch, drought, and floods, rose to 48%. Hurricane Mitch caused US\$6 billion in losses, half of which was experienced in the agricultural sector of Honduras, Nicaragua, El Salvador and Guatemala. Losses related to El Niño exceeded US\$470 million, mostly related to subsistence agriculture and, consequently, food security and nutrition.

Disasters certainly do not occur in homogeneous populations. Too many people live in precarious conditions throughout the Americas and are on the verge of definitive migration. These people live in true ecological niches, in certain areas, with inadequate food, undervalued labor, no production of goods and with evident acute clinical malnutrition. The segments most affected are women, children, migrants and peasants. Some segments of the population live in permanent emergency situations, others are somewhat protected while the labor force attains higher value upon reaching the corresponding development level.

The definition of food security and nutrition provided above may appear long and complex. It can be broken down into four basic elements: availability, accessibility, consumption and biological utilization of food products, while preserving a sustainable environment and fostering integrated human development. Aside from the assistance provided in the region, additional attention must be paid to prevention and promotion, focusing on the basic underlying causes of food and nutrition insecurity.

When analyzing the magnitude, complexity, and trends of nutrition and food problems in the region, the current obstacles and opportunities, and the greater awareness of the effects of good nutrition on health, well-being, productivity and development of individuals, a Central American food security and nutrition initiative is vital for the operational and conceptual development of solutions to this issue. A regional food security and nutrition strategy is based on two key strategic principles related to:

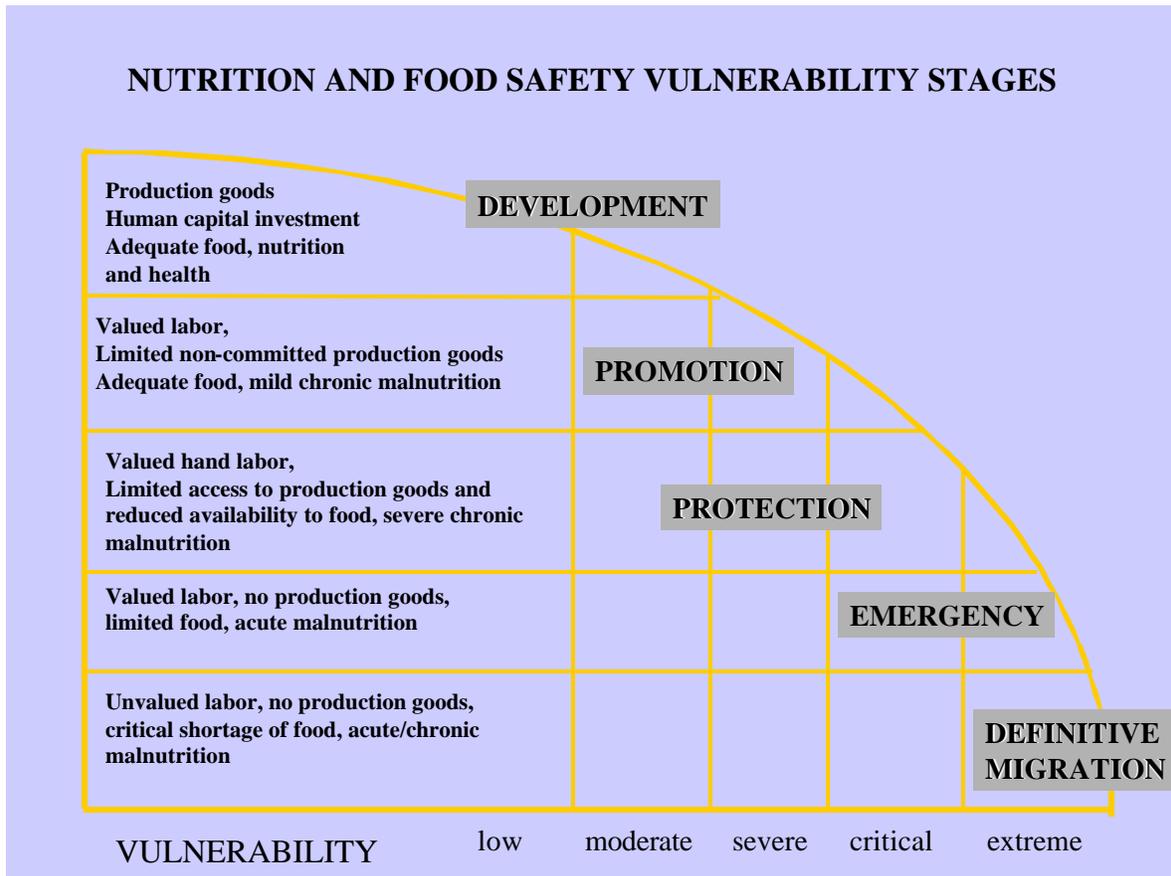
- A change in focus of the explanation of food and nutrition problems and its causes.
- Food security and nutrition as the objective, policy and strategy for regional, national and local-municipal development.

The strategy includes a holistic conceptualization of the food and nutrition issue. An integrated approach seeks to strengthen the process to change the quality of life of the inhabitants as a requirement for development, focusing on prevention and on promoting human development and adequate nutrition. This will result in new organizational models, new roles, decisions and steps to improve the situation; in other words, new ways of “thinking and doing” in matters of nutrition and food.

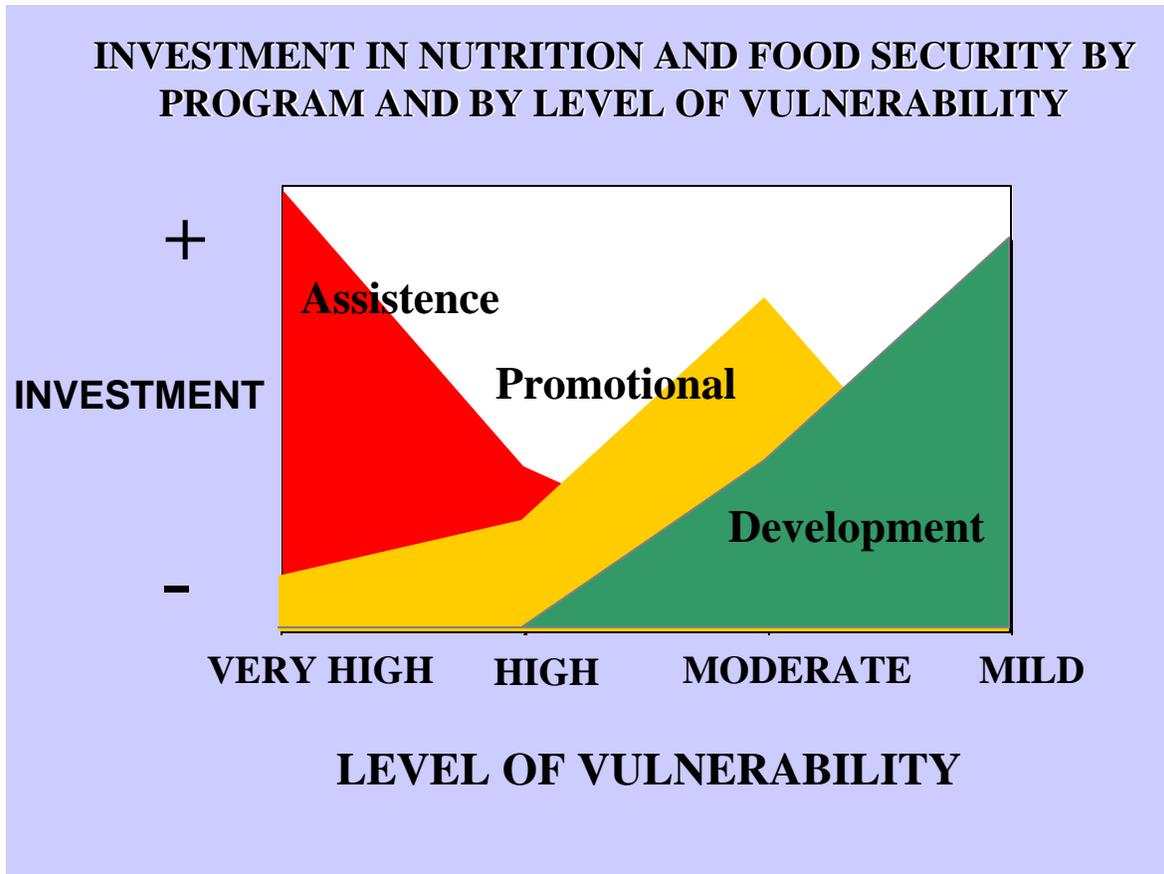
Food security and nutrition have different vulnerabilities, ranging from very low to extreme vulnerability, as occurs with the definitive migration group. Peasant families have managed to develop their own survival strategies to overcome nutrition and food insecurity caused by inadequate access to food. External factors of an environmental, economic, and social nature may lead families to use offset mechanisms. This occurs in cases of drought, floods and other situations that trigger hunger or famine.

Some extreme situations are now being reported. The ecological damage observed is such that the productive potential of the land has almost disappeared.

The proposed paradigm aims to reduce the number of persons living in extreme poverty or in extreme vulnerability (hunger and malnutrition), and to adequately prevent the adverse effects of disasters.



Different levels of investment are appropriate depending on the vulnerability and level of nutrition and food insecurity—from very high, high, moderate to low. An investment for assistance will obviously be justified in situations of very high vulnerability, as has been the case in Central America in recent months, where chronic malnutrition has become acute due to drought and poor coffee production. In fact, once again there have been cases of Kwashiorkor-type malnutrition or marasmus, which had almost disappeared.



Areas of intervention

Concerning food security and nutrition, the member countries participating in the Meeting of the Health Sector of Central America and the Dominican Republic (Reunión del Sector Salud de Centroamérica y República Dominicana) (RESSCAD) recognize the importance of strengthening the food and nutrition initiative to mitigate the effects of poverty on health, nutrition and human development in the sub-region.

The disaster-related framework of action for this sector arises from the mandate of the Summit of the Americas. Food vulnerability particularly fits the mandate issued by the Inter-American Board of Agriculture during its last meeting in Punta Cana, Dominican Republic, which resolved to:

- Assign a high priority to national food security, safety and quality policies, and
- Reduce the negative effects of natural and external events using disaster prevention and mitigation policies, fostering solidarity support programs, special commercial considerations, technical assistance and other forms of support, especially for smaller economies.

This document attempts to follow up on the mandates of the Third Summit to reduce the vulnerability of countries to natural disasters.

After the 20th Central American Summit in October 1990, this meant adopting the Strategic Framework for the Reduction of Vulnerability and Disasters in Central America. The Central American Agricultural Council (Consejo Agropecuario Centroamericano) (CAC) developed the Agriculture Vulnerability Reduction Program in the Face of Climate Change (Proyecto de Reducción de la Vulnerabilidad del Sector Agropecuario ante las Alteraciones Climáticas) created the Central American Climate Forum and strengthened regional coordination. Finally CEPREDENAC and the CAC itself have created the Regional Agriculture Program for the Reduction of Vulnerability to Disasters (Programa Regional del Sector Agropecuario para la Reducción de la Vulnerabilidad de Desastres). Additionally, CEPREDENAC and the Nutrition Institute for Central America and Panama (Instituto de Nutrición de Centro América y Panamá) (INCAP/PAHO) are helping these countries develop a regional nutrition sector disaster reduction program.

What elements should a risk reduction strategy contain? The basis must be national, with a regional focus, but the latter should not substitute the former. Actions could include:

- Strive for a regional distribution of tasks
- Take advantage of regional and international cooperation
- Foster and strengthen strategic alliances with the public and private sectors, civil society, development organizations, media, etc
- Encourage horizontal cooperation and exchange of experiences among countries
- Promote regional development, building on existing capabilities and jointly seeking new opportunities, striving for the better planning, convergence and integration of initiatives and courses of action
- Solve transnational issues (such as pests and diseases that span national borders)
- Add value and attain economies of scale
- Facilitate inter-regional coordination
- Avoid duplication of efforts, as commonly occurs when expected complementary actions are not adequately coordinated

One strength in the sector is a framework of action resulting from the mandates emanating from the Summit of the Americas, that assigns a high priority to its policies and fosters disaster prevention and mitigation policies. Member countries of RESSCAD recognize the importance of strengthening the food security and nutrition initiative as a strategy to reduce vulnerability, among others, to natural disasters.

A vicious circle is observed in disaster situations: the disaster causes food insecurity; those facing nutrition and food insecurity become more vulnerable to disasters; which in turn leads to higher poverty indices and thus, greater vulnerability.

Disasters usually cause more damage under conditions of nutrition and food insecurity. Food insecurity is responsible for higher morbidity and mortality, slower physical growth, weight loss, learning disabilities, and low productivity, all of this resulting in human underdevelopment.

Changes in production systems have made people more vulnerable to food insecurity. Limited government assistance is another cause, and civil society entities, especially non-governmental organizations, can seldom fill the void resulting from the globalization paradigm shift.

Group discussion

Finance and food security

Objective

To create awareness among decision-makers of institutions responsible for food security and the financial sector so as to better fund nutrition and food programs and thereby decrease vulnerability.

General comments

The problem of food insecurity is structural and requires changing the focus of relevant integrated and multi-sectoral policies.

To date, investments have been aimed at non-structural matters, stressing prevention, and responding to the causes, not the effects, of insecurity.

Institutional recommendations

To include food security and nutrition on the agendas of international meetings, like this one, and in the discussions of politicians and decision-makers at the regional, sub-regional and national levels, to create a favorable climate for preparing food security policies, plans and programs, with a multi-sectoral and multi-disciplinary approach, as a strategy to reduce risk.

To develop a strategy that involves comprehensive policies to enhance food security, based on institutional strengthening, therefore attacking causes as well as effects.

To create a network of national private and public institutions and cooperation agencies involved in nutrition and food matters, to exchange experiences and information, and to optimize the use of financial and non-financial resources in favor of food security.

To create a Hemispheric Permanent Forum for Food Security and Nutrition and Agriculture to reduce vulnerability of the populations.

Technical-economic recommendations

To analyze the causes, risks, and the time and area distribution of food insecurity and nutritional vulnerability, to identify intervention and funding priorities.

To extend the emphasis given to food production and availability to three other links of the agri-food chain involved in nutritional vulnerability: access, consumption and biological utilization of food.

To tap diverse internal funding sources, such as transfers from the central government to local governments, use of local government resources, sectoral national funds, social funds, municipal funds, etc.

To study market behavior in the face of disasters, to reduce the risk of supply shortages or excessively high prices, and access issues (e.g.: less income due to unemployment, high prices hindering access to food, etc.).

To study the effects of disasters on resources such as water and soil (erosion), the effect on the well-being and productivity of growers.

Since structural changes are slow to occur and have medium-term effects, resources must be mobilized to increase the demand capacity and promote competitive production and risk reduction measures.

Financial Recommendations

Publicize, integrate, promote and request the funds available to support recovery of food security.

Incorporate the notion of insurance and private sector participation into the debate.

Raise awareness among national decision-makers and international cooperation agencies to redirect available resources towards food security and nutrition, as one way to reduce vulnerability.

Promote funding instruments for the most vulnerable sectors (micro-credits, revolving funds, etc.).

Land use management and food security

Objectives

To identify specific actions for the food security sector that link vulnerability reduction to land use, and with land use management processes and products.

To define the potential of certain technologies and eco-technologies for production, storage, and distribution of food to reduce vulnerability of the food security sector regarding land use and land use management.

To define and establish coordination mechanisms that favor including risk reduction in all plans, programs and sectoral development plans, land use and land use management.

Recommendations

Identify and discuss successful experiences in the region related to adequate land use, risk reduction and land use management plans for the food security sector.

Define vulnerability reduction strategies and strengthen the response capacity of national and regional institutions related to food security and land use by means of organization, awareness and training efforts.

Develop an information system, including Early Warning Systems (EWS), to support decision-making in matters of food security risk reduction, including land use and land use management in the event of disasters, and even hazards coming from the sector itself.

Promote research and development, adaptation and transfer of appropriate technologies and eco-technologies that favor implementing more environment-friendly practices, considering risk management (such as suitable crops for a given geographic area, land use, land use management).

Develop risk management public policies for the food security sector, including land use and land use management, fostering the necessary articulation among central governments, local governments and organizations of civil society.

Analyze the growing vulnerability of the food security sector to socio-natural hazards resulting from extensive agricultural and farming practices, forest destruction, soil erosion, more hillside plantations without adequate management, among others.

Define the requirements of regional-, national- and local-scale vulnerability mapping specifically related to food security.

Other technical recommendations or measures, by productive system, include:

- Substitute fragile crops with more resistant crops
- Cease planting in vulnerable areas
- Use market intelligence to inform growers on price and market behavior
- Adjust crop scheduling
- Create fire-fighting teams
- Maintain reserves of animal feed inputs
- Monitor and predict epidemics based on the behavior of pests and diseases
- Clean drainage ditches and dikes in rural areas

Information technology and food security

Comment

State-of-the-art technology is important to reduce food security and agriculture imbalances among different populations. Modern technology and connectivity can provide access for marginalized populations to extensive information and information technology.

Recommendations

Guarantee valid and reliable data on structural determining factors, such as availability of food, access to food products, consumption and adequate biological utilization, and other food insecurity factors. For decision-making purposes, it is vital to have information on the vulnerability of inhabitants resulting from their geographic location and functional groups. New information technologies must be used to provide early warning and to develop medium- and long-term planning for local and central governments.

Establish communication networks to favor the exchange of experiences in communities and countries related to strengthening food security.

Civil society and food security

Observations

Civil society has historically participated in building food security and must be considered holistically.

Food security is the solution to the vulnerability suffered by communities with very high levels of poverty and low levels of education and development.

We must be able to put forth a proposal where food security is guaranteed and is considered a government policy matter, with the participation of all.

Acknowledging the absence of representative entities and civil society in this Conference, we recommend promoting and ensuring the active and representative participation of all components of civil society in future conferences that deal specifically with food security.

Civil society plays a leading role in efforts to promote food security, and therefore, an appropriate legal framework is required to foster their true and representative participation, and to develop actions that:

- Base the framework locally
- Generate information to promote participation
- Develop capacity-building strategies to ensure true and representative participation
- Seek opportunities with the banking system, civil society, donors and others
- Build partnerships in areas of common interest, partnerships between the social and productive sectors
- Empower civil society
- Seek mechanisms and actions to propose change and jointly strengthen food security and nutrition
- Generate communication channels and dialogue among different sectors of society

Sustainability of food security will only be attained with the true and representative participation of civil society.

Recognizing the diversity of civil society in the hemisphere, actions are required to systematize, visualize and disseminate experiences in which civil society has participated in development-related decision-making processes and in efforts to promote food security. This would be a valuable contribution to regional, national or local decision-making in similar situations.

The true sense of civil society participation in such matters as reducing the vulnerability of the health sector, critical facilities, education and food security is to be part of the process, to use and transform technical data and work with the government and cooperation agencies to develop synergies.

Civil society is a key actor without which the design and implementation of successful policies would be impossible in areas such as health, education, facilities and food security.

The role of multilateral entities and cooperation agencies should be to strengthen autonomous, self-management capacity and to generate self-organization mechanisms to promote development and growth. This would result in inter-institutional and interdisciplinary joint efforts between the state and civil society, focusing on human development and sustainable development.

Building food security is one solution to reducing the vulnerability to disasters of poorer communities, with a lesser level of education and development.

A proposal is required to guarantee food security and to ensure it is on the political agenda, with the participation of all parties.

Recommendations

Create advocacy committees to manage risk prevention.

Involve civil society in early warning systems to enhance effective implementation.

Encourage cooperation agencies and governments to provide opportunities for different sectors of the civil society in the Americas to meet and exchange success stories and collaborate.

Identify ways to ensure food security among the populations that are marginalized or at a disadvantage concerning local food production, and who are forced to use other strategies to survive, especially during and after disasters (e.g., countries with high levels of violence, marginalized communities, etc.)

Identify and promote experiences with donors that have developed innovative ways to strengthen local capacity related to project management and execution.

Identify experiences and lessons learned that foster credibility and new attitudes among the cooperation community and representatives of civil society capable of becoming organized, of taking ownership over processes, and demonstrating the transparent use of resources.

CRITICAL FACILITIES²⁸

General

Critical services²⁹ are defined as those that must be provided immediately before, during and after an emergency. These services are required to carry out activities in society and, in the current context of “sustainable cities,” are a priority in order to achieve sustainable processes of economic and social integration. Citizen health and the evolution of daily life are seriously compromised when these vital services are negatively affected. This is key to understanding and rendering these services that, unfortunately, are scarcely integrated. Few of them, if any, include risk in planning and management, further affecting vulnerability.

The loss of strategic infrastructure due to disasters in the last few years has begun a process of analysis of their vulnerability. Infrastructure funding agencies are including the risk variable in pre-feasibility studies of investment projects.

