DEVELOPMENT AND ENVIRONMENTAL CONCERNS

DISASTER REDUCTION WITHIN DEVELOPMENT

Disaster Reduction and Recovery for Sustainable Human Development

Task Manager: United Nations Development Programme (UNDP)
Moderator: Dr. Y. Aysan, Acting Head, Disaster Reduction and Recovery Programme, Emergency Response Division (ERD), UNDP
Rapporteur: Ms. M. O. Gonzalez, Disaster Management Specialist, ERD, UNDP

Speakers:
- Mr. L. de Boice, Deputy Director, Emergency Response Division, UNDP: *"Keynote Presentation: disaster reduction and recovery for sustainable human development"*
- Dr. A. Lavell, Consultant, Hashemite Charity Organization, Jordan, and Secretariat General, Latin American Social Science Faculty (FLACSO), Costa Rica: *"The Impact of Disasters on Development Gains"*
- Mrs. M. Ariyabandu, Programme Manager- Disaster Mitigation, Intermediate Technology Development Group, and Coordinator, Duryog Nivaran, Sri-Lanka, on behalf of Mr. M. Bhatt, Disaster Mitigation Institute (DMI), India: *"Understanding Vulnerability"*
- Dr. J. Pantelic, Urban Redevelopment Specialist, World Bank: *"Sustainable Recovery and Reconstruction"*

Content: This session focused on vulnerability accumulation within development processes and the economic impact of disasters on development gains; the understanding of vulnerability and the challenges for factoring vulnerability analysis into development decisions; and the mainstreaming of disaster reduction considerations into sustainable recovery and reconstruction processes.

During the current decade, the debate on disaster-development relations and the analysis of their practical implications for risk and disaster management finally came of age. The theme has now become an almost obligatory point of reference and reflection when discussing the topic of disasters. One of the results if not one of the causes of the growing concern for the development impact of disasters has been an increase in the number and types of institution involved with the disaster problematic. These are no longer limited to the humanitarian preparedness and response organizations as was essentially the case towards the end of the last decade. Increasingly over the last few years, a number of the major "development" institutions have become more closely involved with the problem.

Conclusions and Recommendations:

- any serious analysis of the disaster-development problem must use a temporal framework that guarantees that the full "life cycle" of a disaster can be closely examined, and not just the short-term period immediately after disaster occurs.
- large-scale events should not typify and dominate the problem of disaster. More concern should be given to the wide range of lower level damaging events that recurrently affect different regions, localities and communities throughout the world.

- the statistics produced to date on disaster impacts are not particularly conducive to any detailed analysis of the disaster-development problem. Other uses and attributes they may well have, but a comprehensive analysis of the disaster-development question is not amongst these.

- concentration on the question of the impacts of disasters on development basically serves as a distraction from the fundamental question, which is the impact of development on disasters. Only by resolving this latter question will we ever get anywhere in terms of risk and disaster mitigation, and, consequently, in terms of reduced disaster impacts.

- the basic problem is not that disasters may have important negative development consequences, particularly where their impact is large relative to the size of the affected economy. Rather, the real problem is the reduced size and/or level of development of the affected economy and society. Instead of satanizing hazards for their impacts on society, it would be probably more correct to satanize society for its impacts on hazards!

- the use of economic criteria and cost-benefit equations for attempting to justify risk mitigation and reduction may reap rewards for the modern sector economy, but this is not the case for the poor and traditional sectors that make up the majority of the victims of disasters. The attainment of securer living conditions for the poor and a substantial reduction in their vulnerability is more a case of ethics, equity and social justice, than economic rationale and efficiency.

LAND USE PLANNING

Task Manager: The IDNDR Spanish National Committee jointly with the IDNDR French National Committee
Moderator: J. San Nicolás Santamaría, Director General, Civil Protection, Spain
Rapporteur: Mr. Ph. Masure, Secretary, IDNDR French National Committee

Speakers:
- Mr. F. Gillet, Pôle Grenoblois d'Etudes et de Recherches pour la Prévention des Risques Naturels, Conférence sur les risques naturels en montagne, France: *"Land Use Planning in Mountain Areas"*
- Mr. P. Douard, Ministère de l'Environnement: *"Disaster Prevention, Land Use Management and Sustainable Development: conclusions from the Paris Conference"*
- Mr. A. Mendes-Victor, Portugal, President, Centro Europeu de Riscos Urbanos (CERU) : *"The Impact of Urban Risk on Environment Safety"*
- Mr. C. Dueñas, Vocal Assessor, Civil Protection of Spain: *"Integrating Risk Analysis into Territorial Policy Planning and Land Use Management"*
- Mr. E.J. Fernández, Under-Secretary, Ministry of Interior of Argentina

Content: This session was based on the outcome of the Paris Conference on Land Use Planning for Disaster Reduction, and analyzed the role of land use management for the reduction of vulnerability and the prevention of natural disasters.

