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A. Introduction

It is a paradox that, at the time when such an extraordinary effort is underway to elevate the sophistication, safety, and comfort of our societies, our vulnerability to natural hazards is in fact increasing.

Exposure to the risk of 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, the ill-considered sites and construction materials used to build critical facilities, weak local organizations, lack of social protection measures, inadequate access to education and health services—these and other unfavourable conditions are all associated with poverty or the unequal distribution of wealth or opportunities. Increasingly concentrated populations, the migration of many people to live and work in areas at greater risk from natural hazards, changing landuse pattern, growing demands on natural resources and often fragile ecosystems, and the consequences of changing climate all contribute to the likelihood of more frequent and possibly more intense natural, environmental, and technological disasters. Naturally occurring hazards are complimented with socio-natural phenomena associated with processes of environmental degradation and land mismanagement. This applies to conditions within countries,. between neighbours and regions, and internationally

Any sustained commitment to reducing risk must therefore be considered in the context of development processes and human welfare indicators.

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 is currently taking place in the Americas, from a context of traditional disaster management towards major emphasis on integrated risk and vulnerability reduction. The acceptance that disasters, socal and economic development, and environmenta 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.

More attention to community-level requirements and involvement both with a view of enhancing disaster preparedness and risk management are emerging as trend.

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 will conclude at the World Summit on Sustainable Development (WSSD) in Johannesburg, South Africa, to be held in September 2002[1]. The *Rio de Janeiro Platform for Action on the Road to Johannesburg 2002*, adopted by ministers of the environment and other high-level representatives

[1] Visit www.johannesburgsummit2002.org, www.earthsummit2002.org, www.unisdr.org

of the Governments of Latin America and the Caribbean who gathered in Rio de Janeiro in October 2001 to participate in the Regional Preparatory Conference for the WSSD, stresses the need to promote actions towards disaster vulnerability reduction and the promotion of a culture of risk awareness by means of educational processes, improved information dissemination, and early warning systems.

Improved preparedness actions and specialized emergency response services and civil protection, for when disasters do occur, will continue to be needed. However, expenditures for disaster assistance contingencies, or even for maintaining specialized civil defence capabilities, can only be justified if at least similar amounts are *invested* in protecting existing resources and developing lasting capabilities that can increase our resilience to natural hazards. Many countries in the region are looking into institutional changes that reflect the need for integrating response capacity with vulnerability and risk reduction.

Shifting attention and resources to vulnerability and risk reduction is an ongoing job, 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 intersectoral 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 will be 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.

I. 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 bulding preparedness capacoties 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 Foreign Disaster Assistance of the US Agency for International Development (OFDA/USAID), and more recently by the United Nations Development Programme (UNDP), and UNICEF have proven crucial, by providing technical cooperation, training and awareness raising, often built around strategic program areas and institutional strengthening. Other organizations, such as the Organization of American States (OAS), the Network for the Social Study of Disaster Prevention in Latin America (LA RED), many NGOs and several academic initiatives, have encouraged changes in outlook and the development of new understandings 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 Programme (UNEP) and its Caribbean Environment Programme (CEP), the Central American Commission for Environment and Development (CCAD), the International Conservation Union (IUCN), the Inter-American Development Bank (IDB), 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 subregions.

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, for instance in Latin America and the Caribbean. The most comprehensive source is the Regional Disaster Information Centre (CRID)[2], based in Costa Rica, based on an initiative of PAHO since 1990, is supported by many organizations[3] and currently sponsored mainly 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 methodology to

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[2] Visit www.crid.or.cr.

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

promote investment in risk reduction during the recovery phases in Latin America and the Caribbean.[4]

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, bio diversity, wet lands and global climatic change. Essentially, these concerns remit us to the risk and disaster problematic, 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 schemes, implemented on an incremental basis.

II. A snapshot of some recent major disasters in the region

The following is a quick snapshot of some of the major recent and devastating disasters in the Americas.

1. 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, inparticular Cuba, and the losses would have been greater had many people not been evacuated in advance.

2. 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 spawned extensive flooding in some areas, extended drought conditions in others, and widespread wildfires. Of one thing we can be sure: El Niño will return.

3. 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,

[4] Visit http://cepal.org.mx

prompting a rethink of previously accepted procedures for civil and agricultural protection and of the value of structural barriers.

4. 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 on denuded and unstable slopes that were the source of 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.

5. 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 totalling 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, of 7.9 on the Richter scale, was the second most severe in 90 years.

6. 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.

7. Wildfire, 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. .

Additional to the major disasters mentioned above, the losses and social impact of a large amount of small and medium scale events (landslides, flood, fire, etc.) in especially vulnerable areas are generally unrecorded. The accumulated value of these losses is often unrecorded, even though affecting severely people's livelihoods in local communities.

III. Some 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 makes 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 population, 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, when they have not become extinct already.

New studies by the Intergovernmental Panel on Climate Change (IPCC) underscore the likelihood in the 21st Century of greater and more frequent hydrometeorological 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, as well as an intensification of all the phenomena related to El Niño and La Niña.[5] (See Annex 1.) The IPCC expects that in 60 years 25% of all housing within 1.5 Km of beaches might be lost to coastal erosion.