Areas of intervention

Significant progress has been made by including innovative parameters to assess vulnerability, especially a new approach to “vulnerability of structures,” instead of the traditional concept of analyzing physical weaknesses resulting from structural factors and location. Different types of analyses and indicators are used to interpret and measure risk based on:

- Physical vulnerability
- Economic vulnerability
- Financial vulnerability

Physical risk and vulnerability

Traditionally, only physical risk assessment methodologies and procedures have been used. Disaster-related losses have been calculated based on their direct impact: meters of networks lost, kilometers of roadways damaged, and number of bridges damaged; that is, a physical quantification of damaged infrastructure.

Therefore, vulnerability has been measured as the likelihood of suffering damage due to structural characteristics and the level of exposure to a given hazard.

However, indirect consequences exacerbate the effects of a disaster. Oftentimes, a damaged bridge may interrupt or hinder social and economic integration, to the point of compromising international or regional trade treaties. This is even worse when put in the context of globalization.

²⁸ Stephen Bender of the Organization of American States (OAS) prepared the sectoral discussion document and the OAS team was responsible for coordinating the work group.

²⁹ Although this sector consists of the water and sanitation sub-sector (among others), this topic is not covered here, but is discussed in detail in the previous chapter on health, water and sanitation.

In any case, only by reducing physical vulnerability will the economic and financial risk be minimized. The efficiency and operation of critical infrastructure will be better ensured by strengthening the safety of these structures, preparing them to better respond before, during and after a disaster. Therefore, the risk variable must be part of the management of these services, either private or public.

Economic risk and vulnerability

Economic risk is closely related to physical and financial risk. Economic development processes that do not account for risk may undermine their sustainability, and the strategic development of critical services would engender significant uncertainty.

Undoubtedly, the general public understands the concept of economic risk, that is, the connection between the physical and the financial risks, because these reflect the indirect consequences of disasters. Perhaps an enterprise suffering losses from a disaster may receive compensation for such losses, but if this company decides not to replace the damaged components, the population will suffer that additional impact.

Oftentimes, regional economies and subsistence economies of poorer regions depend on the presence and operation of infrastructure, namely communications, utilities, and transportation. Here, total or partial damage to these services may trigger the destabilization of the economic structure.

In broader terms, damage to productive infrastructure can bring about an interruption in the chain of payments, collections, the balance of payments, and may even impact productive systems. Such losses could subsequently impact political-economic development processes in the region.

Financial risk and vulnerability

Many people believe that the biggest concern of telecommunications, energy and transportation owners or managers is the financial statement, especially if they are in the process of or have completed privatization. Despite the damage or destruction of their physical infrastructure, if company and sub-sector numbers are “in the red,” financial resources are available to offset any losses that owners and operators might experience. Vulnerability to financial risk, in general, is monitored and reported.

The fact that credit agencies continue to fund vulnerable projects inhibits the reduction of vulnerability in strategic services. The question regarding who is responsible for financing vulnerability reduction remains unanswered. In their search for economic benefits, operators believe that it is more important to offer the services, and that investing in risk reduction is not profitable.

Building a culture of prevention in the delivery, operation and planning of vital services is affected by the following concept:

investment versus risk reduction

Likewise, these services should be inexpensive, reliable and competitive enough to support the efforts of social and economic integration.

General context

In the 1990s, Latin America began to privatize traditionally state-operated high-cost, low-efficiency services. This process, which has occurred in such services as telecommunications, energy, and highways, etc, continues forward in different ways according to sector and country.

Privatization has been based on the search for efficient, quality and competitive services and on the defense of user rights, which are parameters defined in service concession contracts and audited by government-related regulatory entities.

In this process, the priority of private service providers is the search for profitability. The purely commercial concept behind this is to optimize benefits with the minimum investment. The minimum service-rendering parameters and the goals of the operating and expansion plans are adjusted.

To this effect, most privatization processes foresee the inclusion of technical conditions – product and service quality parameters - but have not considered reducing service vulnerability. Consequently, there is still no answer as to who will assume the cost of risk reduction.

However, the standard may be changed or adapted to include prevention-related guidelines in the operation and management of services, improving the safety not only of the infrastructure but also of the inhabitants served. It is necessary to raise awareness among regulators, providers and financing entities, as well as an inter-sectoral vision and action.

Once again, the key to advance risk reduction is to include risk management in development strategies.

Some companies have begun to perform vulnerability assessments. However, these have been quite conservative because they do not account for indirect and secondary losses. The same situation arises when conducting post-disaster loss assessments, particularly losses suffered by the poorest people and countries of the hemisphere.

Sub-sector details

Several questions arise in the *telecommunications sub-sector*: Is the hemisphere in transformation? Who is the owner or the operator? Literally, there are hundreds of

circumstances. There are no fora in which to discuss the vulnerability of the telecommunications sub-sector to natural disasters, other than among a company's Board of Directors, be it private or public. The Board generally discusses what to invest in and the risk of not recovering investments. Regrettably, vulnerability to natural disasters is not a top priority. There are, however, a few examples, not well reported as a result of competition, in which certain telecommunications companies have improved or strengthened their ability to deliver a product and a service. In most cases, nevertheless, these efforts have not focused on reducing the vulnerability of the telecommunications sector in the hemisphere.

The *energy sub-sector* shares many characteristics of the public-private transformation of the telecommunications sub-sector, with diverse and complicated owner-operator combinations. Central America has several examples of vulnerability inventories of energy-related infrastructure. Even in that region, however, it is difficult to sell the notion of investments and vulnerability reduction to directors of the energy sub-sector in face of national, regional and global competition. Experts in the region may provide consultancies, both in energy and in telecommunications. However, there is still no forum or agenda for criteria or standards for the energy sub-sector in the face of societal needs and economic demands related to natural disasters.

Lastly, the *transportation sub-sector* does have an incipient forum and agenda. A meeting of Ministers of Transportation of the Americas was held in New Orleans in December 1998 to discuss the creation of a western hemisphere integrated transportation system. Such a system should support the notion of strengthening economic and social development, trade, tourism, and cooperation within the region, and should also support the participation and equitable distribution among member states of the benefits resulting from this integrated transportation system. With these objectives in mind, the Ministers agreed to revitalize the Western Hemisphere Transportation Initiative (WHTI). The Government of Canada currently holds the Executive Secretariat. Among its lines of action, WHTI has a Disaster Response Plan developed from an analysis of the implications related to the loss of essential transportation infrastructure from meteorological or other phenomena. The Plan also discusses the impact of post-disaster relief efforts and the need to reconstruct infrastructure to help economic recovery so as to respond more efficiently to regional or sub-regional meteorological and other catastrophes.

This initiative crystallizes one of the main objectives set out in the decade, namely to incorporate governments and funding agencies in vulnerability reduction efforts. This pointed to how the construction or reduction of risk constitutes an important step towards increasing the safety of transportation corridors.

WHTI plans to annually inform the relevant body, as may be determined by the OAS General Assembly, about progress made in reducing the vulnerability of the transportation sub-sector to natural hazards. Advances have been made at the political level, changing the budgets of one or another ministry of transportation in an OAS member country. There are examples of road, seaport and airport vulnerability assessments. Additionally, there are new combinations of public-private ownership and operation.

The Unit on Sustainable Development and Environment (USDE) has been supporting WHTI efforts to help member countries work together to prevent natural disasters and environmental incidents that affect transportation and to improve disaster response.

Another USDE effort was the development the Central American Vulnerability Reduction Project for the Transportation Sector, with the financial support of the Emergency Transportation Office (ETO) of the United States Department of Transportation (USDOT). The project consists of the following three elements:

- Vulnerability Reduction Assessment for the Pan-American Highway and its Alternate Corridors
- Document on Mutual Assistance Mechanisms in the Event of Damage to Transportation Components in Central America
- Training Course on the Use of Natural Hazard Data in the Development and Assessment of Investment Projects for the Transportation Sector

Other sectoral strengths include:

- The energy sub-sector is fundamental due to the value added (transformation) that may be given to products coming from the corridor of influence in a given region. Competitive processing and further regional development strongly depend on the availability of energy.
- The OAS, with the support of the Inter-American Integrated Development Council (IIDC) has fostered the creation of the PROCORREDOR consortium, to provide research and training to reduce the vulnerability of commercial corridors to natural hazards. This is a forum of discussion, training and reflection to generate and transfer methodologies and to advise governments and particularly the transportation sub-sector on the vulnerability of these components, as well as on strategies to increase its security, efficiency and competitiveness in risk reduction.
- Worth noting are policies of international private enterprises with a longstanding participation in the energy sector, that have implemented vulnerability reduction programs in their facilities worldwide, to deal with natural hazards such as earthquakes, storms, floods, icebergs (in the case of oil rigs), landslides, etc.

Despite this progress, there continue to be weaknesses in the critical service sector. In the Americas, and particularly in Central America, earthquakes, floods, and hurricanes significantly damage strategic infrastructure like highways, water, telecommunications and power distribution systems. In addition to the serious short-term implications, re-building this infrastructure usually requires a long period of time and budget funds earmarked for development. Sometimes reconstruction occurs under the same conditions of risk as before, thereby increasing the vulnerability of the population. During this period, the entire economy and the most affected sectors operate under abnormal conditions, aggravating the initial impact of the disaster and deteriorating socio-economic conditions.

Reconstruction costs include the effects of a slowdown on the affected productive sectors, and the impact on the overall national growth and development.

Important levels of vulnerability

“*Regulatory vulnerability*” causes a two-fold shortfall: current conditions do not allow for the implementation of risk reduction programs, and there are no regulations that foresee actions during emergencies. Crises arise not only from the event itself but also from management or mismanagement problems that might foster speculation, worsening the impact.

The energy sub-sector is a sort of benchmark for institutional and regulatory vulnerability. MERCOSUR has developed protocols with guidelines for the bi-national integration of Argentina and Chile. However, they do not explicitly include norms or measures to reduce sectoral vulnerability.

The complex relationship between energy-sector owners and operators was already discussed, as well as the difficulty of promoting investments and vulnerability reduction.

Physical and financial losses are highlighted, separate from economic losses, which include indirect and secondary losses particularly suffered by the poorer persons and countries of the hemisphere.

Vulnerability to natural hazards is not a top priority in the telecommunications sector. As is the case in the energy sub-sector, there are not fora in which to discuss vulnerability to natural hazards other than a company’s Board of Directors, either private or public.

Lack of information: another cause for increased risk

Understanding risk processes and identifying hazards to vulnerability of strategic infrastructure is closely related to understanding the natural surroundings, populations affected, demands of the economic structure, and the characteristics of the services themselves.

The level of understanding only relates to the possibility of managing the information and this poses a particular problem for each sub-sector. However, there are common issues that hinder adequate management lowering the level of uncertainty regarding the following:

- Strategic service providers do not generate information, particularly risk maps. Therefore, data-producing entities must make a concerted effort to provide more information.
- It is possible that necessary information is not available, is classified or restricted, is not shared openly among institutions, or is very costly, even though it is public information. The absence of information standards and uniform criteria to deal with and weigh variables is another limitation for organizations to exchange information. Often, large

amounts of data exist but cannot be used for analysis because they are not considered information.

- The information available might not be in an appropriate format to assess vulnerability or might not be applicable to the scales adapted for the systems.
- Existing information may be unknown, scarcely disseminated or not properly classified.
- Accurate and detailed analyses using geographic information systems are extremely costly, limiting the scope of their application.
- All parties involved should participate in developing the agenda, matching user needs with the ability of suppliers to meet them. Technicians and scientists should not define user needs.
- Concerning information on natural hazards, scattered information may be found on some factors that condition the hazard level, but there is no hazard or multiple-hazard mapping. For example, there might be information on ground water, soils, permeability and climate, but there is no way to integrate all of this to produce a summarized hazard/risk map. In addition, if there is any information available, it is quite difficult to access.

The education systems in our countries have made substantial efforts, especially in areas such as prevention, mitigation, and preparedness, but much more needs to be done.

Group discussion

The discussion focused around the current existence of a framework to facilitate reducing the vulnerability of strategic facilities:

- International organizations such as the OAS and PAHO are heading hemispheric or pan-American initiatives to reduce the vulnerability of essential services.
- Methodologies have been developed to analyze the vulnerability of critical services.
- Progress has been made defining risk levels.
- Hazards and their potential impacts on critical services have been characterized.
- Discussion fora have been created to deal with the vulnerability of vital services throughout the hemisphere.
- The transformation process (from public to private) brings an opportunity to incorporate and reduce risk.
- Governments and funding entities have developed initiatives to reduce the vulnerability of these sectors.

- The magnitude of infrastructure losses has led assistance organizations to reflect on the need to avoid recreating risks during the reconstruction process.

Finance and critical facilities

Objective

To determine an agenda for decision makers in institutions responsible for critical services and in the financial sector to establish common actions to promote funding and mitigation activities.

General comments

The first step in this effort is to identify the entities responsible for risk management and vulnerability reduction. Decision-makers must also be identified, such as the ministers of finance and planning (to define investment priorities), sectoral ministers (to implement projects), the National Risk Management Systems, and local governments (as land managers, to implement the main investments). Their umbrella state policy should aim to improve the security conditions and increase the sustainability of development projects. Each of these institutions should establish responsibilities, attributes and capacities, both in vulnerability reduction and in development actions.

Users and service providers should not be ignored. These are involved protagonists, contractors and consultants, responsible for developing technically viable and economically feasible projects. Another important participant is the financial sector, represented by banks and insurance agencies responsible for crystallizing projects and for facilitating access to development.

Technical-economic recommendations

Design and promote instruments (standards, codes, certification, training and other elements required for risk management) that guarantee the quality and maintenance of works.

Pay proper attention to external investment factors that may have adverse effects on another sub-sector, in other words, understand the indirect impacts. In the absence of joint efforts, the benefits of a project carried out in one specific sector may imply difficulties in another. Different modes of management must be considered when classifying and quantifying supply and demand, to then define an integrated picture. The thresholds of each sub-sector must be clearly defined to not harm the interests of other sub-sectors. The strategies must ensure that each sub-sector can access the benefits, reducing undesired impacts and optimizing investments.

Promote transparency through the bidding process with certified firms.

Recommendations on financial instruments

Consider risk transfer by insuring private and public infrastructure, including services.

Begin a dialogue with insurance companies to understand, measure and assess risks from the exposure of strategic services to natural hazards. Generate an insurance market linked to service operators and, particularly, to users, since the effects are felt in the economic and social arenas, jeopardizing public health. The emphasis should not be only on the infrastructure (systems) but on processes related to the availability of vital services.

Consider establishing special funds, when risk cannot be shifted to the insurance markets. An example could be the Colombian and Mexican calamity funds.

Regulate the reconstruction processes and conditions of facilities destroyed by disasters. Norms and standards are required to strengthen vital services so that they better face natural hazards, and avoid reconstruction that repeats the pre-existing risk conditions.

Ensure effective risk reduction regulations (insurance).

Foster prevention instead of indebtedness after a disaster. Training is required for officers of entities responsible for privatizing and operating strategic services.

Land use management and critical facilities

Objective

To design an agenda for institutions responsible for land use management (local governments, urban planning units, experts in urban management, official community development organizations, etc.) to reduce the vulnerability of water, sewage, telecommunications, transportation and energy services to natural hazards.

Comments

Critical services must be permanently guaranteed for communities, in recognition of their vulnerability.

Risk management training must be accompanied by effective programs, so that trainees can apply the lessons learned.

There is a direct connection between land use management and critical services.

Recommendations

Analyze the trends in each territory and their risk scenario in the context of globalization.

Create incentives for institutions dealing with vulnerability reduction, such as the opportunity to learn new risk reduction techniques and participate in the planning process.

Apply rates consistent with the real cost of the service (fair rates).

Create incentives for institutions to decrease vulnerability.

Include the rural sector and the dispersed population in the land use management process.

Complement risk management training with effective, enforceable programs.

Teach technicians how to sell ideas to politicians.

Include sanitary landfills and final waste disposal as part of critical service management.

Revise technical and administrative regulations and legislation, adjust them to current needs, and align them with risk management.

Train the human resources responsible for critical services. Include risk and hazard management in the education system, and adopt prevention and preparedness measures.

Ensure participation of the private sector and reduce political influence in technical decision-making.

Information technology and critical facilities

Objective

To design an agenda to foster using information technology to provide services such as potable water and sanitation, telecommunications, transportation and energy, to reduce the vulnerability of infrastructure components, and to provide decision-makers with information and strategies for integrated information networks.

General comments

Information technology, in itself, is a critical service (information infrastructure). Since many IT systems can significantly help reduce vulnerability (GIS, GPS, cellular telephony, etc.), these are considered critical services. The vulnerability of information technology is determined by the vulnerability of the telecommunications sub-sector, which in turn is determined by the vulnerability of the energy sub-sector.

Technology by itself cannot be the focus of attention in vulnerability reduction efforts. Real needs must be identified at the local and community levels. Once the problems are identified, the required technical solution and related technology may be identified.

The physical vulnerability of the energy and telecommunications sub-sectors must be reduced for information to flow. The possibility to exchange and manage information depends on how vulnerable the telecommunications infrastructure may be. Consequently,

further investments are required to strengthen information technology-based disaster prevention systems.

Another vulnerable element is the information structure; that is, formats and management standards, data production, and parameter setting. This is a significant limiting factor since each company or state entity invests its own resources to individually produce and acquire information or set up geographical information systems, yet there are no common criteria to guarantee information migration or to pool investments in information.

This discussion generated two conclusions:

- Critical information must be gathered for analysis and modeling. For this information to be standardized, specialists in services, risk, and information management must all participate in order to determine the standards and parameters with variable criteria.
- Technology must meet the standards of user-friendly, reliable, available and adaptable in order to be used for vulnerability assessment. Information on hazards and risk levels, generated by experts, must be distinct from information on vulnerability. Technology should favor this combination of factors, information generation, migration, feedback and development of search engines.

Recommendations

Concerning the transfer of critical services from public to private management, the following was highlighted:

- Private critical service operators must invest in vulnerability reduction in order to offer quality and efficient management.
- The objectives of private operators must match those of emergency management and response entities. High investments costs show the need to jointly set priorities.
- Critical service providers (companies or organizations) must build partnerships with hazard monitoring entities and emergency management and response entities.
- Physical vulnerability of infrastructure and sub-sectoral functionality must be analyzed, as well as external factors resulting from the potential damage to strategic infrastructure.
- Standardized common, or at least comparable, vulnerability indicators must be determined, requiring a concerted strategy based on inter-institutional efforts.
- Indicators must be shared down with the municipal administration in order to apply risk-focused services and land management at a more local level to mitigate vulnerability. To do this, a culture of prevention must be developed and decision-making must include the risk variable.

Concerning information:

- Information is relevant to identify vulnerabilities and estimate magnitude. The variables that create hazards and vulnerability must be defined.
- Hazard-related information must be very detailed to help develop Multiple Hazard Maps (MHM). In order to assess vulnerability, the threat must be identified and characterized. Hazard monitoring is fundamental to recognize changes in the level of vulnerability, particularly of persons.
- The information used to characterize hazards and to perform detailed analyses must be available on scales appropriate for micro- and medium level studies.
- A culture must be developed to gather, maintain and exchange information locally.

Concerning the exchange and integration of information:

- Databases with different levels of detail must be developed. All information cannot be centralized. Projects exist to create national and regional information infrastructure so as to minimize duplication and maximize exchange.
- Information must be decentralized to be shared at the local municipal level.
- Standard formats and methodologies are required to facilitate information exchange.
- Information must be located, classified and ordered (meta databases).
- Strategies must be developed to transfer risk-related information to the communities. Inadequate information dissemination could have negative consequences, even affecting property value.
- The use of public information for commercial purposes must be controlled.
- The vulnerability of institutions that generate, own and manage relevant basic information must be reduced. These entities should have a minimum budget guaranteed to promote open exchange instead of restricting its use.

Concerning technology:

- The existing networks of information must be revised and expanded (Pan-American and hemispheric networks) to document and systematize hazard monitoring, vulnerability assessment, vulnerability reduction projects, national approaches, national and regional problems, solutions implemented, lessons learned, shortcomings, etc. This will help produce a diagnosis of the current conditions.
- Workshops and meetings must be held with specialists from the different sub-sectors of the critical service sector, and with scientists, technicians, IT management entities, local

governments, infrastructure operators, and private enterprise to interchange knowledge and better define the reality and the problems for the next 18 months and two years, regionally.

Civil society and critical facilities

Objective

To develop an agenda of actions specific to civil society (NGOs, PVOs, private sector, etc.) to promote, guarantee and improve their participation in reducing the vulnerability of such services as water, sanitation, telecommunications, transportation, and energy, reduce the risk conditions in development processes, and increase the safety, efficiency and continuity of these services.

General comments

This last decade has been strategic to assess the role of society in risk management. Training programs and community awareness have been pillars of vulnerability reduction strategies. The objective has been to improve the ability to respond, and to improve the conditions to adapt to risk, so as to lower the levels of social vulnerability.