Conclusions and Recommendations:

- Natural disaster prevention needs a global approach taking into account physical and social concerns to conduct an appropriate land management at the national level.
- Prevention has to be integrated particularly into the land management of fragile lands or territories such as big cities, mountain areas, littoral and flood plains as well as degraded natural spaces.
- While there is no universal model given that preventive policies have to be adapted to local conditions (socio-economic, cultural, etc.), hazard mapping, land-use planning and management are basic tools for prevention.
- Prevention needs specific funds. It is proposed to create a special International Fund for Prevention, similar to the World Environmental Facility.
- The implementation of networks at international and regional levels promoting exchanges, common objectives and solidarity could represent a new form of balanced and efficient cooperation.

CAPACITATING DEVELOPING COUNTRIES

Livelihood Sustainability and Risk: Challenges for Developing Countries

Task Manager: South Africa
Moderator: Ms. J. Love. Member of the Parliament, South Africa
Rapporteur: Mr. G. Kilian, Director, Disaster Management, Department of Constitutional Development, South Africa
Speakers:
- Ms. J. Love: Introductory remarks and Presentation on "*Capacity Building in Government (National, Provincial and local Government): Overview and evolution of disaster management policies in South Africa (based on the White Paper on Disaster Management)*"
- Ms. J. Kanyangwa Luma, National Programme Manager, FAO-FHANIS, Zambia: "*Presentation on capacity building by way of outreach programmes*"
- Mr. N. Salazar, Director, Emergency Commission, INAMHI, Ecuador: "*La Leccion de El Nino 97 - 98*"

Content: This session focused on capacity building aspects in Africa as well as in other parts of the world. It emphasized the need for inter-disciplinary coordination that arises at intergovernmental, international and national levels.

Capacity building is an unfolding process (although not an indefinitely, on-going process) of securing the necessary "buy in" of all the relevant stakeholders: scientific, humanitarian and development agencies as well as those who have resources and those who do not. In this respect, ensuring the correct process is vital. The involvement of civil society - in particular private sector capital - is essential. Training and community awareness is also a critical ingredient. Moreover, the existence of NGO capacity (national and international) is crucial although not always understood until such capacity does not exist. As NGOs provide the possibility for flexible and timeous interventions, they should benefit from more support.

Other important aspects of capacity building include adequate resource, interaction with research and technological establishments, access of the press to accurate and timely information, and awareness through education at the earliest age possible.

While the world witnesses time and again the speed at which the natural resource base of a country can be devastated, it cannot afford anymore to have its limited resources destroyed considering that the population needs increase as rapidly as its growth. It should be acknowledged that it is in the interest of all to share resources such as information technology, which do not exist in many parts of the developing world. Information must be networked fully and issues relating to intellectual property cannot become obstacles to the provision of basic necessities for poor and destitute. Targeted subsidization for the poorest of poor is often the only way to reduce their vulnerability. In this respect, managerial capacity building is important.

Conclusions and Recommendations:

- It is important to reflect on the need for capacity building by all and the mutual benefits that would ensue. Projects need to be designed to help every country equally and adequate resources must be found to this end.

- The final declaration of the Programme Forum should emphasize the need to:
  - ensure sustainability of the coping mechanisms of the developing countries through direct investment in facilities (such as information technology and appropriate research) in order to assist in prevention and mitigation;
  - mobilize the private sector to engage in insurance operations (e.g. through the establishment of arrangements into which the private sector can invest).

- There is a need to identify:
  - the appropriate institutional arrangements for disaster reduction which would complement and not duplicate existing arrangements;
  - bases on which any future Programme of Action can be evaluated.

PROTECTION OF NATURAL RESOURCES

Task Manager: International Union for Conservation of Nature (IUCN)
Moderator: Mrs. M. Von Bieberstein Koch-Weser, Director General, IUCN
Rapporteur: Mr. S. Winkler, Special Assistant to the Director, IUCN

Speakers:

- Mr. M. Araujo, former Minister for the Environment in El Salvador, and Mr. O. Arevalo, President of the National Country Confederation in El Salvador: *"Planning for the Next Hurricane: Watershed Management in Latin America"*
- Mr. J Goldammer, Global Fire Monitoring Centre (GFMC), Max Planck Institute for Chemistry, Germany: *"Fire Disasters, Ecosystems and Societies Changing Vulnerabilities"*
- Mr. E. A. Sumardja, IUCN World Commission on Protected Areas, Regional Vice-Chair Southeast Asia: *"Burning Issues: Preventing Forest Fires in Indonesia"*

Content:

Within an overall consideration of disaster reduction, the session focussed on maintaining and rehabilitating resilient environmental and social systems which form key building blocks for disaster preparedness and security

The impacts of floods and hurricanes have become more devastating with time, as they harm densely populated areas, agriculture, and urban and road infrastructure. In many places on earth we have seen repetitions of the cycle of physical reconstruction and nature's wrath in regular intervals. This has led to work on the fundamentals of greater resistance to natural hazards. Most investments into greater resistance have focused so far on engineering solutions concentrating on large infrastructural works better building standards, and the construction of shelters. However, these efforts are insufficient, as long as the reconstruction interventions are not better linked to the development and implementation of disaster preparedness strategies that include resilient infrastructure and resilient environmental and social systems.