B. Activities, Accomplishments, and Future Trends and Challenges in the Region

I. Andean Countries

1. Activities and Accomplishments

The Andean countries—Bolivia, Colombia, Ecuador, Peru and Venezuela— represents 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 y 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. Even if loss of lives was fortunately low, no higher than 77, the disaster affected over 213,000 people, destroyed or damaged 80,000 housing units, and ravaged 2,000 hectares of crops.

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[5] Janet N. Abramovitz, *Unnatural Disasters*. Worldwatch Paper No. 158, October 2001.

However, it was the singularly violent El Niño phenomenon of 1997-1998 that most heavily stunned 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. It was the severity of this event that motivated the heads of government of these nations to ask the Corporación Andina de Fomento (CAF) to establish, in late 2000, the Regional Programme for Risk Prevention and Reduction (PREANDINO), with the objective of promoting and supporting the development of national and sectoral disaster risk prevention and mitigation policies and of new forms of institutional organization aimed at incorporating 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, facilitate the exchange of information and experience, allow participants to share and shape indicators on the effectiveness of disaster management, and simplify negotiations with financial bodies.

At the national level, Colombia was a pioneer in the region to set up a systematic approach to integrated disaster management, following the eruption and mudslow of Nevado de Ruiz in 1985. The National Disaster Prevention and Response System (SNPAD) has been developed since then. Bolivia has a new legislation that set out an institutional framework for risk prevention. Bolivia is at present 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 incorporating risk reduction into the National Public Investment System.

In the other countries, progress has not been as vigorous, but measures are being taken. 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 making 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 are the design of socio-economic indicators to measure the likely impact of natural hazards on the various regions of each country

in order to contribute to preventive planning, which 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 necessarily calls for 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 college 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 reinforced 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. One is the University of Antioquia in Colombia, whose School of Public Education hosts a PAHO/WHO Collaborating Centre, and which offers a Master's in social sciences and risk management and the University del Valle in Bogota, with an integtared 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 subregion, 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.

Vulneribility studies and re-inforcement programs for health facilities and sanitation systems have been carried out in severa 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 relared 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 leader institutions in national disaster reduction platforms act as focal points for ISDR, in particular to improve information exchange, policy coherence and interaction processes.

2. 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 on the subject 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 programmes. 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, finally raising awareness of the fact that ecosystems are not a cornucopia of inextinguishable resources and human beings cannot stand apart from their physical environment, it is today vital in the Andean countries—but hardly only there—to realize that sustainability can only be achieved by reducing our vulnerability to natural and man-made disasters.

II. Caribbean States

1. Activities and Accomplishments

Caribbean countries share many social and cultural traditions, but they also share something else: the same natural hazards. All countries are vulnerable to hurricanes. Most of the islands are susceptible to earthquakes, and many of them have active volcanoes. Also common are landslides related to intense rain or ground motions. The 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), an increase took place in multidisciplinary discussions on the subject, based on the recognition of the vital need for disaster managers, scientists, engineers, environmentalists, development planners, meteorologists, and legislators should work together to reduce risk. The UNDP, the University of the West Indies (UWI), the Caribbean Disaster Emergency Response Agency (CDERA), and the Office of Foreign Disaster Assistance of the United States Agency for International Development (OFDA/USAID) have all co-hosted biennial conferences on disasters. Many other interdisciplinary meetings have contributed to building 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 IDB, 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. But although most of them have designated a national disaster coordinator, have some facilities for emergency operations, and carry out 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 focussed 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 signature in 2000 of an agreement sponsored by the ACS to improve cooperation in this field 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). OFDA/USAID 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 the human resource limitations in most Ministries of Health, particularly in the smaller islands. By comparison, some countries have institutionalized their health and disaster programme, 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 programmes. 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 IDB is developing several proposals for technical cooperation in the FIELD of climate change. And the World Bank is working through the Organization of Eastern Caribbean States (OECS) in 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, a *Professional Guide to Performance-based Design Upgrade: for Achieving Hurricane-Resistant Construction*, and a *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 on the subject 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 behaviour 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 inform cropping decisions and water storage and distribution planning. Hurricane-tracking and warning systems based on satellite observations and modelling 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.

Embedding disaster management into the sustainable development process is the goal of a CDERA programme 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.

2. 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, which need to establish minimum staffing levels and hire professionals from a variety of disciplines to secure 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.

III. Central America

1. Activities and Accomplishments

Central America is a geographical and geopolitical region with deep lying 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 60s, demise under the stresses of economic crisis and civil war, and 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 a more and more consolidated and integrated economic, social and political unit.

Central American 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. And, 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 intersectoral 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 IDB 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 CEDPREDENAC, 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 '90s, 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, CEDPREDENAC is viewed as a key player by many agencies, particularly given the resurgence of interest in regional endeavours. 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 Co-ordinating 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 organisations such as the Community Network for Risk Management, the Federation of Community Organisations, and the Central American Municipal Federation.

Over the past three years, CEPREDENAC has moved increasingly away from individual project management activities toward the development of broader regional programmes, 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