Civil society must participate in risk identification and must be able to access risk and hazard related information generated by specialized entities. If people are interested in learning about potential risks to their safety, then they are also interested in reducing those risk and uncertainty.

Private enterprise and cooperation entities may participate in funding the construction of facilities that exhibit high levels of safety and security.

The ability of civil society to reduce vulnerability plays a fundamental role. Either at the formal or informal level, the primary objective is to have safer services and cities, based on sector-specific programs. Society must understand the potential impacts before it can adequately demand protection. Service providers and regulators must receive training to adjust service management to existing dangers and be able to make changes to operating, maintenance and expansion plans. Company development plans must include technical and institutional strategies, among others.

Projects must be consulted with civil society. Programs that provide for community input are stronger. An exercise like this requires educating citizens on community vulnerability reduction.

Popular consultation and local referendums through direct democratic consultation are important strategies and methods to involve civil society and create a sense of ownership. A key to the success of vulnerability reduction projects is for civil society to validate the regional and local plans.

Recommendations

The state must participate actively in elaborating and enforcing technical regulations for the construction of safe facilities. One alternative could be to prepare the bidding documents to favor service privatization. The risk variable must be accounted for when defining efficiency and quality standards and service maintenance, operation and expansion plans.

National and local governments must include the notion of risk mitigation of critical services during their planning processes. Plans for safer services and cities must not only involve the individual sub-sectors but also the entities responsible for plan use management and planning, ministries of infrastructure, finance, etc.

Civil society must participate actively in credit negotiation processes (including universities and professional associations).

Municipalities and specialized technical groups must work together to eliminate uncertainty in their actions. In this regard, an important strategy for joint work is the definition by the municipalities of a requirement: what matters must be treated by the technicians.

Protective infrastructure projects must not increase any risk. Design and construction of works must be improved and supervised. The auditing of works is currently limited because regulations do not include the risk variable. In most cases, works adjust to the projects, but these do not respond to the surrounding conditioning factors. It is necessary to include the risk variable as part of an infrastructure pre-feasibility study.

Service concession contracts must depart from the old view of emergency management and focus instead on becoming instruments to guarantee vulnerability reduction. Mitigation must be considered part of service operation and expansion. The risk element must not be used only to produce emergency plans. This new approach must include mitigation as part of any routine management and operation, and must be a parameter to measure service quality and efficiency, the objectives on any service provided.

Professionals must insist on vulnerability reduction, from a broader context, not just sectoral characteristics but also elements from other disciplines that include such factors as location and organization. Graduate studies are available in Latin America for specialists in the planning and management of disaster-prone areas, with emphasis on planning and management of essential services in areas at risk. This approach certainly goes beyond the traditional view of emergency management, and becomes a tool for vulnerability reduction. Graduate courses are offered in Argentina, at the Universidad Nacional de Cuyo, and depends on the Centro de Estrategias Territoriales para MERCOSUR (Center for Land Use Strategies for MERCOSUR).

Mass media should not only focus on the disaster that occurred but should provide information on disaster mitigation and risk reduction and management. Journalists should be taught about their role as facilitators of information and as generators of the prevention culture. Significant progress has been made in the hemisphere in training journalists on

communicating about disasters and risk. Past experiences have shown that the lack of information during a disaster can aggravate the negative impacts of that disaster.

Community training in early warning is necessary to help society protect itself and prevent the loss of lives.

The state, through local governments, must develop and enforce regulations related to safer cities, constructions and services.

Vulnerability reduction plans and development plans must be a state policy, to ensure continuity.

Infrastructure that is vital to respond to disasters must be strengthened, optimizing its normal operations, efficiency, quality and competitiveness.

Risk assessment methodologies must include physical, financial and economic risks.

FINANCE³⁰

General

One of the fundamental problems of risk management is the lack of attention it receives from decision-makers and communities themselves. Traditionally risk management has meant the provision of assistance following the declaration of an emergency, coupled with meager preparations for disaster response and assistance.

Nonetheless, recent national and regional research initiatives have made significant progress in terms of understanding natural and man-made hazards and their impact upon the vulnerability of the population, infrastructure, productive capacity, and the environment. These studies have proven that disasters are the product of unsustainable development models in addition to natural phenomena.

The new paradigm in disaster management that has come out of these initiatives encourages risk management based on prevention, which is recognized as an investment rather than a cost. Accordingly, prevention activities are carried out through national risk management systems supported by comprehensive and efficient national disaster plans. The national bodies aim to integrate the prevention needs of the various service sectors, the governments themselves, the private sector, and civil society.

Multilateral banks have gradually become involved in disaster prevention and mitigation due to the tremendous impact of disasters on development. In particular, they recognize the undeniable effects of disasters on their own projects, with severe political, economic, social and environmental consequences. The costs generated by disasters and the need to finance expensive reconstruction projects have encouraged the development of a new development strategy that incorporates prevention and mitigation.

Extended debates have taken place regarding the introduction of vulnerability reduction clauses as a condition for awarding loans offered by multilateral banks. Some have questioned whether this is the responsibility of the banks or the countries themselves, and have proposed that instead banks should seek new strategies and tools that allow redefinition of responsibilities while allowing national risk management systems to carry out their missions.

Risk management can be approached within the financial sector from several viewpoints, including the normal and routine actions of the financial sector, and those focused specifically on risk management. To illustrate the former, the Inter-American Development Bank (IADB) has an institutional strategy that includes:

- Social sector reform
- Modernization of the state
- Competitiveness

³⁰ Kari Keipi, Thomas Schaefer and Sergio Mora of the Inter-American Development Bank (IADB) prepared the thematic discussion document and the IADB team was responsible for coordinating the work group.

- Regional integration
- Poverty reduction
- Environmental improvement

All of these factors directly relate to the development of a country, its institutions, productive capacity, environment, and level of equity, and ultimately determine vulnerability to disasters. Therefore, the IADB's routine actions in the field of development necessarily contribute to decreased vulnerability.

Regarding the latter approach, which focuses directly on risk management, the IADB has defined a series of elements that form its strategy:

- Prevention as an investment
- Correction of structural and non-structural vulnerabilities
- Comprehensive risk management
- Reduction of vulnerability and protection of the poor
- Private sector and civil society participation
- Coordination of international financing
- Mobilization of resources from existing financing sources (the banking system, specialized funds, development funds, and environmental funds)
- Development of new financial mechanisms (disaster insurance and bonds)

According to ECLAC estimates, disasters in Latin America have greatly increased in the last ten years. Damages have amounted to 20 billion dollars, or \$2 billion per year. About half are direct losses (e.g., infrastructure) and the other half represents indirect losses (e.g., decreased production capacity). The greatest problem in the region is the lack of transfer of losses to the sectors that can absorb them, which is a tremendous burden to the region. In Latin America, insurance companies cover only four percent of losses, while in North America one third of losses are covered. Banks have seen the direct relationship between a reduction in GDP and the occurrence of disasters, and these losses severely affect development.

Areas of intervention

The financial sector can work in fields before or after a disaster. Possible prior actions include risk identification and assessment, disaster mitigation and prevention, risk transfer, and disaster preparedness. Post-disaster activities include emergency response, rehabilitation and reconstruction activities.

The following table shows some of the areas in which the financial sector can participate in risk management and specifically describes IADB activities.

RISK PREVENTION AND REDUCTION				RECOVERY	
Identification of risks	Mitigation and prevention	Risk transfer	Preparedness	Emergency response	Rehabilitation and reconstruction
Assessment of natural hazards	Physical and structural mitigation work	Insurance and underwriting	Early warning and communications systems	Humanitarian relief	Reconstruction of damaged critical infrastructure
Vulnerability assessment (Exposed population and goods)	Land use management and construction codes	Financial market instruments	Contingency plans (public service companies)	Cleaning, temporary repair and restoration of services	Macro-economic and budget management
Risk assessment (hazard and vulnerability)	Economic incentives for mitigation	Privatization of public services with safety regulations	Emergency response institution networks	Damage assessment	Revitalization of affected sectors (exports, tourism, agriculture, etc.)
Natural hazard monitoring and forecasting	Risk and prevention education, training and awareness raising	Calamity funds (national and local)	Shelters and evacuation plans	Mobilization of resources for recovery (public, multi-lateral, insurance)	Incorporation of disaster mitigation components in reconstruction activities

One of the most important instruments used by the financial sector is the insurance market, essential to streamlining emergency and reconstruction processes, and developing stimuli aimed at risk reduction. The development of a sound insurance market depends on the following:

- **Regulatory adjustments** that allow both existing insurance companies to explore the field, and new entrants to participate;
- Clarity in the **land deed** process so that both government and private assets can be insured;
- Adoption of **construction and reconstruction codes**, as well as appropriate implementation and oversight mechanisms;
- Strengthening of the programs aimed at disseminating **information about risk** and increasing **awareness** of the issue among society;
- Design and implementation of adequate **incentives** to promote risk reduction actions, ensuring that all countries exposed to risk **assume the corresponding responsibility**, thus preventing the government entity or the donors from doing so.

The IADB has developed three areas of cooperation: financial services, new financing instruments, and personal services. Regarding financial services, the IADB has different components for the public and private sectors.

Public sector components:

- Loans: new projects and reformulations
- Technical cooperation: reimbursable and non-reimbursable
- Regional technical cooperation: non-reimbursable

Private sector components:

- Loans and technical cooperation
- Capital investments
- Risk capital investment funds
- Subordinated loans
- Risk capital funds for small businesses
- Stock and security issue guarantees

New financing instruments:

- Emergency Reconstruction Mechanism (ERM)
- Disaster prevention facilitation
- Innovation loans
- Project preparation and execution services

Personal services:

- Technical assistance and dissemination of good practices
- Environmental impact assessment of projects financed by the Bank
- Support of national policy dialogue
- Organization of national and international conferences
- Regional and extra-regional interchanges
- Mobilization of resources and donor coordination

The new paradigm in risk management has thus generated several original insights:

- Sufficient knowledge exists about the genesis of disasters in the region, and the complex relationship between increasing vulnerability levels on a global scale, and the particular threat of natural and man-made hazards in the Americas.
- The critical mass of scientific, economic and social experts devoted to risk management that has developed over the last 20 years has increased awareness of risk management and awakened interest among political decision-makers.
- Risk management has transcended the domain of disaster management and is now dealt with by development agencies as well, using a trans-sectoral and inter-disciplinary approach.
- Financial and development organizations are using new strategies and instruments to approach risk reduction and to ensure a commitment and shared responsibility from recipient countries.
- In spite of recent progress made, risk management is still not given sufficient attention by authorities, decision makers, or communities. Frequently, resources only flow in once the disaster has occurred. The serious economic situation in many of the countries

of the Americas distracts attention from other vital issues. This situation generates sporadic and reactive responses rather than proactive and preventive actions.

- Current trends in the Americas, including democracy strengthening, state reform, adjustments to the development models, decentralization, and greater participation by civil society, foster an appropriate environment for the inclusion of risk management as a key aspect of sustainable development.

Group discussion

The involvement of the financial sector in risk management can be approached from the perspective of various sectors within the government. Below are descriptions of the objectives, institutional goals, technical-economic proposals, and financial instruments that relate to the following sectors: education, health, food security and critical lifeline services.

Education and finance

Objective

To raise awareness among those responsible for the education and finance sectors regarding existing problems and opportunities and the identification of areas of action to improve funding of mitigation and prevention investment in educational facilities.

Institutional goals

To seek priority for prevention and mitigation at the political level (e.g., ministries of finance and planning) to obtain necessary funding.

To establish incentives to motivate investment in prevention and mitigation.

To establish the responsibilities and authority of the ministries of education, national risk management systems, municipalities and communities, with the participation of financial entities, such as, social investment funds.

Technical-economic recommendations

Consider indirect losses in the pre- and post-disaster evaluation of potential damage, in order to justify investment in prevention and mitigation.

Define the information needs to gain awareness of the hazards and vulnerability of the sector.

Involve risk management in land use management processes.

Implement construction standards and oversight as the shared responsibility of financial and sector institutions.

Emphasize the real application of site, design, construction and maintenance codes and standards.

Conduct audits and inspections of facilities by independent entities.

Recommendations for financial instruments

Take advantage of the various existing internal and external funding sources, such as the Disaster Prevention Facility of the IADB and the World Bank.

Consider transferring risk of educational facilities to insurance mechanisms.

Establish the conditions to create an insurance market by implementing appropriate policies and regulations, facilitating information on risk, implementing audits and inspections of the facilities and real application of the codes.

Health and finance

Objective

To raise awareness among policy makers of the health sector and the financial sector regarding existing problems and to identify areas of action to improve access to financial resources for mitigation.

General comment

Offering a vulnerable, inefficient or unstable service may, in itself, generate a risk.

Institutional goals

To establish cooperation mechanisms between political ministries and the private sector.

To establish mechanisms to guarantee user access to risk management in relation to the availability of services and their participation in overseeing the services rendered.

To define the roles of the ministries of health, public works and finance as planners, investment promoters and implementers of financial programs.

To identify the regulating entities that can promote competition, prevent monopoly practices, establish the bases for fees and incentives and define efficiency criteria.

To promote the participation of the municipalities within the decentralization schemes for rendering services to the population.

To ensure that service privatization processes are carried out with the necessary investment in prevention and mitigation.

Technical-economic recommendations

Promote the reduction of the impact of disasters on health, water and sanitation facilities.

Prepare standards, codes and technical guides for certification of facilities to apply prevention and mitigation measures that facilitate the sustainability of investments and to provide better justification for obtaining funding.

To conduct technical and economic studies to establish the bases for fees and incentives.

Share the responsibility of overseeing the quality of investments among sectoral entities and financial institutions.

Recommendations for financial instruments

Take advantage of multiple internal funding sources, such as transfers from the central governments to the municipalities, use of the municipalities' own resources, national sectoral funds, social funds, urban development funds and municipal funds.

Consider the various external credit lines and access to them with the endorsement of the central government to finance municipal projects.

Analyze the benefits of three financial mechanisms relatively new to the region: disaster and prevention funds, disaster bonds and insurance.

Critical facilities and finance

Objective

To establish an agenda for the decision makers of institutions responsible for critical services and for the financial area, to improve funding for mitigation investments.

General comment

Moral risk: conformism leading to only partial compliance or with insufficient design standards, allows some specific interest groups to benefit.

Institutional goals

Identification of responsible entities that include the following actors:

- Decision makers (sectoral ministries, finance, planning) to define investment priorities
- Sectoral ministries for project development and implementation
- National risk management system
- Municipalities as principal implementers of investment
- Service users

- Contractors and consultants
- Financial entities: banks and insurance companies

To establish the responsibilities for assuming risk among the public and private sectors for privatized services.

Technical-economic recommendations

Design and promote instruments that guarantee the quality of works and maintenance: standards, codes, certification, training and other elements necessary for risk management.

Pay adequate attention to the external factors of the investments of a sector that may cause calamities in another sector (e.g., construction of a new road that creates vulnerable settlements).

Promote transparency in awarding work contracts through bidding processes among certified companies.

Recommendations for financial instruments

Consider transferring risk through insurance for public as well as private infrastructure, including services. Establish a dialogue with insurance companies, to diminish moral risk and to establish appropriate construction standards and codes, etc.

When it is not possible to transfer risk onto insurance markets, consider the establishment of specialized funds, such as calamity funds, as is the case in Colombia and Mexico.

Food security and finance

Objective

To raise awareness among decision-makers in the institutions responsible for food security and the financial sector to favor improvements in financing food and nutrition programs as a means to reduce vulnerability.

General comment

The problem of food insecurity is structural in nature and requires changes in the integrated and multi-sectoral approaches to the issue.

Institutional goals

Include nutrition and food security in the agendas of international meetings, as well as political dialogues at the regional, sub-regional and national levels. Formulate food security policies, plans and programs with a multi-sectoral and multi-disciplinary approach as a risk reduction strategy.

Establish a network of national institutions from the public and private sectors involved in food security and nutrition to exchange experiences and information regarding optimization of financial and non-financial resources.

Technical-economic recommendations

Analyze the causes, risks and distribution of food insecurity and nutritional vulnerability to identify the priorities for intervention and financing.

Broaden the emphasis placed on food availability and production to include other linkages of the agri-food chain that impact nutritional vulnerability: access, consumption and biological use of food items.

Take advantage of multiple internal funding sources, such as transfers from the central governments to the municipalities, use of the municipalities' own resources, national sectoral funds, social funds, urban development funds, and municipal funds.

Recommendations for financial instruments

Funding to support the recovery of food security must be disseminated, integrated, promoted and requested.

Insurance and participation of the private sector must be introduced into debates regarding food insecurity and vulnerability.

Raise awareness of decision-makers in national institutions and international organizations that the funds available for food security can be used to reduce vulnerability.

Promote funding mechanisms for the most vulnerable sectors (e.g., micro-credits, revolving funds).

INFORMATION, TECHNOLOGY AND CONNECTIVITY³¹

General

In the Connectivity Agenda for the Americas established during the 2001 Summit of the Americas, the need to develop, implement and sustain shared comprehensive disaster management strategies and programs was recognized as a key factor reducing the vulnerability of our populations and economies to natural and man-made disasters. Likewise, the Agenda also noted the need to expand the community of stakeholders at the regional, national and local levels engaged in the formulation of early warning systems, risk management and response, and integrated sustainable development strategies.

Advances in science and information technology create the potential for development of new applications for disaster mitigation, prevention and response actions. Today, information is being generated from multiple sources and data is being gathered in many forms and formats around the world. These developments have fostered the new area of digital information management, which is concerned with managing and bringing coherence, usability, and accessibility to this very large amount of data, and with transforming such data into information and knowledge that might be applied to disaster management.

The growth and development of information technologies has also dramatically increased the possibility of connecting communities from remote regions to each other and to global sources of information. Ever-increasing access to the Internet provides the foundations for the growth of information, technology and connectivity. This growth is reflected in research and development of digital information centers that impact public and private organizations.

The way in which societies relate to each other has been accelerated by the expanding access to Internet and the extensive use of information and connectivity technologies. The Internet has also promoted a process of “information regionalization” by allowing citizens, organizations and institutions in most countries to share information and knowledge resources that, in many cases, could deal directly with the study, analysis, prevention and response of natural disasters. The Internet and the widespread use of Information, Technology and Connectivity (ITC) tools provide a golden opportunity to collect data in a systematic and rapid manner.

Areas of intervention

ITC tools offer the means for communities, national and international organizations and governments to interact, exchange information and support one another both before and following natural disasters. ITC tools can be used to develop and carry on training seminars and workshops, transfer information, and improve the management of disaster

³¹ David Novelo of the Coordination Center for Natural Disaster Prevention in Central America (CEPREDENAC) prepared the thematic discussion document and the CEPREDENAC team was responsible for coordinating the work group.

relief, etc. ITC tools facilitate access to alternative sources of information and communication in emergency situations and will promote the participation of all sectors.

In the realm of disaster management and risk reduction, connectivity offers:

- Networking between public and private institutions and communities.
- Broader access to information for decision making purposes.
- Cooperative educational programming.
- An information-sharing environment via World Wide Web servers, e-mail and interactive software systems.

The specific recommendations established during the 2001 Summit of the Americas regarding ITC for disaster reduction included:

- Promote vulnerability reduction by, for example, using ITC to promote the adoption and enforcement of better building codes and standards.
- Establish the cooperative mechanisms among countries and agencies, both regional and international, to access and share advances in science and technology and their application in the early warning, preparedness for and mitigation of natural hazards.
- Promote the exchange of information on the vulnerability of infrastructure exposed to disasters as well as the early warning capacity.
- Establish or strengthen, where appropriate, partnerships that improve information access and sharing among all relevant actors, including the private sector, technical professional associations, regional institutions, civil society, educational and research institutions and other multilateral coordinating agencies.
- Promote the development of telecommunications for humanitarian assistance; actively encourage greater use and inter-operability of technologies and information systems that allow the observation and monitoring of different natural phenomena.
- Use early warning systems such as remote sensing imagery and Geographic Information Systems (GIS) -based data necessary to address and prevent emergencies; promote the inclusion of these systems in the planning and response to emergency operations.
- Strengthen and make full use of information networks to exchange scientific and technological knowledge and experiences; promote joint research and the development of technologies that contribute to strengthen coordination of national prevention and response agencies in disasters.

- Adopt and support appropriate initiatives aimed at promoting capacity-building at all levels, such as the transfer and development of technology for prevention-risk reduction, awareness, preparedness, mitigation- and response to natural and other disasters.

Group discussion

As a response to these objectives, the ITC Working Group of the Disaster Risk Reduction Hemispheric Conference developed an Agenda with the following purpose:

- Identify the kinds of information and technology that are available or could be developed for disaster risk reduction.
- Identify information needs to improve decision making related to natural disaster mitigation, preparedness, response, and recovery.
- Review the possibilities of implementing a virtual information network using modern capabilities for accessing and integrating disaster information.
- Discuss with key players mechanisms to facilitate a hemispheric strategy regarding information and technology for disaster risk reduction that meets the needs of decision makers.
- Present recommendations and strategies for a Plan of Action.

Working Sessions were organized with the following sectors: Critical Facilities, Health, Education and Food Security and Agriculture. The common key recommendations from the four working groups were:

- Standardized protocols should be followed.
- Establish Meta-standards for data and its use.
- Connectivity should be the goal, and not compatibility (at the community, national and regional level).
- Users should take the initiative to identify the type and quality of information needed.
- Important to work together: establish mechanism of coordination among different actors and sectors (i.e. government, academia, civil society).
- Data, information and response should be decentralized.
- Information and data on vulnerability such as risk maps are needed at the local, national and regional level.

- Information and technology for education, behavior change and marketing are key at all levels, from the community to the political level.
- We should be aware of technology limitations. Quality control of data is a major issue that needs attention.
- Promotion of training for decision makers to use and synthesize data to make decisions.

Education and food security/agriculture and information technology

Recommendations

Establish a permanent forum (electronic) to discuss issues and share information on education for risk reduction.

Provide training, data and information to communities through connectivity.

Promote use of radio and television in communities for information and education on disaster risk reduction.

Develop professional programs through a network of universities.

Health and information technology

Recommendations

Generate common indicators about risk at the regional and hemispheric level.

Establish guidelines for the development of information technology that reduce risk to health infrastructure and the health sector.

Provide incentives to universities to promote development of information technology applications defined as necessary.

Promote the use of Geographical Information Systems. Identify open systems of high quality and low cost.

Maintain and develop programs for training in Geographical Information Systems.

The initial General Plan of Action proposed by the Working Groups is:

- To organize Regional Workshops/Seminars to discuss these issues with professionals and decision makers (Government and Civil Society) about their specific needs on information and technology.
- To promote the establishment of connectivity programs with communities at the national and regional levels.

- To coordinate regional actions through regional institutions (i.e., CDERA, CEPREDENAC, PREANDINO) and the international cooperation agencies.

Critical facilities and information technology

Recommendations

Strengthen and develop regional monitoring systems of the hazards to which the different regions are exposed.

Conduct an inventory at the regional level of the vulnerability of critical facilities.

Share lessons learned.

CIVIL SOCIETY³²

General

Modern society has three clearly defined spheres: state, market, and civil society, that interact among themselves³³. In this context, Diamond³⁴ describes civil society as “the realm of voluntarily organized social life, self-generating, (extensively) self-supporting, autonomous from the state, achieving cohesion through a shared legal order or set of rules. It is different from the ‘general’ society, as it involves citizens that act collectively in the public sphere to express their interests, passions and ideas, exchanging information, reaching common goals, demanding from the State, making state employees accountable ... excludes...political efforts to control the State.”

Civil society includes a multitude of different organizational forms including:

- All types of volunteer associations, legally registered or not;
- NGOs (non governmental organizations) carrying out emergency, development, human rights, incidence and training work;
- Community-based organizations;
- Professional associations, business associations, labor unions;
- Women’s groups and organizations; self-management economic empowerment groups and cooperatives;
- Cultural, sports and entertainment groups;
- Tribal or ethnic associations; academic and research institutions.

Civil society does not have representatives as such, lacking the mechanisms to elect or designate them. Although there is a tendency to use the collective term “NGO” (non-governmental organization) in conjunction with civil society, a manifest interest can be observed from some NGO leaders to assume the role of spokespersons for civil society. There is currently an intense debate in this respect.

The presence and importance of civil society at the national, sub-regional, hemispheric and global levels is not only an uncontestable fact but also an element of complementarity that cannot be substituted in the relations between society and the state and therefore of public policies, particularly social policies. From this perspective, the connections between civil society and natural disasters are many and cannot be subsumed by the state or other actors.

The role of multilateral organizations and cooperation agencies is fundamental, as it strengthens the autonomy, self-management capability and the generation of self-organization mechanisms to overcome the difficulties within civil society. All of this favors the generation of an inter-institutional and inter-disciplinary organizational work

³² The Office of U.S. Foreign Disaster Assistance (USAID/OFDA-LAC) prepared the introduction of this chapter and the Secretariat of the International Strategy for Disaster Reduction was responsible for coordinating the work group.

³³ García, S., 1997.

³⁴ Diamond, L., 1994, paragraph translated from a Spanish version.

climate between civil society and the state, with the objective of achieving sustainable development.

Civil society continues to become better informed, trained, educated, actively committed and involved in the development of their communities. To accomplish this, however, it is necessary to strengthen the decision-making capacity of civil society at the local, regional, national and international levels to open spaces for reflection and foster agreement on key development issues. Such an environment should encourage participants to contribute lessons learned from their experience and to learn from others in an open dialogue.

Group discussion

It is necessary to recognize that disasters are now more than ever dependent on human behavior. The true sense of civil society participation in issues such as the reduction of vulnerability in the health sector, critical facilities, education, and food security means that civil society should be an integral part of these processes, owning and utilizing technical information to reduce vulnerability, and working hand-in-hand with the state and the cooperation organizations to generate synergy.

Education and civil society

Efforts to educate the public about risk management is intended to encourage the active and on-going participation of civil society. Articulation of social actors is the starting point for the generation of integrated initiatives. This also enables decentralization of activities and understanding by social actors of their corresponding commitments.

Civil society's participation is based on recognition of the strengths and weaknesses by each social actor; this is the only way to divide and then integrate responsibilities. It is indispensable for organizations to keep an open mind and to facilitate integration of civil society and the government sector. Undertaking joint actions shows respect for the function of each social actor. The participation and articulation of civil society organizations should be understood as part of a broad and open system, in which "all of us are necessary."

Civil society requires the political and economic support of the government, with clear guidelines for disaster prevention and mitigation strategies. It is important to return to one of the resolutions in the Plan of Action of the Declaration of Quebec that defines the commitment of the governments to establish and strengthen the relations with the pertinent sectors in the development of national and local policies and programs. Civil society is considered to be a key sector for these purposes.

General comments

Education of civil society is recognized as a fundamental pillar in the processes to transform the risk conditions of communities, especially considering that civil society leads change locally.

There are scattered efforts in education for risk management, typically executed as short-term projects. These efforts should be integrated and expanded into mid- and long-term projects.

There is much experience in human resource training, however, progress needs to be made in public information and communication.

Articulation of the main social actors, accompanied by dialogue and tolerance, is indispensable to achieve complementarity in risk management.

Education and public information should incorporate all the values on which risk management is founded (self-conservation, cooperation, commitment, and collective work).

Important Players:

- Educational centers, seen not only as the teaching and administrative staff, but the entire educational community, including students, families, and communities.
- Community organizations working in development programs and particularly those representing vulnerable communities.
- Universities, especially in the communities, which can generate and transfer scientific information, as well as contributing a methodological approach.
- Mass communication media-- distinguishing between local or national outlets-- since local media are more committed to participating in community development and play a key role in risk management.
- NGOs with education and information programs for communities and other important social actors, such as grassroots and second line organizations.
- The state, in concertation with civil society.

Recommendations

Strategies and stimuli for civil society participation:

- Involve civil society in risk and risk management research, with a “dialogue of wisdoms” approach.
- Convert the formal and non-formal education programs into the ideal way to achieve participation by civil society, creating strategies to enable this participation.
- Empower the communities, as an objective of education, to strengthen their capacities and to contribute to generating change.

- Facilitate access to information regarding the channels and language used to share information on risk.

Proposed concrete actions:

- Undertake joint research between civil society and academic institutions to strengthen education, public information and communication initiatives.
- Request that governments foster close links between the education centers and communities.
- Train key actors on risk management issues, using integration and articulation programs.
- Execute social communication and information programs to contribute to the knowledge of communities about risk and to foster committed social activities.

Health and civil society

Civil society is an intermediary of power, and is both the object and subject of social policies. In this regard, the development-health-risk management concept should be emphasized, as it currently recognizes organized civil society as a key player.

Many public and private entities and international organizations make evident the importance of this process, especially as it refers to access to information and creation of discussion spaces.

One of the objectives of health sector organizations is to focus on the vulnerability of this sector as a problem that affects the whole, making participation by all necessary in order to reduce it.

In addition, given the reduction of state investment in health in most countries, it is not possible to think about excluding civil society from the development of health policies.

General comments

The vulnerability conditions of the health sector are closely linked to the development level (potable water, basic services, nutrition and food security, immunization levels, among others).

Reducing the vulnerability of health facilities is a priority for managing risk in the communities and the health services.

Integral rather than sectoral approaches should be emphasized as the most appropriate way to respond to disasters, where significant weight is given to initiatives by PAHO/WHO and other international organizations to strengthen local and state capacity.

Cultural variables, because they are so determinant, must be incorporated into the research.

Since civil society is a priority and key actor in improving health, its participation must be encouraged through municipalities, community leaders and organized social groups, with environment, mitigation and disaster reduction as cross-cutting themes.

State and private universities play an important role in producing scientific knowledge, training human resources and in the relief assistance they provide, where they enter into contact with reality and learn from it.

Community organizations and social movements have an increasingly important role, and are becoming social pressure groups over the state, private companies, NGOs and other cooperation organizations, demanding compliance with their right to health and to actively participate in designing the solutions.

Risk management is a political decision and therefore requires coordination and integration of actions between the state and civil society.

Information on mitigation and risk reduction does not reach organized groups of civil society in a timely manner or in an appropriate language.

Important players:

- Universities and professional associations, in research tasks and in the construction of secure facilities and vulnerability studies of the community.
- The state, in the development of specific plans implemented at the national, regional and local levels.
- The communication media, in awareness raising and dissemination of information and knowledge to the whole community.
- NGOs, in the implementation of health programs among the most vulnerable groups.
- Organized communities participating in program development.

Recommendations

Strategies and stimuli for civil society to participate or to broaden and deepen its participation:

- Ensure that health programs constitute an important element in improving the quality of life.
- Generate improvements in knowledge and human development, making civil society a participant in the development of local and national policies.

- Recognize and empower civil society as a key actor.
- Formulate new strategies, using the information media to benefit the public.

Concrete actions proposed:

- Given the degree of risk in the countries of the region, work on the reinforcement and construction of safer facilities.
- Empower civil society in general and community organizations in particular, in their role as generators of health policies.
- Understand health as a component of social and human development, and foster fora and events in which civil society can participate and offer its contributions.
- Make information on disaster prevention available to all through the mass communications media.
- Establish priorities in health policy to educate civil society in the development of health programs and projects.

Ensure that the knowledge possessed by professionals and technicians is disseminated among the community. Once the information is “owned” at the community level, civil society can act on this knowledge.

- Work on proactive actions and develop integrated risk management activities.

Critical facilities and civil society

The state participates in the preparation and application of the technical standards for the construction of safe services and facilities.

Civil society actively participates in the identification of risks, as it is very familiar with and actively experiences the needs and vulnerabilities.

Private companies and cooperation organizations can actively participate in the projects related to facilities, thereby fostering the improvement of safety standards.

General comments

New investments in state and private facilities are scarce, and therefore the level of risk is high. Social pressure from the population is necessary for the state or private business to take actions, so they can generate new investments that include improving safety conditions.

A community early warning mechanism is necessary, especially from professional groups, to avoid reconstructing the vulnerability.

It is necessary for international credits to be monitored by professional associations and universities as process overseers, and to guarantee that investments in critical facilities are aimed at reducing vulnerability.

Recommendations

Strategies and stimuli for participation of civil society:

- Community-level consultations or local referendums should be democratic, direct, and holistic consultation mechanisms that promote the sense of ownership of a critical project or facility. They arise from the inclusion of all sectors of society in the corresponding processes.
- The validation of regional and local plans by civil society for the purpose of expanding its participation is the key to the success of projects for the reduction or elimination of vulnerability.

Concrete actions proposed:

- NGOs and cooperation organizations should be more pro-active in risk management.
- Civil Society Organizations (CSO) should generate proposals for strategic alliances with the state and cooperation entities for the development of prevention and mitigation programs.
- Provide the communications media with adequate training regarding their role as facilitators of the information and generators of a prevention culture.
- The state, through the local governments, should ensure compliance with safe construction standards.
- Convert development plans into state policies, guaranteeing continuity of management.
- Enable the strengthening of health facilities and all essential infrastructure to provide disaster assistance.
- Include physical, financial and economic risk in risk assessment methodologies.
- Include risk mitigation measures in concession plans.

Food security and civil society

The participation of civil society in building food security has been historical and must arise from the holistic conception of both themes.

Food security is one of the pillars in the solution of vulnerability problems present in communities with high levels of poverty and low education and development levels. We must be capable of making a proposal wherein food security can be guaranteed and constituted into a state political issue, with participation by all.

General comments

Recognizing the absence of representation by entities and representatives of civil society organizations at the Hemispheric Risk Reduction Conference, one recommendation is to promote and ensure active participation by civil society organizations at future conferences in which food security is specifically treated.

Vulnerability associated with food insecurity is increased by the reduction in the size of the state, and it is almost impossible for civil society organizations, particularly NGOs, to fill the large gap that the new globalization paradigm has produced. The sustainability of food security can only be ensured with the active participation of civil society.

Recommendations

Participation of civil society ensures building food security and should be approached from the holistic conception of both themes.

Recognizing the diversity and heterogeneity of civil society in the hemisphere, the experiences of civil society related to food security should be systematized and disseminated. This, in turn, could be an important contribution to regional, national or local decision-making in similar situations.

Identify ways to achieve food security for those disadvantaged or marginalized groups that are related to local food production and who must generate other strategies for survival, especially pre- and post-disasters.

Identify and promote experiences with donors that have developed innovative models to strengthen local capacity for project management and execution.

Identify the experiences and lessons learned that generate credibility and changes of attitude among the cooperating community and direct representatives of civil society capable of organizing, owning the processes and showing the transparent use of resources.

Develop a legal framework that fosters authentic and representative participation by civil society. The framework should consider the development of actions that:

- Begin at the local level,
- Generate information to foster participation,
- Develop strategies to strengthen the capacity for authentic and representative participation,

- Strive to find spaces among the financial sector, civil society and donors, among others,
- Build public interests by creating alliances between the productive and social sectors that benefit all, empower civil society,
- Seek mechanisms and actions to propose changes and to jointly build food security, and
- Generate dialogue and communication channels among the different sectors of society.

LAND USE MANAGEMENT³⁵

General

In order to discuss land use management from the risk management perspective, several basic premises must be set forth.

First, and as the starting point, it must be accepted that actions by human beings modify the dynamics of the natural environment, which can impact the stability of the socio-spatial system, oftentimes in a violent, catastrophic and even irreversible manner.

It is also accepted that these processes generate and/or increase risk conditions of different types (natural, socio-natural, technological) and subject the components of constructed space and its population to various levels of fragility and vulnerability.

These recognitions, together with the availability of orderly and manageable data and technology advances, have expanded the concept of risk to encompass risk management, especially in the past few decades, showing greater awareness about the real capacity of mankind to manage these processes, to reduce the vulnerability to catastrophic events and to move towards a more comprehensive and anticipatory approach.

Secondly, it is convenient to agree on a definition of land use management, as a discipline aimed at the global and concerted organization of space, to meet the present needs and future demands of society. The current fundamental values are different from those that guided policies in the past: going from a simple vision of actions and policies aimed at preparing the land for human development activities, headed centrally by the government (overcome more than a decade ago) to a more dynamic vision where the concepts of competitiveness, job generation, social equality and environmental sustainability are the basic principles.

Land use management is a horizontal, cross-cutting policy, in which space is a link among the sectoral policies. The European Land Use Management Charter (1993), signed by the countries represented at the European Conference of Ministers Responsible for Land Use Management (CEMAT), has provided a broadly disseminated and widely accepted definition of Management:

“the spatial expression of economic, social, cultural, and ecological policies of society”³⁶. This is, in turn, as stated by Romá Pujadas and Jaume Font (1998)- “a scientific discipline, an administrative technique, and a policy conceived as an interdisciplinary and global approach, the objective of which is the equitable development of the regions and the physical organization of space pursuant to a guiding concept.”

³⁵ Stephen Bender of the Organization of American States (OAS) prepared the thematic discussion document and the OAS team was responsible for coordinating the work group.

³⁶ European Commission, 1995.

Areas of intervention

Land use management responds to the main questions: What to manage? Why manage? How to manage?

If we consider what to manage, this defines and deals with the reasonable and competitive organization of activity systems, reflected in land use of distinct territories: residential, agriculture, forestry, industry, infrastructure, facilities, green areas and others, as the expression of the social organization of available space.

If we define why manage, the policies respond to the goals and objectives set out for the development of communities that implement land use management and are the object of special laws and regulations to, among others, promote economic development, improve the quality of life of the inhabitants, and protect the natural environment.

When dealing with how to manage, reference is made to the management criteria to be used to reach the goals set out, remembering that land is a scarce good (i.e., land that is apt for agriculture) and demonstrating the limited nature of land and the need to protect it in an efficient and safe manner, not only for the inhabitants of today but for those that may use it in the future.

In general terms, one could say that the concept of management, in many cases, has been replaced by the *sustainable development of land*, by using dynamic tools such as strategic, participatory, decentralized, concerted and coordinated planning involving all public and private stakeholders.

The anticipatory and strategic management appears to be “the one that attempts to reconcile market economy with the new roles of the state, agreeing to actions with the private sectors, and coordinating undertakings between the public sectors and the territorial jurisdictions. It is also anticipatory in that it establishes alternative future scenarios as framework of reference, it is based on the consensus, agreement and commitment of protagonists and jurisdictions, while it is also based on reflection and action and attempts to serve as framework of reference for territorial governance.”³⁷

In this context of changing scientific and technical notions, *land management* unites these two broader approaches, where both *territorial re-functionalization* (T.R.) and *risk management* (R.M.) to reduce vulnerability aim to ensure the sustainable development of human habitats. Fundamental in this convergence of interests is that current management does not separate medium and long-term situations and implies mobilization and consensus among the sectoral protagonists, who are development managers due to their link with the planning, funding and execution levels.

These definitions, which provide an integrated and inter-related approach, have served as a framework for discussion, resulting in the following questions:

³⁷ Roccatagliatta, J., 2001.

- From the land use management perspective, how to approach the social and economic effects resulting from repetitive natural phenomena that often turn into socio-economic catastrophes?
- How to introduce the notion of vulnerability reduction into the land use management processes that are, in turn, part of sectoral development processes?
- Who is responsible – institutionally, financially, communally, scientifically, socially, sectorally, technically, etc. – for resolving crosscutting issues?

Group discussion

The proposal to enter into a discussion with experts in land use management and the relevant sectors has been important to define what happens in the dialogue between *land use managers* and *risk managers*, to determine the level at which the dialogue takes place, and the trends observed in the joint field of action in the different sub-regions (Andean, Caribbean, Central America, North America and Southern Cone):

- the persons responsible for ensuring agriculture and food security;
- the sector responsible for promoting education;
- the health sector;
- the critical or basic services required for the development of nations.

A group of professionals from the different participating sectors, who master the land use management tools available to intervene and collaborate in the risk reduction process, serve as a basis for understanding these relationships.

These professionals have brought the biggest challenges to the dialogue because, they believe, there are *triggering issues* that need to be resolved in order to build a stable relationship between land use management and risk management as the manifestation of risk managers to use the territory with a sense of anticipation, risk prevention and, especially, reciprocal collaboration to achieve integrated and sustainable development. These triggering issues include the availability of information, existence of a vulnerability analysis method, identification of responsible persons, training, and implementation of risk management enforcement in land use management plans. This group of professionals must constantly strive to introduce the concept of vulnerability reduction and risk management into land use management.

The group, which interacts with diverse organizations and private and public actors, and which uses land use management standards, is key to starting a movement capable of creating safe and sustainable scenarios. The term *scenario* should be understood here as the step-by-step simulation of turning a land use system into a possible and desirable future situation. This is the objective of the overall community and is reflected in a pre-set integrated image, to correct the environmental, social, and economic problems, to improve living conditions, and to guarantee the permanence and safety of settlements, goods, and services.

Some sectors or components view disasters in a traditional sense; that is, they do not recognize their vulnerability to socio-natural hazards and do not account for risk management. At the same time, they stress requesting national or international aid, and opt to use emergency laws to solve their problems. Consequently, they fail to see their responsibility in vulnerability reduction as owners and/or operators of the vulnerable social and economic infrastructure. In this case, land use management is not considered a tool to avoid or reduce risk, but is interpreted only as an instrument to face land occupation.

Nevertheless, in this context the food security sector considers issues such as drought and forest fires a top priority, since they periodically make populations dependent on permanent assistance for long periods of time, especially in Central America.

On the other hand, they also speak to the need of ensuring the non-contamination of water reservoirs for human consumption and irrigation purposes. The objective is to continue supplying water for production destined to international trade, to control the spread of emerging diseases, and to promote personal food security.

These issues are linked to land use management actions, such as climate monitoring, prevention in forested areas, reservoir management and water basin management.

Other sectors have the capacity to manage risk and reduce vulnerability but only from inside each sector and, consequently, the tools used will be responsible for reducing risk.

In the latter situation, different sectors see land use management as a tool to help determine the adequate location for given activities. From this viewpoint and considering the new land use management approaches where the fundamental principles are competitiveness, job generation, social equity and environmental sustainability, some sectors have an outdated and erroneous idea of these elements and, therefore, do not understand their advantages.

It would be interesting to pick up the reflections of sectors like agriculture, education and critical services, which view this concept from different perspectives.

The agriculture sector clearly pointed out that its activity, as such, would be an at-risk sector, consisting of at-risk groups, namely, children, women, the elderly, small producers, unskilled labor, and would be based on the use of at-risk resources, i.e. water and soil. Also highlighted was the high vulnerability of populations most susceptible to natural phenomena, and the strong impact of macro-economic policies on this activity.

In Central America, Bolivia, Peru, Ecuador, Belize and other countries, the sectoral weakness lies in imbalanced land tenure, the cost of installing irrigation systems, erratic climate cycles, migration to areas with good soils, the perforation of water wells, legal problems, inadequate incentives, exchange rates, and political manipulation, resulting in the scarcity of resources and extreme poverty, poor location of settlements, inadequate use of the scarce resources, and availability of very deficient construction systems and materials.

These vulnerability factors are related to the precarious socio-economic conditions of rural communities. Natural phenomena, therefore, are favored by suitable conditions to produce true disasters and to, in fact, uncover even more weaknesses.

A broader scope arises from this: although some weaknesses were overcome with a good land use management plan, other aspects go beyond these tools. The questions are evident and continue to go unanswered in most countries of the hemisphere:

- What weight do natural hazards have, as compared to others (economic, social, environmental, technological, etc.), on the ability of rural communities to undertake their activities and produce a sustainable economy?
- Which parts of these problems could be corrected through land-use management and risk management, and how could they improve the global situation?

In the education sector there is a growing interest in advancing the adoption and use of better construction techniques, and forming a closer relationship with the school and out-of-school community to bring them on board the process and expand the risk-related content of the curriculum.

The education sector has begun a rich discussion and has identified which tools are available and which are not, the operating frameworks, and the methods to provide better safety and a better quality of life for the education community.

However, the analysis only covers that sector, limiting the ability to respond to other complex problems, such as the participation of members of the education sector in critical areas like the significant transportation of hazardous materials, pollution or dangerous activities close to schools, and areas of technological hazards.

In many cases, “preventive” actions are really not so. The true and total response should result from dealing with and managing other situations not related to, but that impact on, education, limiting the possibilities only to better emergency response yet not correcting the underlying cause. School infrastructure is particularly vulnerable, since the building itself represents continuity, stability and commitment to the community. Without buildings, the education process is hindered.

The global territorial perspective of land use management may provide suggestions on ways to better organize the sector to continuously face all types of issues instead of only responding to given dangerous events.

For this to occur, the education sector must open up, understand the opportunities brought about by land use management, and recognize that the tools used to date can be improved through dynamic interactions and instruments usually in the hands of local governments.

Regarding critical facilities, experts in basic-network management (water, sewage, transportation, communications, etc.) have indicated that although overall infrastructure can have a positive impact, it also represents additional costs (due to inadequate networks and

technologies, different operating systems, and the need to expand the usable space) that the limited budgets of many countries cannot cover.

It is worth stressing that the basic infrastructure, as well as the info-structure (those networks that support the new communications systems that unite the world), face these same problems and are just as vulnerable as any other element of the productive technical capital, with all the complications and effects a paralysis or partial loss would have on the productive system of a region, a country and even the world due to the globalization of the economy.

These undesired costs are linked to how land is assigned for diverse activities, the structure of urban systems and territorial dynamics. Factors such as inadequate urban growth, poor planning favoring the expansion of settlements to hazardous areas, the lack of incentives and adequate laws, the absence of prevention and mitigation measures, deficient training of human resources, the participation of the public sector, and the excessive influence of politicians in technical decisions can also play important roles in land management use.

These problems grow exponentially due to the new spatial rationale applied by production companies, which results in the flexible and discontinuous distribution of stores and the concentration of inter-connected and spatially distant production complexes. Such construction would have been impossible without the interconnected transportation and communications network that favor building production chains to strengthen competitiveness. "Infrastructure and info-structure play a leading role in territorial modeling, which is the reason why its treatment cannot be disconnected from a land use management and regional development strategy" (Roccatagliata J., 2001).

Infrastructure and info-structure are fundamental to the positive socio-economic effects of investing in country development. At the same time, they are exposed to many risks that compromise their existence and growth and that obstruct any maintenance work.

Since policies related to risk management and land use management tend to focus on areas of high population concentration or in cities, it is difficult to attend to infrastructure in areas of low population as well. Rural sectors and dispersed populations are also affected by the impact of disasters and by unorganized intervention groups. The management and administration of sanitary landfills and the final disposal of solid wastes must also be included among the critical services to have a global perspective of all risks.

The recent events in some Central and South American countries have uncovered the lack of prevention plans, both in land use management and in infrastructure risk management (roads, water, sewage, communications, etc.) that have caused millions of dollars in losses in basic networks and further indebtedness to repair and rebuild what was originally built with loans, resulting in a step backwards in many countries.

The need was highlighted to establish a series of measures:

- to optimize the link among land management, risk management and lifeline services;

- to develop incentives for institutions to decrease the vulnerability of infrastructure networks;
- to adopt prevention and mitigation measures for the critical area service, in coordination with governments at different levels;
- to improve rates so they better reflect the real cost of services rendered;
- to train the human resources responsible for risk management and land use management in these basic service institutions.

General comments

A variety of professionals from several sub-regional sectors, namely health, education, and lifeline services, have a positive strategic view of land use management. It is seen as the way to build social space through economic policies that attempt to connect citizen demands and resource management.

The key to development, as understood today, arises from the synergy and intelligent articulation of factors that enable good decision-making. In this context, and based on knowledge and information, the actors must be capable of developing dynamic, safe, predictable and environmentally sustainable intervention scenarios.

These professionals believe that the effects on agricultural economics, infrastructure and settlements in general, doubtlessly require strong specific and sectoral measures that, in turn, are contained in policies and guidelines.

Concerning land use management, some of the essential tools have been disaggregated and developed into orderly information (significant progress has been made in this area), land aptitude documents, and human intervention tolerance maps for critical areas. The objective is to determine the connection between the current land use dynamics and the connection to human settlement systems.

Concerning risk management, the different sectors analyzed recognize the importance of considering the natural system in a relative equilibrium that results in critical human intervention relationships, which require permanent oversight of these processes. Some contributions leading to the good use and development of land use management and organization are the information systems related to natural, human, technological and production processes that cause catastrophes or disasters, multiple risk maps, definition of vulnerability indicators, and the identification of acceptable levels of risk.

The group agreed that local governments in most countries have the key to intervention, although at the same time they also face the greatest budgetary, legal, professional and technological challenges. Therefore, it is preferable to act decisively to turn weaknesses into strengths.

Recommendations

A strategic perspective of land use management should address the issues identified by the different sectors; however, it is necessary to recognize that each sector is part of a dynamic

process that includes serious conflicts. The solution of these conflicts requires negotiation, concertation and consensus of actors within and among sectors.

Each sector must be aware of the tools provided by land use management and the range of possible actions to undertake, since this approach-- complex, multi-disciplinary and comprehensive-- is currently under implementation locally, with significant difficulties. Each sector should analyze the usefulness of this approach, and urge the local authorities to include actions in their land use plans that benefit them. Vulnerability and the negative impacts experienced must also be taken into consideration, so as to reduce or overcome them.

With the support of science and technology, each sector may use multiple hazard maps and critical facility maps to define the organization of land components and the intervention strategies required to reduce risk at all phases of their sectoral programs.

Training must be strengthened through innovative strategies that favor building capacity and developing knowledge to guarantee the availability of human resources and baseline information to establish a permanent dialogue between land use management and risk management as a guarantee of sustainability.

Risk management courses for each sector should include land use management information as a tool to lower the vulnerability of territories and their components.

The individuals responsible for implementing land use management must coordinate the actions of all those protagonists responsible for developing rural and urban policies to deal with matters that affect the safety of sector members and foresee risk prevention or mitigation measures, determine the level of acceptable risk in each case and provide an integrated approach by developing actor-specific incentives.

Local, provincial and regional governments must ensure that budgets are adequate to carry out plans to respond to land use management requirements of sectors with risk management and vulnerability reduction programs. This reserve will help reduce the undesirable additional costs and will become a solid sustainability and budgetary instrument in new land use management scenarios.

Decision-makers must temporarily expand their horizons and acknowledge that the outcome of their initiatives and actions transcend their management periods, and continuously analyze the trends and risk scenarios, within the context of broad international challenges: globalization of the economy and integration processes that affect us all one way or another.

The dialogue between these two intervention perspectives must be streamlined and dynamic, and must be incorporated in state policies, to control and foresee the behavior of environmental, economic and social processes that delay development efforts.

Sectors dealing with risk management should strive to approach local government and participate in the development, organization and growth of its components, as well as the

development of its policies within the framework of land use management programs developed by these organisms. It is even more important to insist that these programs be created where they do not exist. One of the most important risk factors in most of these territories is precisely the non-existence of land use management plans, urban as well as rural. Having these is one way to guarantee that sectoral efforts are in line with the ever more sustainable and integrated responses and plans.

Risk management experts dealing with land use management knowledge must cooperate actively to disseminate that knowledge and to help increase the number of professionals that tap the benefits of a multi-disciplinary and multi-sectoral territorial approach to guarantee a more inter-related and participatory view over time. On the other hand, experts and technicians must learn how to sell their ideas to politicians and ensure that all decision-making includes risk management as part of land use management. In this case, universities and international organizations have a substantive role to promote the interaction and feedback between land use management and risk management.

DEMOCRACY AND DISASTERS³⁸

Introduction

Until a few years ago the connection between natural disasters and democracy was not very clear. However, a series of factors, namely political, social and economic, have made this relationship more clear, and have demonstrated the need to further study and reflect on this matter so as to work more effectively in areas such as prevention, education and adequate policy-making.

Natural disasters and their link to democracy fit within the framework of four characteristics that additionally explains the connection among natural disasters, politics, state and society.

First, the approach to natural disasters has undergone significant changes over the years, especially in recent times. The “nature-oriented” stance (disasters are uncontrollable events of nature, where only the mitigation of their effects is possible) has shifted to a “development-oriented” stance (natural disasters are such, depending on the relevant development model and how it may have been implemented by a given society, area or locality).

Second, public policies, traditionally focused on the role of the state in Latin America and the Caribbean, have proven to be insufficient and ineffective. Thus, society, the *object* of these state actions and policies, has gradually become the *subject* of development, resulting in the “rediscovery” of society, now seen as a civil society that looks for new forms of organization and means of expression, but that is also needed by the state itself. Consequently, public policies now respond to the notion of a public-private *mix* as the best way to reach society and ensure implementation.

Third, and in line with the previous point, the active and strong participation of civil society in the national, regional and global scenarios, be they political, economic or socio-cultural, has become an inevitable fact. Issues that transcend national boundaries, such as human rights, democracy, trade or environment, have fostered the evolution of a transnational civil society as a social and, eventually, political subject that tends to continue expanding its agenda. National disasters and their link to democracy are elements of this regional and hemispheric agenda.

Fourth and last, the global trend towards regionalism –as a means for countries with lesser weight to attain a better commercial and economic position and to strengthen their possibilities for political leverage-, has resulted in a series of sub-regional integration processes in Latin America and the Caribbean, and a more ambitious hemispheric integration through the Free Trade Area of the Americas (FTAA). These integration scenarios, originally for the commercial arena, seem to be appropriate to undertake actions

³⁸ Bruno Podestá, Ph.D. prepared this chapter, as a contribution to the discussion of the parallel plenary session on the issue.

and initiatives in other areas of interest to the governments and societies of the region. Therefore, the FTAA becomes an adequate framework in which to deal with natural disasters, which have so strongly affected the American hemisphere this last decade.

These four elements, or groups of elements, condition the relevance and scope of natural disasters in Latin America and the Caribbean, their link to democracy and the convergence between politics, government and society. They also make this link more relevant than ever before, and outline the framework of their possible relevance and scope.

Scope

The following three pillars determine the scope of the connection between democracy and natural disasters:

- Public policies, resulting from government actions to satisfy society and its needs.
- *Policy learning*, a mechanism to process past experiences and the possibility to make changes based on past lessons, and, therefore, improve the actions of government and society.
- Institutional protagonists, their role, profile, behavior and types of interrelations, as organized ways to participate in democracies.

Crosscutting these three pillars are contents of importance for Latin America and the Caribbean, such as poverty, the role of women, the strengthening of democracy, and the consolidation of the so-called *subsidiarity principle*.

The poorest sectors of society are normally punished the hardest by natural disasters, and, at the same time, natural disasters are a determinant of poverty in the sub-continent. Women, as members of a family or of a society, are in a more critical situation when it comes to poverty and, therefore, their role requires further strengthening and empowerment.

Social participation is the most important element to strengthen democracy, while families and communities face the consequences of natural disasters. Therefore, the communities themselves and civil society organizations are closest to problems and their solutions. Their participation and input in matters of prevention, risk management and crisis management is indispensable, and enhances the democratic experience.

Development by area

The political dimension of disasters

Natural disasters are political facts, in the sense that they have effects on politics as well as on policies, especially socio-economic effects. They are also political in that they result

from public policies designed and developed with specific regulations, budgets, implementation methods and management criteria.

Gender

The gender issue, that is, the social importance given to biological differences, and the social, political and economic roles of men and women, is an important part of the current international agenda for many reasons. During natural disasters, these differences are evident in the levels of training and the basic rights of men and women.

Within the communities, women stand out for fostering and implementing actions, and at the same time benefit from and are agents of change. They participate in mitigation activities, controlling vectors and environmental threats, implementing warning systems, giving advice and organizing. Additionally they participate in risk reduction and response activities.

Some experiences are based on the philosophy of respect and equality, giving the community the ability to discuss and act on risk management matters with a gender approach, considering the regional, national, provincial and local levels. When it exists, risk reduction planning identifies vulnerabilities, but does not usually provide guidelines to apply the gender approach, which is absent or negligible in technical activities and social dynamics of the community.

Although women are socially denied the role they should play, they end up strongly involved in community management. For example, men might formally be the recipients of donated equipment, but women will usually be the users. Women must go beyond the traditional areas of health, education and environment to also contribute in other areas like organization and management. It will not suffice for women merely to participate in project activities; opportunities within institutions, like the local governments, must also be opened to them.

The state, its structure and its policies

States usually focus on economic policies, which they normally respect and comply with strictly. Rarely is this the case with social policies, which are no longer *universal* but instead have faced *privatization*, making families and citizens responsible for them, depending on their ability to respond at the economic and socio-cultural levels.

Despite this, the neo-liberal economic policies implemented in most of Latin America and the Caribbean during the last decade and a half have proven to be useless in the fight against the widespread unemployment and poverty in the region. Social policies need to be “rediscovered” to put an end to social polarization and violence, and to decrease the risk of destabilizing the democracies in the region.

This more favorable scenario would permit the repositioning of natural disaster-related risk reduction and management efforts at a time of greater sensitivity to social policies. For this

to occur, however, civil society must find the spaces generated by inter-sectoral work in order to have an impact on pressing issues.

Lastly, the local levels within the general structure need to be strengthened, as well as their access and communication channels with intermediate levels, without forgetting community citizen organizations to generate and benefit from empowerment.

Democracy, development and risk reduction strategies

Risk and vulnerability reduction is essential to improve the levels of development. Clearly, a successful policy depends on generating a regional perspective from which to outline the national, sub-national and local efforts. However, the pressure and demands resulting from a huge disaster like Hurricane Mitch usually end up setting aside temporarily a regional perspective in favor of a domestic agenda and the resources required. National politics and politicians usually respond by setting priorities for the short term and for the national realm.

Conclusions

Lessons learned

Although there are still many shortcomings in the link between natural disasters and democracy, significant progress has been made and experience has been gained, resulting in lessons worth mentioning:

On political impacts of disasters: These are windows of opportunity to produce change, including the way that systems face socio-economic, racial and ethnic imbalances. Evidence of this is the post-Mitch period, where the magnitude of the disaster caused an organizational crisis that favored the participation of individuals that had never had a role to play in the system. Overall, these are windows of opportunity to introduce policies related to prevention and other aspects of natural disasters.

On gender: Most national planning institutions lack gender analyses, and, where they exist, the majority do not identify the specific populations in which to generate or produce changes or strategies to increase gender-related knowledge or to promote the empowerment of women.

On the state, its structure and its policies: Planning is an important function of the state, for its re-institutionalization and its institutional strengthening. While not ignoring response activities, the priority is prevention, management and risk reduction.

On democracy, development and risk reduction strategies: Several barriers have been identified:

- Culturally, institutions do not consider that prevention is a socially relevant attitude, and, instead, are used to only responding.

- When prevention budgets exist, the institutions need to ensure accountability to prevent corruption.
- Administrative discontinuity and staff turnover are obstacles that generate the loss of technical knowledge and institutional memory, delaying the implementation of risk management and reduction, and the related loss of resources.
- Civil society mistrusts politics and the deteriorated political parties. Therefore, the collaboration between the state and civil society leads to certain difficulties.
- Control entities are ineffective, do not know each other, do not coordinate and do not share knowledge among each other.

Innovative approaches

The pool of experiences in the American hemisphere allows highlighting some innovative approaches.

The *political impact of disasters* contains four elements of importance to society, and which serve to classify its political leaders:

- The ability of leaders to respond to disasters.
- Their ability to utilize the resources available.
- Their ability to ensure that the resources available are used correctly.
- Lastly, their attitude of compassion, regardless of the resources that the victims might receive. Citizens expect their leaders to be sensitive to the individuals and communities affected, and appreciate the demonstration of this sensitivity. The three-day absence of President De La Madrid after the 1985 earthquake in Mexico significantly weakened him and was one of the causes for his losing power a few years later.

On *gender*: The meaning of gender strategy or policy may not be very clear, but women continue to work in the community. The innovation lies in observing the daily activities of women to operationally thread those activities that enhance gender equality and that broaden the participation of women inside and outside of the community.

On *the state, its structure and its policies*: The risk reduction approach is innovative as the result of access to natural resources and systematic training.

On *democracy, development and risk reduction strategies*: The current approach focuses risk reduction efforts on sustainable development, and reconstruction implies transformation and the search for ways to eliminate any barriers to risk reduction

New trends

It is not practical to rue *political intervention* or, even worse, to complain about politicians and their attitudes in the face of natural disasters. Disasters have direct impacts or political repercussions. The strategy, then, must be to opt for taking advantage of the windows of opportunity resulting from disasters, to expand the diplomatic base and citizen participation in risk reduction and response.

On *gender*: The new trend implies being aware of and alert to non-exclusion, based on decentralization and social work, to secure democracy and success in risk reduction efforts, made operational through the daily action of women.

On *the state, its structure and its policies*: The current trend is to consider that the fight against poverty involves physical safety, urban development and housing policies, including norms to regulate the prevailing social conduct, such as land use, types of construction, and land apt for housing. Thus, the policies to fight poverty result in a link between the technical proposal and the appropriation/acceptance of those involved in self-construction processes. Work is undertaken at several levels, ranging from national to local. Success in risk reduction will be seen in sustainable cities with urban development and the appropriation of reconstruction technologies.

On *democracy, development and risk reduction strategies*: The current trend is to foster interest-specific development, searching for commonalities and for *win-win* negotiations that help strengthen democracy in the framework of sustainable development. Only this way will there be a clear and transparent plan of action for the medium and long term. Planning and the design of adequate policies will be useful to answer such questions as: What to do? How to do it? Who will do it? When to do it?

The risk reduction strategy does not imply institutional confrontation, but instead the establishment of new and clear institutional and social relationships between the state, the market and society. If the negotiation advances, conflict resolution will also advance. Only this way will public management become transparent.

The notion that “politics is dirty” hinders creating the necessary mechanisms for participation in decision-making. The agenda of social protagonists includes risk reduction as part of complex social and political dynamics. National, bilateral and multilateral institutions must redefine their paradigms, mission and vision statements, and, therefore, their new structures and resource organization. Once this happens, Socrates will regain relevance, reminding us that knowledge is to know that fire burns, but that wisdom is to remember the burn.

NATIONAL SYSTEMS³⁹

Introduction

In general, the creation of risk management organizations and emergency preparedness strategies in Latin America has been motivated by the occurrence of serious disasters. Civil defense or protection organizations, directed in most cases by active or retired military officials, have also been established in response to a disaster. With some exceptions, the scope of these organizations is national, with scarce presence at the local level, preserving the old paradigm of preparing for emergency response. Some organizations have made minor adjustments in their approach by recognizing the importance of risk reduction and stimulating a broader risk management process. Unfortunately, in the best of cases, entities from various sectors have engaged in new but sporadic activities without links to the local level and without proper direction and coordination.

Recently, some inter-institutional organizations have been created to seek a more integrated vision of risk management that ensures coordination between the national provincial and municipal levels to formulate and implement policies. These inter-institutional organizations, which are the exception rather than the rule, have made attempts to coordinate sectors to carry out both emergency response and prevention-mitigation activities. These types of organizations have been called "systems," and differ from traditional centralized models in that they originate in a network of institutions and act according to their scope of competence and authority. Coordination in this type of institutional organization is done in a decentralized manner by focal entities at each territorial level (national, provincial or municipal).

Despite the relative achievements, there still remain many centralized state structures with little participation from the private sector and civil society organizations. Their activities are typically excluded from political agendas and budget priorities. Deficiencies in professional qualifications and low-quality research capacities prevail, and have been immune to advances in scientific work, planning, and land use management. Coordination, in the best of cases, is carried out mainly at the national level, partially at the sectoral level, and scarcely at all at the local level.

These difficulties arise for various reasons, including the lack of political will, lack of conceptual foundations and sustainable and appropriate financial mechanisms, technical and political weaknesses of bureaucratic coordinating entities, and the gradual return to the emergency response paradigm.

It appears that, due to the lack of adequate conceptual and strategic support and consequent inability to coordinate sectors, some previously exceptional organizations are today no

³⁹ Omar Dario Cardona A., Ph.D., Academic Director of the Center for Disaster and Risk Studies (CEDERI) of the Universidad de los Andes, prepared this chapter based on the document "National Systems and Institutional Mechanisms for Integrated Risk and Disaster Management," which was a contribution to the discussion of the parallel plenary session on the issue.

longer exemplary cases. Although these situations originate from different causes depending on the particular circumstances in the country, these cases merit extensive analysis. Identifying weaknesses and obstacles, on the one hand, and accomplishments on the other, makes it possible to direct regional efforts so that they exert a positive influence on public policy-making that strengthens and fosters integrated risk management.

Scope

Disasters are an expression of the inadequate and fragile relationship between the development model and the environment. The reduction of vulnerability must be an explicit purpose of development, in the context of development as an improvement of not only living conditions, but of the quality of life and social well-being, which require a certain degree of individual and collective security. The general policy of the state, therefore, must strive to incorporate risk management into the nation's socio-economic development process to eliminate or reduce loss of lives and material and environmental goods.

Risk reduction, understood as the set of structures, processes, measures and tools aimed at reducing the hazard or vulnerability, plays a defining role in disaster management. Disaster management is the set of means, elements, measures and procedures used to intervene when a disaster occurs and it comprises the field of preparedness for disaster assistance and response.

The objective of risk management is to articulate the types of intervention, giving the principal role to prevention-mitigation, without abandoning intervention in the disaster. From the national perspective, risk management should not only be identified with the state intervention apparatus at different levels, but should also stimulate a national capacity to coordinate governmental and non-governmental forces. In this regard, a national risk management policy not only refers to the territorial identity, but also articulates the role of existing forces: social, political, institutional, public, and private at all territorial levels. This allows space for democratic participation, and joint efforts and responsibilities, according to each sphere of competence.

In-depth and systematized research conducted throughout Latin America and the Caribbean has revealed that in order to improve and effectively undertake integrated risk management, most countries in the region must take a number of steps:

- A new public policy on the issue. That is, a more integrated, efficient and effective policy on disasters that involves, apart from operational preparedness for emergency response, risk reduction from the development perspective. Policies must also redefine the foundations framing institutional actions and explicitly strengthen prevention-mitigation and post-disaster recovery within a strategy that emphasizes risk management rather than disaster response.
- Update legislation. There are many significant gaps in the legislation of countries in the region, even in those that have recently enacted changes. Many organizations are currently overburdened and unable to adapt to new challenges. Institutions must be modernized through changes in regulations to support conceptual advances in risk

management, and through the establishment of a strong legal base to support the institutions.

- Strong financial capacity. A greater allocation of financial resources is undoubtedly needed to improve the capacity to carry out risk management activities, particularly at the level of compensatory measures and prospective risk management. In addition, it is necessary to explore protection mechanisms, risk transfer and immediate availability of resources in case of an emergency, as well as subsidies and incentives to promote risk reduction.
- Promote initiatives at the local level. The risk management process must involve community organizations and associations to ensure the relocation of human settlements in areas of risk and to carry out environmental management and post-event recovery. The main strategies to foster community participation in prevention include the use of institutional strengthening channels and promotion of citizen participation.
- Create information systems. One of the most complex but essential aspects of risk management is the need for an integrated information management system that is decentralized, inter-institutional and coherent. Furthermore, the system must serve as the base of knowledge on the issue and facilitate inter-institutional decision-making on risk management.
- Strengthen training. Although for some time several operational organizations have promoted training initiatives for emergency response, it is necessary to conduct permanent risk management training at all levels of the institutional organization, using available tools and incorporating various entities.

In summary, although some countries improved their emergency response capabilities and supported partial installation of monitoring and alert networks, there is nonetheless a lack of research and techniques that allow dependable evaluation of risks. There is also a lack of systematic methodologies that would facilitate the inclusion of risks into development and land use management plans. In general, incorporating disaster prevention or risk reduction in planning is almost non-existent, although environmental policy guidelines have had a positive effect in this regard. According to projections, many countries will double their population in a period of relatively few years, which could mean a dramatic increase in vulnerability and risk, difficulty in the provision of public services, environmental deterioration and significant levels of poverty. Unless there is effective incorporation of prevention criteria in physical planning (urban and/or territorial), and in sectoral and socio-economic planning, a balanced and sustainable development process cannot occur.

A National Risk Management System

In order for an inter-institutional organization to be a *system*, its structure must support a group of interdependent entities that can also maintain their autonomy regarding their sectoral and territorial competencies and responsibilities. Their activities create synergy, as together they are more than the sum of the separate actions of the entities. The departmental or

municipal levels are different versions of the national organization and act in an integrated manner, in order to guarantee a coherent information flow and the execution of bottom-to-top or top-to-bottom programs as well as horizontally among the components at each level, whether these are governmental, private sector or civil society organizations.

Although the creation of integrated systems depends on the democratic and historical circumstances of each country, systems should in general be comprised of entities from the public and private sectors that can conduct management activities from technical, scientific, planning and operational perspectives. The inter-institutional risk management system should strive to define their functions and responsibilities at the national, departmental and municipal levels.

By promoting a decentralized organization that respects the autonomy of its components, risk management systems allow for implementation at either the local or municipal level. In contrast with the first-line and preeminent position of the municipality, the departments or provinces and the national entities are reserved for those situations in which, given the nature of the task, they must come to the aid of the municipalities. This configuration enables direct and participatory democracy and an adequate response to the specific conditions of administrative actions.

It is important to highlight that, although in each territorial stratum (nation, departments, municipalities) there are five functions or functional “systems” (decision, planning, control, coordination and execution) as defined by Stafford Beer⁴⁰ in “*Viable System Model*,” the municipalities must carry a greater weight in execution of not only risk management, but public management in general. Otherwise, recent statements of autonomy and decentralization are worthless. From this perspective, if the municipalities are the territorial level with a larger content of execution competencies (S.1 in Beer terminology), the departments arise by definition as the coordinating instances (S.2), that should assist and support the municipalities if necessary. Finally, the nation, through its various administrative manifestations (presidency, central sector, decentralized entities, external control entities), should abstain from executing the tasks that can be undertaken by the municipalities firstly or by the departments secondly. On the contrary, its resources should be channeled towards those functions that are better implemented by the central governments, such as: establishing general policies and making decisions pertaining to the system as a whole (in other words, directing, S.5 in Beer nomenclature); planning for the entire system and integrating the planning efforts emanating from the territorial entities, investigating the environment and the future and establishing links to the international supra-system (function S.4) and finally, monitoring the plurality of sectional and local administrations.

Ideally, the territorial system of the countries should strike a balance between the national unit and the autonomy of the territorial entities as a result of an effective decentralization. This has not been so given the effect of the dead weight of centralization, which is still evident in decision making and the chain of command of national authorities over local ones, particularly in the case of emergencies and disasters. Another concern is the economic,

⁴⁰ Beer, S., 1989.

administrative, and political weakness of many municipalities that justifies intervention by national entities.

As a consequence of the administrative centralization and the inactivity of local administrations, the territorial entities at the municipal level have tended to neglect their role as the implementers of prevention, mitigation and development. If it is not possible to condition the environment itself, due to the influence of external forces, any environment loses its sense of ownership. When a centralized source of power controls development and natural resources, responsibility and accountability become diluted and separated from the community level. The fundamental argument as to why the municipality should be responsible for habitat and environmental management, emergency preparedness, risk reduction and prevention, is the recognition the importance of regional and local efforts. This assessment originates with the citizens and is developed from the bottom up, in accordance with democratic rights and duties.

It is important to consider the objectives of a “*national risk management system*”: to reduce risk, manage disasters, and reconstruct with a balanced notion of development. Risk is at the core of these purposes as well as its materialization into disasters. Thus, it is necessary to recognize that a disaster is a convergence of facts, omissions, situations and conditions (vulnerabilities) that has a local origin in most cases. There are very few risks that are national or international in scope or disasters that affect areas larger than regions. Disasters and the risks inherent to them are limited to specific, concrete areas and populations. National catastrophes and calamities are, in general, crises that pertain to the political and economic spheres such as wars and depressions.

Disasters are pathological social conditions that can only be confronted socially, with the participation of those affected and with the intervention of the closest authorities (municipal), given the principle of immediacy. That is the reason why municipalities are the preferred level of implementation for risk management and disaster response. Therefore, in order to promote risk management, the existing institutional organization must be modernized to implement a National Risk Management System that brings public and private entities together that deal with the various activities related to risk management in the country. To this effect, it is necessary to form an institutional network, coordinated at the national level and replicated at the departmental (provincial) and municipal levels.

Guiding principles

Below are the proposed general principles to guide the actions of national and territorial entities related to a “*national risk management system*”:

- Decentralization: The nation and the territorial entities shall freely and autonomously exercise their risk management functions, strictly subjected to the responsibilities assigned under the constitution and the law. In other words, the “*national system*” should strengthen the decentralization process through which the municipalities and departments (and even other territorial entities that may be established) may autonomously assume their responsibilities. The national level is reserved for tasks such

as defining the policy framework, coordinating actions and executing support and subsidy activities.

- *Scope of competencies:* Risk management activities shall consider compliance with the criteria of concurrence, complementarity and subsidiarity.
- *Coordination:* National, departmental and municipal entities shall guarantee harmony, consistency, coherence and continuity of internal activities among sectoral and territorial bodies for the purposes of risk management.
- *Participation:* During risk management activities, the competent entities shall ensure that effective citizen participation procedures are in place.
- *Immediacy:* Local management is a priority due to the proximity between the administration and the community and the local nature of most disasters.

System structure and organization

General considerations

A “national risk management system” includes existing governmental and civil society entities at all territorial levels. The system undertakes risk reduction, emergency preparedness and recovery of affected areas, with the support of the national government and the cooperation of interested international organizations. These prevention-mitigation and disaster response activities are guided by a National Risk Management Plan that defines the system’s purpose and strategy, particularly regarding understanding risk, the incorporation of risk management in planning, institutional development of risk reduction and emergency response initiatives, public education programs, and training. These issues are promoted at the municipal, departmental (provincial) and national levels through inter-institutional cooperation and community participation.

Basic structure and hierarchy

In organizational terms, a System consists of several levels that function in a coordinated and hierarchical manner. Below are some suggested names and functions for various levels within a national risk management system (greater detail provided in the Annex).

- National Risk Management Council / Committee.
- National Risk Management Secretariat / Directorate.
- National Risk Prevention and Reduction Technical Council / Committee.
- National Emergency Operations Council / Committee
- Advisory or work commissions
- State, provincial, departmental and municipal risk management committees

National Risk Management Council / Committee. This coordinating entity is the most senior within the system, and integrates ministers, directors of national decentralized entities, and representatives of civil society. It should be chaired by the President or Prime

Minister of the country. This Committee executes political decision-making on risk management at the highest level within the government, and formulates national policy regarding all aspects of planning.

National Risk Management Secretariat / Directorate. This unit has administrative and financial autonomy, and reports to the Presidency of the Republic. It is composed of a general director or secretary and a permanent technical-professional body whose functions are to promote the execution of national risk management policies, to support and monitor the development of the national risk management system and its different functions, and manage the system's information systems. In addition, it could serve as technical secretariat for a risk management "*national fund.*"

National Risk Prevention and Reduction Technical Council / Committee. This plural coordination body reports to the National Secretariat / Directorate, and oversees the definition of short- and medium-term national risk reduction, prevention-mitigation, and reconstruction programs. It also creates and stimulates inter-institutional work commissions, and ensures the coordination and consistency of the plans of action formulated by those commissions. The committee proposes changes to the national plan and policy as deemed necessary. It should be composed of high-level technicians from institutions involved in risk reduction, and should be chaired by the general director of the National Risk Management Secretariat / Directorate.

National Emergency Operations Council / Committee. This collective coordination and execution entity reports to the National Secretariat / Directorate and defines the emergency response preparedness programs and sub-programs. It also promotes the formation of inter-institutional work or advisory commissions related with emergency operations, and ensures coordination and consistency of the national emergency plan. This committee should be composed of high-level technicians from key institutions involved in emergency response. In contrast to the previous committee, which focuses more on risk reduction, the national emergency operational council focuses more on preparedness and response.

Advisory or Work Commissions. Based on the priorities and actions proposed by the National Councils / Committees, permanent or temporary commissions could be created to work on the programs and projects of the national risk management plan or the national emergency plan. These commissions would be formed by all state institutions and civil society organizations playing a significant role in the associated area. Their functions would be twofold: first, to formulate a concrete plan of action for their area of competence and submit it to the corresponding National Council / Committee for consideration, approval and integration into the plans of other commissions; and second, to execute the actions described in the plans, with participation from the appropriate state, provincial, departmental and municipal committees.

State, Provincial, Departmental and Municipal Risk Management Committees. These committees would be chaired by the highest authority of the corresponding level (i.e., governor or mayor). The Committees formulate and propose their own risk management plans for their jurisdiction, with technical support provided by the appropriate national directorate, national committees, and work commissions.

A system constituted in this manner would have the following benefits:

- Integration into the National Planning System. The national risk management system plans and executes its actions from the perspective of national development planning. Its target image is risk management as a planning concept from the sectoral, territorial and economic and social development standpoint.
- Contribution to a balanced process of sustainable development. The system strives to balance the needs of the environment and the society within it, and design risk management strategies as preventive tools necessary to sustainable development.
- Synergy in the inter-institutional system. The structure of the national risk management system unites inter-dependent institutions that simultaneously preserve their autonomy. The results of the system are greater than the sum of all the disparate actions by its constituents. The inter-institutional committees in each municipality are smaller versions of departmental committees and these in turn are a replica of the national organization. The high degree of integration guarantees the flow of information and vertical procedures among state, provincial, departmental and municipal levels, and national in horizontal processes among the entities at each level.
- Decentralization. The main responsibility for risk reduction, emergency response, and reconstruction belongs at the municipal level. The state, provincial, departmental, municipal and national levels are complementary agents that advise and support local initiatives when the magnitude of the work or the breadth of the disaster is beyond its capacity.
- Coordination. A national risk management system does not duplicate the specialized functions of public or private entities, but coordinates their functions by clearly outlining institutional competencies and respecting the autonomy of municipal and departmental governments. The system creates a small team of territorial officials, with responsibility for coordination of specific functions (e.g., prevention, response, recovery).
- Participatory approach. The system does not form a substitute for the endangered or affected community, but links it to the tasks related to prevention, response and reconstruction. It is supported by the community's capacity for action and recovery and it strives to develop this capability.
- Political support. The coordinating authority receives support from the highest level of government and its constitutive law. Backing from high-level authorities provides a solid base on which to convene and unite the various institutions involved in risk reduction.
- Main emphasis of the strategy is on risk reduction. The system introduces the concept of risk in local, departmental, sectoral, and national planning, and expands beyond the traditional model of emergency response.

- Emergency response is determined by needs assessments. The response phase of the strategy seeks, on the one hand, to avoid congestion and an avalanche of superfluous assistance. On the other hand, it strives to overcome momentary or permanent gaps in assistance. The strategy clearly outlines the minimum basic elements that must be kept on reserve throughout a network of response agencies. Assistance provided is limited to concrete requests from municipal or departmental committees.
- No concentration of financial resources in a single entity. When compared to other alternatives, the system is relatively less intensive in financial resources and more organization-intensive. National, departmental and municipal entities must allocate resources in their annual budgets that would allow them to implement the appropriate preventive measures and, in the event of a disaster, to provide the necessary assistance.

It is important to point out that this type of system is based on various studies and developments in the region. Several countries are making adjustments to their institutions and there is a gradual shift towards an inter-institutional figure such as the one described here. Some countries have instituted this type of system years ago, and have begun new efforts to correct weaknesses and strengthen institutions.

Conclusions

Lessons learned

Prevention-mitigation requires inter-institutional systems that link public, private and civil society organizations across multiple disciplines and sectors to incorporate prevention and risk reduction into the institutional culture and models of sustainable development. For this reason, the institutional development of existing organizations must be strengthened to allow them to effectively manage not only emergency relief, but risk reduction and preparedness as well.

There is a great need for the planning processes of investment projects to incorporate prevention and mitigation strategies, not only in post-disaster reconstruction, but also in development programming across sectors. Therefore, risk management systems must ensure that prevention and mitigation are paramount considerations during the project planning stage, and must stimulate investments that reduce vulnerability and contribute to sustainable development.

High-risk areas generally co-exist with sub-standard economic and financial conditions in which family income levels are too low to obtain institutional housing credit, when it exists, or to relocate to a less risky area. There must be greater technical and financial support from government entities, the private sector and civil society organizations to protect these populations. An inter-institutional and decentralized risk management system can support the local level in this regard. Unfortunately, the majority of disaster management organizations in the countries of the region have not yet obtained this capacity.

Innovative approaches

Proper planning for disaster response requires thorough assessment of natural hazards, vulnerabilities and risk in disaster-prone areas. Without an adequate inter-institutional organization, resources are wasted, and research results are not utilized appropriately.

There must also be greater investment in projects that protect the environment and support the relocation of houses in areas at risk from flooding or landslides. Critical service buildings such as hospitals and other essential structures located in high-risk areas should be retrofitted to guarantee their operation at the time when they are most needed. The vulnerability of public service infrastructure such as water, power, communications and transportation should be reduced to prevent large economic and social losses. Damage to bridges, for example, can seriously affect a national or international transportation and trade corridor. Protection and retrofitting of schools have had some of the greatest social impacts. In addition, development projects, industrial enclaves and production media should be protected from the effects of natural phenomena. Construction codes must be written to reduce the effects of hurricanes and earthquakes, and land use management must identify risk areas for intervention.

Post-disaster reconstruction programs represent an opportunity to reduce vulnerability and to promote preventive projects for mitigating risk. This can help protect investments and prevent, for example, the need for reinvestment in infrastructure and housing. Experience has demonstrated that these programs should not be carried out by “all-powerful” state entities without the participation of risk management system institutions. Unfortunately, since existing disaster management organizations have dealt principally with emergency response rather than risk reduction, governments do not tend to rely on them for reconstruction programs.

New trends

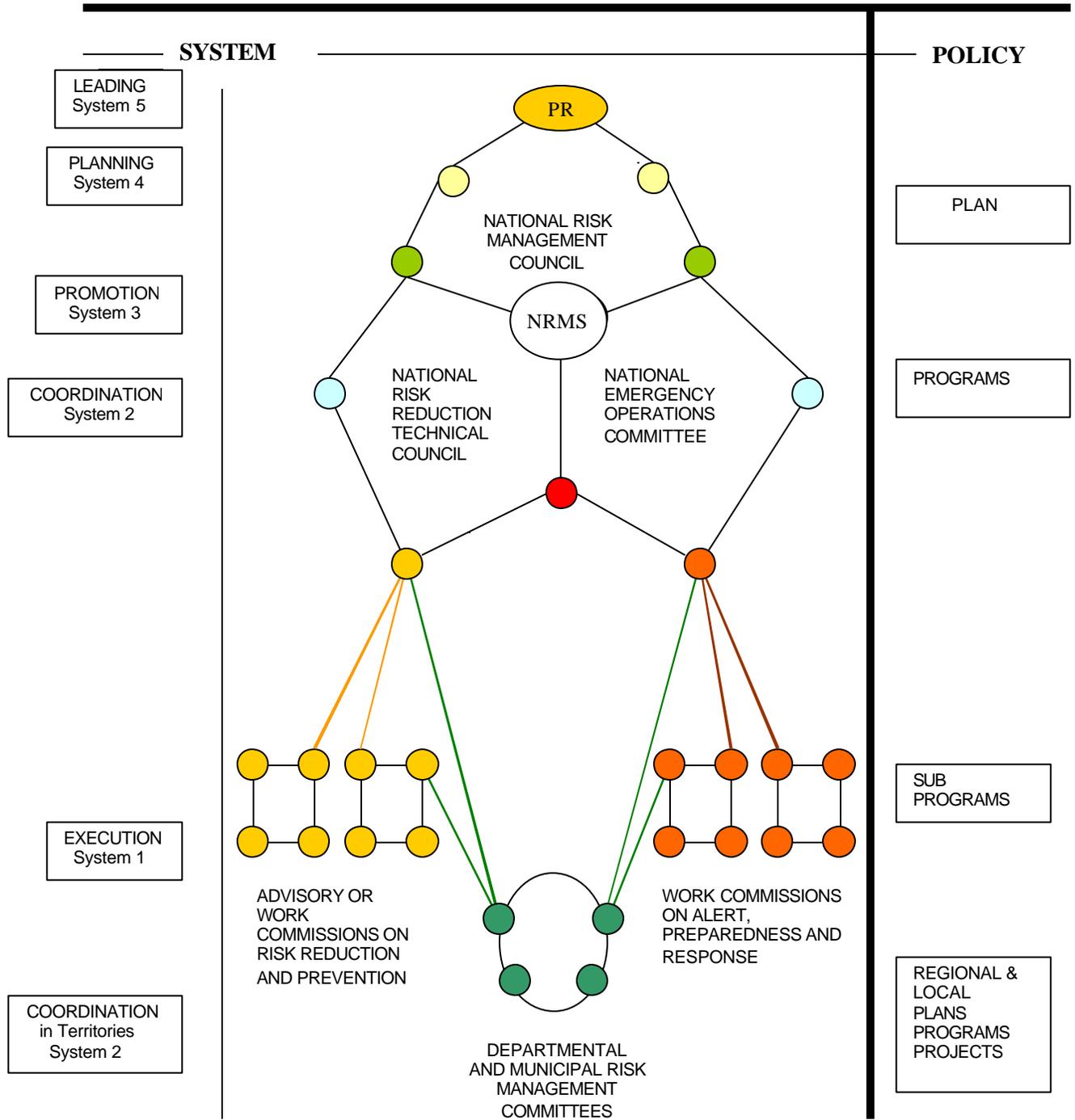
Joint efforts by regional organizations would bring together high-level officials responsible for developing public policy, guiding investment, and conducting sectoral and territorial planning. This would also help to ensure that the issue is appropriately considered by those who can positively impact the disaster management paradigm, and lead the advance from emergency response to risk reduction. Unfortunately, in the process of changing the paradigm, there are persistent difficulties in incorporating these two elements. The pressure of demonstrating short-term results also contributes to the inertia that affects many disaster management bodies. However, the creation of integrated and decentralized national risk management systems throughout the region, holds the possibility that countries may more effectively face a problem which at this point is growing significantly faster than the existing solutions.

ANNEX

NATIONAL RISK MANAGEMENT SYSTEM

NATIONAL RISK MANAGEMENT SYSTEM

Functional Articulation





Presidency of the Republic: Directs the system, presides and coordinates the National Risk Management Council / Committee, comprised by representatives of the highest political level of institutions and organizations. It is the governmental headquarters of the National Risk Management Secretariat / Directorate.



National Risk Management Secretariat / Directorate: Promotes, facilitates, provides follow-up and supports the preparation of policies, plans and programs approved by the National Committee.



Some institutions of the **National Risk Management Council / Committee** are not part of other System committees, but have other responsibilities in Government that are vital to all actions, such as financial or international relations, and have specialized functions within the state structure, but are not directly linked to any of the broad operations areas of the System.



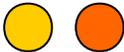
Some institutions are part of the **National Risk Management Council / Committee's** other System committees, so they serve as liaison, but in addition they bring to the attention of the National Committee any concerns or interests that arise in specific areas, including reduction and prevention as well as alert and response.



Some institutions or organizations are part of the **National Risk Reduction Technical Council / Committee**, but not of the **National Emergency Operations Committee**, since they focus on particular aspects including technical, professional, operational or executive specialties, and do not take part in the various program execution networks.



Some organizations or institutions belong to both committees, since they carry out essential tasks both in reduction and prevention as well as in alert, preparedness and response. These organizations are vital to the system and are the foundation of all its actions.



Institutions and organizations (public or private, regional or local) that comprise the **Advisory or Work Commissions** on risk reduction and prevention or alert, preparedness and response. They organize in the networks defined by the **programs** identified and as a function of the priorities determined by the National Council / Committee. They are linked with the National Technical and Operational Councils / Committees. Some of these institutions are permanent members of these National Councils / Committees and serve as liaison between them and the respective Commission or network, to ensure good information flow.



Regional and local, public, private, municipal or community organizations that comprise the **State, Provincial, Departmental and Municipal Risk Management Committees**, organized according to the priorities defined by the National Risk Management Council / Committee and the National Technical and Operational Councils / Committees and of the initiatives of the communities themselves. Their work focuses on actions linked specifically to the geographic, social, production and organization characteristics of the departments and municipalities.

They have links to the **Commissions** as well as with the **National Councils / Committees** and their organizations, so they can attend the meetings of the respective committees or work in integration with some commissions or networks, depending on the characteristics of the province or the programs that are being implemented in a given period.

PUBLIC AWARENESS AND INFORMATION MANAGEMENT⁴¹

Introduction

The shift towards a culture of prevention is only possible if the gap between the generation of technical-scientific knowledge, the management of political and technical standards and the social dissemination of information can be closed, in such a way that information can be transformed into knowledge and this knowledge, in turn, transformed into concrete decisions and social actions. Thus, it is important to link communication actions to strategies to prevent and manage disasters.

The concept of communication for disasters refers to a planned and articulated process that does not ignore any model or technical resource available. Its main purpose is to facilitate a dialogue among all social actors striving for a change in culture. Cultural changes occur in the sphere of the daily lives of people, where multiple communication processes occur. These must be considered when approaching the issue of the strategies.

Although information and communication can focus on any area, it is vital to the topic of risk prevention and reduction because these deal with the conservation and well being of the species and help ensure sustainable development.

Scope

Information management is important because the manner in which news related to risk is disseminated directly impacts the feelings generated or stimulated among the population.

At the same time, the sheer size of the population makes information very common while actual communication is less common. Consequently, there is no possibility of receiving feedback to know whether the message was understood or decoded as the issuer planned, nor is there the opportunity to reformulate it so that it is properly understood. The optimal strategy would be to insert disaster prevention messages into the daily information flow, thereby making this an every day issue in the development of a region, area or zone.

Another important aspect is the use of information and communication, including modern technology, to generate awareness or attitudes among the population that aid in reducing risk by reduced vulnerability.

Information and communication in support of a culture of prevention

Promoting a culture of prevention is the key to changing attitudes towards disasters and to undertaking risk reduction and prevention actions. This includes the need for mass dissemination of the main concepts that support preventive actions and raise awareness among the different sectors of national societies.

⁴¹ The Office of U.S. Foreign Disaster Assistance (USAID/OFDA/LAC) prepared this chapter taking into consideration the contributions of parallel plenary session speakers and subsequent discussions on the issue.

Mass communications media broadcast messages but do not have a feedback mechanism. They are valuable information channels in the process of generating citizen and public awareness and building a prevention culture on this basis. Collective communications media, to a large extent, determine the way in which people react to disasters, as the community depends on this information to make decisions.

In order to build this culture, it is necessary to disseminate technical scientific knowledge and political and technical standards, to facilitate popular ownership of this information, to provide differing opinions, and to facilitate the exchange of know-how among social actors.

It is important to undertake planned and permanent efforts so that technical-scientific information reaches the different sectors of society, mainly to those who live in high-risk areas. Professionals that manage information on disasters, particularly those in charge of disseminating it to the population (social communicators, decision makers and others), have an enormous responsibility.

Disaster reduction is a vital part of the prevention culture. It encompasses risk management and vulnerability reduction, hand in hand with sustainable development, protecting natural resources and eradicating poverty.

In order for disaster reduction to be effective, it must be multi-sectoral and interdisciplinary, with research components to update the knowledge and with permanent transfer of experiences, all facilitated by broad access to information. In this regard, it is important to relate or open channels of communication between scientific networks and the population, ensuring that the messages are transmitted in a language understood by the general population. Without a doubt, risk maps and dissemination of information are the structural measures necessary to strengthen or make constructions disaster-resistant.

At the community level, it is important to manage cultural characteristics so that messages can be accepted, understood and assimilated. Social responses depend on the political, historic and economic conditions in which disaster conditions evolve and a disaster occurs.

Conclusions

Lessons learned

If a vulnerable community is properly informed and educated, it can implement sustainable development measures that include risk reduction, taking into account the local and national economic growth and development.

Educational campaigns should achieve a state of awareness and social perception of the risk a population faces.

The potential of the mass media has been underestimated in risk management and therefore its contributions should be the subject of research and studies so they can be better utilized.

Innovative approaches

With adequate planning, the mass media not only can serve to inform the population about what is occurring but can also explain the significance of the facts and serve to advise and educate.

In order to influence the behavior of people facing a disaster, preventive information messages should be consistent and systematic.

Training for journalists and communicators in general on the subject of risk reduction will help improve the effectiveness of the messages. After the training, networks of journalists in the field of risk management should be created.

It is important to remember that science advances and knowledge changes. What can be the scientific truth at some point can be rejected and reformulated at a later stage. Public awareness must include these dynamics. If not, technical and scientific evolution cannot be assimilated by the community.

New trends

Modern Internet-based technologies (e-mail, web pages, real time communications) offer additional feedback channels. The Internet possesses an enormous value in the field of disasters, as it is capable of offering users exactly the information they need, organized according to their own requirements. It has simplified, streamlined and made access to information affordable, favored fast and low cost exchange, and facilitated the participation of geographically scattered groups and individuals, sometimes with different cultures and languages. However, it cannot be a substitute for the in-depth information contained in a book or a personal dialogue. Reducing the use of this technology to "I'm connected, therefore I exist" would be a mistake, for rather than contributing to a culture of prevention, it would actually reduce it. There is no exact dosis of technology. It depends on the needs, interests and limitations of the users. Technological excess or sophistication is not always positive; there are cases in which it can cause a project or initiative to fail if there is no adequate prior study of the existing conditions and capacities to assimilate and lend sustainability to the innovation.

In many cases, information dissemination strategies must be accompanied by supplementary techniques and instruments, sometimes traditional – libraries, print books, photocopies or workshops – or with other technologies such as CD-ROM that facilitate widespread use of electronic sources not available on the Internet.

In addition, the percentage of the population having access to this medium is still small and, therefore, it would be a mistake to concentrate solely on these options to accomplish risk reduction. However, some municipalities have begun to offer services via Internet that enable not only payment of municipal taxes or other administrative procedures, but that also contribute to raising citizen awareness. In some cases, for example, it is possible to obtain municipal risk maps, learn of weaknesses that need improvement, or become informed about the studies and monitoring of existing risks or early warning systems. This

is the case of the municipality of Chacao in Venezuela, where 80% of the educated population has Internet access.

There is a growing trend towards using existing information in messages and languages broken down by educational level, age, customs and needs, thus promoting ownership of the information and generating processes in which the informed communities or population groups can identify their vulnerability and the options for preventive management.

A national awareness-raising strategy should focus or concentrate public opinion on the effects a disaster could have on specific infrastructure or a specific population.

An understanding of the culture and interests of the beneficiaries must be improved so that they can actively share responsibility. Inasmuch as there is more than one actor, responsibility is shared.

The current challenge is not what should be said. There is almost universal consensus on this. The challenge lies in how, when and to whom to say it.

INTERNATIONAL PLAYERS⁴²

Introduction

When speaking about disasters in the Americas, we should refer to the players with a role in the scene: civil society, governments, national emergency systems, non-governmental organizations and international bilateral and multilateral organizations.

The history of international players in the area is recent. About 30 years ago –toward the end of the 1970s and beginning of the 1980s- a first movement begins. At that time, organizations such as IFRC, PAHO, and OFDA focused their efforts on response and preparedness. One coordination effort, the Pan-Caribbean Disaster Preparedness and Prevention project, constituted the first inter-agency relationship in the region. As was said before, efforts mainly addressed preparedness and response, and while prevention was a desirable goal, it was hardly attainable. The actions of these international organizations originated in their headquarters, but in the 1970s regional and national offices were opened in other countries, to be closer to the users.

By the end of the 1980s and beginning of the 1990s, another change was becoming apparent, brought on by the Mexico earthquake, that for the first time mitigation was included in risk management. Other non-traditional actors also appeared on the scene – such as the International Decade for the Reduction of Natural Disasters (IDNDR)- and the first inter-governmental initiatives were strengthened (CEPREDENAC and CDERA).

During this period we witnessed large magnitude disasters affecting several countries at the same time -El Niño, hurricanes Mitch and Georges- that led the international community to focus on mitigation. At the same time, international military organizations entered the scene -Southcom prominent among them- with activities aimed at preparedness and response.

Scope

There is significant inequality in the appropriation, transformation, use and distribution of resources between the developed and developing countries. The prevailing international economic and social order has certain mechanisms that attempt to reduce this disparity, all based in the creation of entities formed by two or more countries, acting either as states, represented by their institutions or banding together to develop trans-national organizations. The disaster field is no exception and in this field there are international players that, given their comparative advantages, can help countries and institutions with lower levels of development to conduct planning by objectives and to promote horizontal cooperation, allowing for knowledge exchange and experience sharing.

⁴² Chapter based on the presentations made by international organizations.

Development by organization

According to theories of international law, international cooperation is a foreign policy instrument of donors. However, this leaves room for those who manage the system to use their discretion in setting priorities and executing activities. In the risk management field, the changes in focus and priorities have been more evident and continuous than in others and this is not necessarily due to foreign policy. These changes are due to increased disaster and risk knowledge and management by the institutions and countries that benefit from the cooperation.

In conformance with the prevailing approaches, international players had, and many still have, mandates that limit them to response, making them unable to support other initiatives. In other cases, an assessment of technical and financial cooperation programs and projects has shown that financing disaster response does not really contribute to reducing poverty or favoring development. Given this situation, technical organizations had to struggle to change the institutional mandate or at least make it more flexible, which in some cases has been partially accomplished. However, the process towards a risk management and reduction trend still continues.

Following is a description of the actions that several international actors carry out in the disaster field in general and risk reduction in particular:

Deutsche Gesellschaft für Technische Zusammenarbeit GmbH (German Technical Cooperation Agency) - GTZ

Wolfgang Stiebens, (FEMID Project), www.gtz.de

GTZ field of action for risk management consists in advisory services for:

- Technical-political awareness-raising to achieve a better understanding of risk management from the standpoint of development cooperation.
- Integrated application of risk management: identification of hazards and vulnerability, prevention and early warning measures/activities and local, municipal, regional and national contingency plans.
- Promotion of local risk management as the basis for achieving effective risk reduction.
- Reconstruction that includes prevention and mitigation measures.

The FEMID Project (“Fortalecimiento Estructural Local para la Mitigación de Desastres”, Local Structural Strengthening for Disaster Mitigation)

This project, which was a joint initiative with CEPREDENAC, formally began in April 1997. The general objective of the first phase was to improve risk and disaster management response (Preparedness, Mitigation, Prevention - PMP) at the local and regional scale in Central America. The scenario has changed for the second phase: in pilot areas, local risk management experiences have been consolidated, the concept of local risk management has been considered regionally and nationally, the countries have begun the systematic application of local risk management concepts and methods at the various levels and sectoral regional and national institutions have adequate strategies and input for reducing disaster vulnerability and impact, applicable to local risk management.

Other projects carried out under the strategy used by FEMID are: Proyecto Prevención y Control Local de Incendios Forestales (PRECLIF, “Local Forest Fire Prevention and Control Project”), Petén, Guatemala; Proyecto Manejo de Riesgo Local en Ahuachapán, El Salvador (MARLAH, “Local Risk Management Project in Ahuacapan”); Feasibility Study and Design of the First Phase of the European Union DIPECHO program with LA RED, Andean Countries; Natural Disaster Recovery and Prevention, Piura, Perú; Risk Management and Food Security, Arequipa, Perú; Early Warning System, Río Piura, Perú; Local Risk Management in Six Municipalities, San Pedro del Norte, Bolivia; Risk Management and Food Security in the Río San Pedro Basin, Perú.

International Federation of Red Cross and Red Crescent Societies –IFRC

León Prop – www.ifrc.org

The mission of the International Federation consists of improving the situation of vulnerable persons by mobilizing the power of mankind. With its principles of humanity, impartiality, neutrality, independency, volunteer service, unity and universality, the IFRC represents a distinct message and the challenge is to transform these principles into actions.

Its programs focus on four areas defined in its strategy for the next ten years: promoting its humanitarian principles and values, disaster response, disaster preparedness, community health and relief.

It should be noted that the work it carries out at the community level to build local capacities has been done has simultaneously improved the capacity of the National Red Cross and Red Crescent Societies to provide effective response in adverse events. At the regional level, the Pan American Disaster Response Organization (PADRO) has been established and consolidated. This unit has a logistical base and includes specialties such as telecommunications, relief, and water and sanitation.

Currently it is placing particular emphasis on analyzing risk, vulnerabilities and capacities, taking a participatory approach and working directly with local communities and authorities.

Inter American Development Bank – IADB

Kari Keipi – www.iadb.org

The institutional strategy of the Inter-American Development Bank involves aspects such as: reform of the social sector, modernization of the state, competitiveness, regional integration, reduction of poverty and environmental improvement. All of these issues are somehow related to disaster prevention and mitigation. For example, by reducing poverty, the number of groups more susceptible to suffering the consequences of disasters is reduced; by increasing competition in the region, the production component is stimulated, thus diminishing interruptions caused by disasters.

In the last four years, the IADB has made more than \$1.5 billion dollars available for natural disasters, mainly for reconstruction. In recent years, there has been a change towards prevention and mitigation, and prevention is considered an investment. The IADB President presented a plan of action for 2000 that includes elements aimed specifically at risk management, such as: correcting structural and non-structural vulnerabilities, developing comprehensive risk management strategies, reducing vulnerability and protecting the poor, increasing private sector and civil society participation, coordinating international funding, mobilizing resources from existing funding sources (banking system, specialized funds, development funds -social, municipal and urban- and environmental funds), and developing new financial mechanisms (catastrophic bonds and insurance).

The IADB also has funds that can be destined for risk reduction and management and disaster recovery, in amounts ranging from \$5 to \$10 million, which can be combined into a single project.

Caribbean Development Bank – CDB

Cassandra Rogers – www.imf.org/external/np/sec/decdo/cdb.htm

In the mid-1990s, the Bank revised its disaster management policies and procedures, and in 1998 approved its Operational Strategy and Guidelines for Natural Disaster Management. Despite the fact that the guidelines include preparedness, mitigation and response, most of the Bank's interventions have been in response, which includes three types of technical assistance: immediate relief donations for a maximum of US\$100,000 for damage assessment, emergency response loans for clean-up and service restoration for up to US\$500,000, and rehabilitation loans subject to a detailed damage assessment by Bank officials.

In an attempt to strengthen the regional disaster mitigation capacity, the Bank has recently established, jointly with USAID/OFDA, a disaster mitigation unit for the Caribbean. Its two objectives are: to become associated with the member countries to develop and implement mitigation policies and practices, and to strengthen the Bank's internal capacity to integrate disaster mitigation into policies, programs and projects.

The Bank plans to finance projects to develop and implement mitigation policies in the countries (most important), community preparedness and prevention programs, natural hazard mapping and risk assessment, critical infrastructure vulnerability studies and retrofitting, public information programs on hazards and mitigation, training programs, etc.

The Bank recognizes that the cost of mitigation within development projects is relatively low in comparison to total project cost. It believes that the region needs to change the preparedness and response paradigm and focus instead on mitigation.

Pan American Health Organization/World Health Organization – PAHO/WHO

Jean Luc Poncelet – www.paho.org/disasters

PAHO/WHO has worked directly with each one of the countries in strengthening national health sector institutions. The focus has shifted from preparedness and emphasizing activities prior to the occurrence of disasters to strengthen sector response, to prevention-related activities. These measures include involvement in the analysis of structural, non-structural and functional vulnerability of health facilities and more recently of potable water and sewage systems. These preventive measures will complement other mitigation activities linked with sustainable development activities in other areas.

In the health area, PAHO/WHO has supported the creation and development of Disaster Reduction Units in Health Ministries and has promoted inter-sectoral cooperation with civil protection, military forces, education sector, ministries of foreign affairs, communication media, legislative bodies, private sector, NGOs and others. It has recently fostered closer links with financial institutions such as the IADB and the World Bank.

Human resource development and training continues to be one of the basic pillars for the sustainability and continuity of these activities and has been promoted through incorporation of the topic into university curricula. These activities have been reinforced by the publication and distribution of technical documents and periodic newsletters, which are disseminated electronically, and through the Regional Disaster Information Center “CRID,” located in Costa Rica, which is a partner with PAHO/WHO.

Another function is the coordination of humanitarian assistance in the health sector after any major emergency or disaster, and strengthening the relationship with other United Nations agencies, the Inter-American System, NGOs and donors. It has fostered the use of “SUMA,” an instrument that promotes fiscal transparency and accountability for countries managing material resources of their own or receiving foreign donations.

United States Agency for International Development – USAID

Robert Kahn – www.usaid.gov

USAID Missions support the different countries of the region in development programs in the areas of health, education, democracy, environment and economic development. It is customary for USAID to participate in situations where hazardous situations have been detected or where disasters have occurred. The Missions have maintained good relations with national counterparts responsible for disaster management and contribute in areas such as damage assessment, impact evaluations, and technical assistance to propose the most appropriate and efficient response. Hurricanes Georges and Mitch resulted in unprecedented action in the area of disasters, whereby the United States Government contributed more than US\$1 billion and involved 13 federal agencies that actively participated in the recovery of the affected areas.

In the area of prevention and mitigation for the post-Mitch recovery process, USAID committed to the CAMI initiative for a period of over two years. USAID Missions are analyzing the lessons learned and starting a process to incorporate the risk management concept into their regular development programs. This initiative has the support and encouragement of the current USAID Director.

The risk reduction area involves a range of aspects that range from public policies, land use regulations, environmental management aspects, and the application of high technology systems, which add to participatory processes based on community and grass roots actions that provide the necessary foundation.

Office of Foreign Disaster Assistance – OFDA

Juan Pablo Sarmiento – www.ofdalac.org

As part of USAID, OFDA follows its general policies. The goals established by OFDA within the institutional proposal are: to save lives and reduce human suffering, to reduce the social and economic impact of disasters, and to facilitate the transition towards rehabilitation and reconstruction as soon as possible.

OFDA's strategic objective is to satisfy the critical needs of vulnerable groups compromised in emergency situations, by making available assistance for response and rehabilitation and by strengthening the capacity to provide humanitarian relief. The strategy is based on the premise that a fast, efficient, and well-directed response can stabilize the situation of disaster victims, thereby reducing the need for external assistance to a minimum and fostering rehabilitation and reconstruction.

The intermediate results of this strategic objective can be summarized as follows:

- Improved emergency assistance delivery to the most vulnerable groups.

- Emergency assistance in compliance with accepted standards and received by disaster victims in a timely manner.
- Protected or reestablished capacity to earn a living.
- Growing adoption of mitigation measures in countries at greatest risk from natural or man-made disasters.

The means available are: disaster response, technical assistance, training and financing. Of equal importance is its role of catalyst, as an external agent that can convene national and international players to achieve a common goal.

The Central American Mitigation Initiative (CAMI) after hurricane Mitch allowed the strengthening of the institutions involved in risk management processes; facilitating and generating greater participation by the private sector, special interest groups and other donors in the development of risk management programs; incorporating risk management concepts in specially vulnerable local development programs; strengthening national legal frameworks; strengthening hazard monitoring systems, promoting the use of standard methodologies for capturing and analyzing data and information, and stimulating innovative proposals to implement mitigation measures in accordance with Central American needs and opportunities.

After several decades of uninterrupted work in disaster management and more recently in risk reduction, OFDA recognizes there are windows of opportunity for mitigation:

- Evident risk situations, where it is possible to identify the hazards and particular conditions of vulnerability sufficiently in advance so as to take measures to address the associated risk factors.
- Disaster response or recovery processes, characterized by the existence of irrefutable facts that lay bare the nature and characteristics of the hazard and the vulnerabilities, and accompanied by political sensitivity and social demands.
- Development processes where promoting the inclusion of the risk concept as an additional factor in feasibility studies can help mitigation reach the optimum levels of risk reduction and in some cases even help in prevention.

Organization of American States – OAS

Stephen Bender – www.oas.org

Since 1983, the OAS Sustainable Development and Environment Unit (UDSMA) has provided technical support to Member States in reducing vulnerability to natural hazards and in preventing disasters and mitigating their effects. Its activities, assistance in the formulation of policies, hazard and vulnerability assessment, training in disaster mitigation techniques and formulation of mitigation measures for investment projects, are generally carried out as part of technical cooperation programs with national, regional and international institutions. In recent years, OAS has created a series of

mechanisms to support its Member States in natural disaster reduction. These mechanisms consist of :

- Inter-American Committee for Natural Disaster Reduction (IACNDR)
- Inter-American Committee for Emergency Situations/Inter-American Fund for Emergency Situations (FONDEM)
- The Special Multi-Objective Fund of the Inter American Council for Integrated Development (FEMCIDI)
- Inter-American Commission for Sustainable Development (CIDS)
- The Inter-Agency Task Force for the Bolivia Sustainable Development Summit (IATF) and the Quebec City Summit
- General Secretariat Cooperation for Development

IACNDR, created by the OAS General Assembly by resolution GA/RES. 1682 (XXIX-O/99), is the hemispheric forum for strategic policies and actions and for the coordination of the inter-American system for natural disaster reduction, which in turn includes mechanisms for humanitarian assistance, disaster reduction financing and vulnerability assessment. Specifically, IACNDR is preparing a disaster reduction strategy for consideration of the Member States.

The Inter-American Committee for Emergency Situations and FONDEM are in consultation with the American community in cases of declarations for international assistance and FONDEM contributions.

FEMCIDI acts through its Annual Programs Fund, the Special Funds for Requests and Horizontal Cooperation. The latter consists of support among the Member States, the U.N. White Helmets Program and specific donations.

CIDS contemplates the Inter-American Program for Sustainable Development (PIDS) and resolution CIDI/CIDS/Res.5 (II-O/99), of the Inter-American Council for Integrated Development (CIDI). It requests reports from economic and social sectors regarding achievements in natural disaster reduction and asks IACNDR to inform CIDS about the strategic policies and actions of the Inter-American system to promote sustainable development in the Americas in the area of natural disaster reduction.

Follow-up to the Sustainable Development Summit Conference in Bolivia/IATF and to the Quebec City Summit, led to a Plan of Action including disaster reduction initiatives, and the Development Agency Task Force that includes a special group of reducing disasters through development.

The General Secretariat Cooperation for Development includes regional programs with national activities in the transportation and education sectors, vulnerability in coastal and border areas, hydrographic basins, trade corridors, basins in Central America, sectoral vulnerability assessments and strategic actions of hemispheric plans.

Conclusions

Lessons learned

The international organizations' actions are closer to beneficiaries of the cooperation.

Some international players used to condition the processing of disbursements or assistance to a declaration of emergency. They did not consider that in some cases this declaration had negative and unjustified secondary effects in reducing demands for tourism or trade. Consequently, this requirement is no longer in force or has been substituted by other commitments from the assisted country.

In the last ten years, the increase in disasters and damage has been very significant, reaching 20 billion dollars. In North America, one third of the damage was covered by insurance, while only 9% was covered in Africa and just 4% in Latin America. This provides a field of action for the insurance market and the potential to lessen the impact on affected countries.

Some mandates are becoming more flexible for accessing loan awards, non-reimbursable portions earmarked for shelters and evacuation plans, training and education, and information and awareness raising. In other cases these aspects are included in the reimbursable portion of the loan.

Some project evaluations have led to the conclusion that an efficient system requires a combination of high and low-tech efforts. The latter are also effective and, in the mid- and long-term, contribute to keeping the system within manageable investment limits for donor countries.

The large number of international actors working in the field can cause duplication, as they do not seek consensus on what each will do and many want to continue what they have always done.

Innovative approaches

Towards the end of the 1980s, mitigation activities began to appear, particularly for structural vulnerability. Some governments have re-focused organization mandates towards mitigation, preparedness and prevention.

The effects of disasters region-wide in a relatively short period of time gave rise to a change in attitude and reflection that led to greater commitment to prevention.

In recent years, military forces have entered the field of disasters, through the United States Southern Command, which works in preparedness and response.

Some international players will soon incorporate prevention and mitigation among the criteria for project financing. In other cases, selection criteria will include: a) integration of

local management as a process, b) raising awareness about the notion of risk and prevention methodology, and c) cross-border work in countries with small territory and population.

Other international actors, without officially changing their mandates, have begun to broaden them in practice, adding flexibility to the interpretation of the parameters of prevention, getting closer to a risk management and reduction perspective, even aiming part of their efforts at reducing foreign dependency through the coordination and optimization of internal resources. This is linked to development policies in its use of response, technical assistance, training, and funding, and can become a catalyst or stimulator for optimizing resources to accomplish the activities that can be carried out with internal or local resources.

New trends

Reality tells us that it no longer makes sense to speak about a program, but rather about a corporate or institutional vision that deals with risk management and reduction. This is just starting and is part of the new paradigm and the transition we are living.

More committed actors are required to strengthen local capacity, accelerating and continuing the decentralization processes of international agencies and NGOs and developing a more grounded, interactive and solid concertation process.

There is a need for specialization and more depth in international players so that efforts are not duplicated and so that countries can clearly know whom to turn to in case of specific needs. In addition, complementarity should be improved through memoranda of understanding (“partnerships”), relations, joint committees, etc., so that countries can benefit from them.

Based on the experience acquired, some international actors are considering applying minimum standards to the support they provide to an activity, program or project. Among these standards are: a) transparency, b) accountability, c) citizen participation, d) decentralization, e) environmental concerns.

Other international players have decided to do away with rules imposed by headquarters in favor of active coordination between donors and executors that benefits both, varying or improving legal frameworks and monitoring systems.

Windows of opportunity shall also be taken advantage of in the shift towards risk reduction in evident risk situations and post-disaster actions so that things can be different in the future and the concept of risk will be promoted as a factor in feasibility studies and even in prevention.

One of the aspects still being studied is the lack of information exchange, given the feeling that there is competition for the limited funds of few donors to carry out similar work. Some donors have tentatively proposed forming consortia to seek funds, but this is only a palliative measure. The solution requires new fund distribution mechanisms aimed at strengthening relations and at fostering solidarity.

There is also a tendency to study how to vary fund distribution according to the success of risk management and reduction, which is not easy. Under the paradigm response, more money is awarded to whomever has more disasters, more damage and more victims. But if someone is efficient in reducing risk, what parameters do we use to measure the magnitude of the damage that was avoided? How do we assign resources? The mechanism has evident faults, but it attempts to distance itself from the scheme that rewards those who suffer the consequences of what we do not want to occur. This is the challenge of changing the paradigm.

There is also a new trend to find mechanisms to create bridges between international actors and local governments, because their mandates require negotiation with the central governments. This creates a natural relation and the basis for risk reduction, which is found in decentralization and work at the local and municipal level.

There is a tendency among institutions to generate changes in the vision of how to approach the issue of disasters, no longer thinking about a program as a unit inside an institution, but rather with a more corporate and cross-cutting vision.

Conclusion

It should not be forgotten that international organizations have funds available for loans and donations, which opens a window of opportunities. In this scenario and given the economic conditions of the countries in the region, we are obligated to optimize the use of resources and utilize them in projects that will result in reducing risk to assist in the integrated development of the region.

The changes foreseen and the actions to implement them are now better defined. It is everyone's job to provide continuity to the implementation process. Today we face a great risk with severe consequences if our development trends are not modified, if we don't reduce vulnerability, if we don't act on poverty levels, and if we don't use all development means available to reduce risk and the impact of disasters.

The hemisphere is changing. The reduction of risks and of the impact of natural disasters is part of these changes and it is expected to become a reality that will benefit all peoples in the Americas.

GLOSSARY

Hazard

CRID: Probability of a natural or man-made phenomenon occurs at a specific time and in a specific place.

(Potential) danger of human lives or goods suffering harm or damage.

Possibility to which the inhabitants of a specific place are exposed.

UNDP: Hazardous event, or probability of a potentially harmful event occurring in a given area and at a specific time.

OAS: Denominated "natural hazards", these are all atmospheric, hydrologic, geologic (specially seismic and volcanic) or fire-caused phenomena which, by reason of the place where they occur, their severity and frequency, may adversely affect human beings, their structures or activities. Other "hazards" are caused by human beings, such as wars, pollution and chemical contamination, or hazards not necessarily related to the physical environment (such as infectious diseases).

LA RED: Omar Darío Cardona adopts the UNDRO (now DHA) definition, i.e., the probability of a potentially disastrous event occurring during a certain period of time in a given site. It is considered to be a synonym of threat.

OFDA: External risk factor, represented by the potential occurrence of a natural or man-made event of a given intensity and duration in a specific place.

PAHO: External risk factor of a subject or system, represented by a latent danger associated to a natural or technological physical phenomenon occurring in a specific place and at a given time, producing adverse effects on persons, goods or the environment, mathematically expressed as the probability of exceeding the level of occurrence of an event of a certain intensity in a specific place and during a given period of time.

Vulnerability

CRID: Extent of loss (0 to 100 percent) resulting from a potentially damaging phenomenon.

UNDP: Extent of loss (0% to 100%) resulting from a potentially damaging phenomenon.

LA RED: Omar Darío Cardona adopts the UNDRO (now DHA) definition, i.e., the extent of loss of an element or group of elements at risk resulting from the probable occurrence of a disastrous event.

In other article it is defined as the level or extent to which an exposed subject or element can be affected when it is subject to a hazard, wherein the threatened subject is part of the social or material context of a community. For Gustavo Wilches-Chaux it is the lack of capacity of a community to "absorb", through self-adjustment, the effects of a given change in its environment. It is inflexibility to change. It is the incapacity of adapting to change, which for the community, for the above-mentioned reasons, constitutes a risk.

OFDA: Internal risk factor of a subject, object or system, exposed to a hazard, corresponding to its intrinsic disposition to be damaged. In other words, it is the degree of strength exhibited by the subject, object or system when confronting a given event; thus, if this susceptibility to be damaged is large, it is said it has high vulnerability or, to the contrary, that it has low vulnerability.

PAHO: Extent of loss of an element or group of elements at risk resulting from the probable occurrence of a disastrous event, expressed in a scale of 0 or no damage to 1 or total loss.

Risk

CRID: The probability that an event will occur. Includes a variety of measurements of the probability of a generally unfavorable result. It is the number of human losses, injured persons, damaged property and interruption of economic activities due to specific natural phenomena and therefore, the result of specific risks and elements of risk.

UNDP: Mathematical calculation of loss (of lives, injured persons, damaged property and interrupted economic activity) during a period of reference in a given region for a specific hazard. Risk is the result of hazard and vulnerability.

OAS: Probability of loss.

LA RED: O. D. Cardona adopts the UNDR0 definitions. Specific risk is the extent of losses expected due to the occurrence of a particular event and as a function of a hazard and vulnerability. Total risk is the number of human losses, injured, damaged property and effects on economic activity due to the occurrence of a disastrous events. In another article, the same author defines specific risk as the probability of exceeding a level of social, economic or technical consequences in a certain place and in a certain period of time, and total risk as the cumulative quantification of the specific risk of each one of the subjects or elements exposed.

OFDA: Probability of exceeding a specific value of social, environmental and economic damages, in a specific place and for a given time of exposure.

PAHO: Expected loss or destruction obtained from the convolution of the probability of occurrence of hazardous events and of the vulnerability of the

elements exposed to such hazards, mathematically expressed as the probability of exceeding the level of economic and social consequences in a given place and for a certain period of time.

Prevention

CRID: Activities designed to provide permanent protection from a disaster.

UNDP: Activities designed to provide permanent protection from a disaster. Includes engineering and other physical protection measures, as well as, legislative measures for controlling land use and urban management.

OFDA: Phase where all alternatives to eliminate risk are investigated, whether by preventing occurrence of the event or eliminating the damage that may be caused by it.

Mitigation

CRID: Measures taken in advance of the disaster, for the purpose of reducing or eliminating their impact on society and the environment.

UNDP: Measures taken in advance of the disaster, for the purpose of reducing or eliminating their impact on society and the environment.

OAS: Reduction of the vulnerability of the elements at risk.

LA RED: According to Andrew Maskrey, these are measures that may be taken to minimize the destructive and disruptive effects of hazards and thereby lessen the magnitude of the disaster.

For Gustavo Wilches-Chaux it is the reduction of vulnerability.

OFDA: Phase of development of all actions aimed at reducing the effects emanating from the occurrence of a risk. That is, concretion of measures that reduce the consequences caused by a given event, trying to reduce to a minimum the damages they produce or implementing actions to avoid the event.

PAHO: That done before an event to reduce or prevent the damages it may cause.

Preparedness

CRID: Activities designed to minimize loss of life and damage, to organize the temporary movement of persons and goods from a threatened place and to provide them, during a rescue period, relief and rehabilitation.

UNDP: Activities designed to minimize loss of life and damage, to organize the temporary movement of persons and goods from a threatened place and to provide them, during a rescue period, relief and rehabilitation.

OAS: Actions taken in advance of the event and special activities during as well as immediately after it, aimed at minimizing the loss of life and property.

LA RED: For Gustavo Wilches-Chaux it is the reduction of the negative effects of a disaster. Seeks maximum reduction of the duration of the post-disaster emergency period and, therefore, to accelerate the start of the rehabilitation and reconstruction phases.

OFDA: Phase that structures the set of measures and actions to reduce to a minimum the loss of human life and other damage, through timely and efficient organization of the response and rehabilitation.

Response

OFDA: Actions taken in an adverse event for the purpose of saving lives, reducing suffering and reducing property loss. Phase where an immediate reaction takes place for the timely assistance of the population that suffers a severe change to their life patterns, caused by the emergency.

Rehabilitation

CRID: Recovery (to the maximum extent possible) of a person or persons suffering from disease or injury. Operations and decisions made after a disaster for the purpose of restoring an affected community and return it to its living conditions, fostering and facilitating the adjustments necessary for the change caused by the disaster.

UNDP: Operations and decisions made after a disaster for the purpose of restoring an affected community and return it to its living conditions, fostering and facilitating the adjustments necessary for the change caused by the disaster.

OAS: Restoration of the normal functions of public services, trade and business, repair of housing and other structures, and restart of productive activities.

OFDA: Transition period that begins at the end of the response phase, and includes short term restoration of vital basic services. This is the start of the gradual recovery of the services affected by the event and at the same time, the rehabilitation (physical, social and economic) of the damaged area.

Reconstruction

CRID: Addresses rebuilding, zoning, construction codes, technical inspections as well as financial and urban development. Actions taken to reestablish a community after a rehabilitation period following a disaster.

UNDP: Actions taken to reestablish a community after a rehabilitation period following a disaster. Actions would include construction of permanent housing, total restoration of all services and total return to pre-disaster status.

OFDA: Process of mid- and long-term repair of the physical, social and economic damage, to a level of development equal to or higher than what existed prior to the event.

Catastrophe

UNDP: In French, it is the equivalent of disaster. Synonym of disaster.

Disaster

CRID: A serious interruption of the functions of a society that causes extensive human, material or environmental losses, at a level sufficient for the affected society not to be able to overcome it on its own.

UNDP: A serious interruption of the functions of a society that causes extensive human, material or environmental losses, at a level sufficient for the affected society not to be able to overcome it on its own.

OAS: Natural disaster is a natural hazard that causes an unacceptable number of losses or property damage.

A hazardous event that causes fatalities and/or serious damage beyond the capacity of a society to respond..

LA RED: According to Gilberto Romero and Andrew Maskrey: natural disaster is the correlation between hazardous natural phenomena (such as earthquakes, hurricanes, tsunamis, etc.) and certain vulnerable socio-economic and physical conditions (such as precarious economic situations, bad housing construction, unstable soil types, bad housing location, etc.)

Omar Darío Cardona defines it as an event that, in the majority of cases, occurs suddenly or unexpectedly, causing intense alterations over the elements subject to it, represented by loss of life and health of the population, destruction or loss of collective goods or severe damage to the environment.

OFDA: Intense alterations to persons, goods, services and the environment, caused by a natural event or generated by human activity, that exceeds the response capacity of the affected community.

Adverse event that exceeds the response capacity of a community.

Emergency

UNDP: Sudden and unexpected event, that requires taking immediate actions to minimize its consequences.

OFDA: Adverse event that does not exceed the response capacity of the affected community

Urgency

OFDA: Sudden situation requiring immediate attention.

Disaster Management or Disaster Administration

CRID: Body of administrative policies and decisions and operational activities in the different phases of the disaster at all levels.

UNDP: Body of administrative policies and decisions and operational activities in the different phases of the disaster at all levels.

OFDA: Social system component constituted by the planning, organization, direction and control of activities related to disaster management in its any of its phases.

Phenomenon

OAS: Used as a synonym for hazard and for event.

Adverse event

OAS: Physical event is a natural phenomenon that, in fact, does not affect human beings because its effects do not enter in contact with them. It is a natural phenomenon that is not considered a natural hazard.

OFDA: Intense alterations to persons, goods, services and the environment, caused by a natural or man-made event. It can be an emergency or a disaster.

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