Hurricane Mitch has been so devastating in Central America in 1998 because many of the natural systems, which used to buffer against devastation, have been drastically altered by human deeds over the years. However, viable alternatives to patterns of destruction of these systems are demonstrated by the very few Honduran watersheds where reforestation and soil conservation had indeed taken place as part of development assistance programs. In some of these better protected areas, there where no deaths at all among the affected population. As long as emergency assistance programs are not focusing on medium and long-term disaster preparedness it is to fear that devastation will perpetuate when the Hurricane Mitchs of the future recur, or when El Niño strikes once again. True attention has to be given to investments in environmental reconstruction of upper watersheds, wetlands and mangroves to avoid a detrimental cumulative effect, as finite environmental resources are swept away forever - precious soil and ecological resources.

The fire and smoke episode of 1997-98 in South East and North Asia, the Americas and the Mediterranean helped focus world attention on what is an increasing problem. The application of fire in land-use systems and forest conversion was associated with the extreme drought caused by the El Nino-

Southern Oscillation (ENSO) event which created conditions for the escape and spread of often uncontrollable wildfires. In this respect, a series of studies have documented damages and losses caused by fire and smoke pollution. Weather conditions exacerbated by an unusually strong El Nino (perhaps itself enhanced by climate change) are part of the reason why the fires got so out of hand during the most recent episode of 1997-98. But the scale of the fires has more to do with human factors than with any natural causes. While some fires were set to cover up illegal logging, most of them were intended to convert forest to other land uses. The responsible stakeholders are not just small farmers. The activities of plantation and timber companies, misguided government settlement schemes and subsidy policies that encourage forest clearance and burning are responsible for much of the damage. Due to the lack of a proper base of knowledge and monitoring, it is unfortunately often not easy to distinguish well-balanced natural fires or the traditional and beneficial use of fire in maintaining land-use systems from those fires which have destructive effects on societies and the environment.

Conclusions and Recommendations:

- There is a need to develop a coherent disaster preparedness strategy on a country-by-country basis, linked to regional preparedness strategies based on river basin linkages. To this end, governments have to treat disasters as normal events, which deserve consideration in mainstream, long term planning. Also, basic structural improvements have to be put in place in order to make physical infrastructure, natural systems and water management as well as human communities more resilient.

- In many regions of the world the scale of destructive fire events is quite clearly beyond the capacity of many individual nations to cope. Political leaders, industrialists, ecologists and other people now need to work together to seek realistic and workable solutions. Policies at national and international levels need to be reformed and implemented to provide an improved legislative, economic and technical basis for controlling harmful anthropogenic fires. An internationally concerted action programme is required to facilitate access to and monitor fire-related information, to bridge the gaps between the wealth of scientific knowledge and the yet existing weaknesses in fire management and policy development.

VULNERABILITY OF ECOSYSTEMS AND NATURAL DISASTERS

Task Manager: Department of Economic and Social Affairs (DESA), United Nations
Moderator: Mr. M. Dengo, Chief, Water Management and Small Island Developing States (SIDS), DESA
Rapporteur: Mr. A. Dahl, Coordinator for Earthwatch, United Nations Environment Programme (UNEP), Geneva

Speakers:
- Mr. M. Dengo: "*Mountains and Small Island Environments*"
- Mr. J. Rynn, Director, Centre for Earthquake Research in Australia: "*The Protection of* SIDS"
- Mr. J. Liévois, Geologist, Office National des Forêts, France . "*The Protection of the Mountainous Ecosystem*"
- Mr. S. Kulmakhanov, Chairman, Emergency Agency of the Republic of Kazakhstan: "*Natural Disaster Prevention: Mountain Ecosystems in the Republic of Kazakhstan - a Decade of Achievements*"

Content: The session focused on two geographic situations and ecosystems where vulnerability to natural disasters is particularly concentrated: mountains and small islands. Specific case studies addressed the use of forests to control rockfalls and avalanches in the Alps, reduction of mud flows and earthquake hazard mapping in Kazakhstan, and regional organization for disaster reduction in the South Pacific.

Good progress is being made in the identification and mapping of risks, including source and target areas, using GIS and modeling approaches. Research and field experiments are increasing the understanding of phenomena causing disasters as well as risk reduction methods.

Responses to the identified risks include ecosystem management for protection, as in forest management to reduce rockfall and avalanche, and engineering works to lower lake levels or trap mudflows before they reach urban areas. The institutional and human dimension of disaster reduction and response in vulnerable areas is not to be neglected, as well as empowering society to respond more effectively.

For small island developing states, regional collaboration is particularly important, since their capacity to respond to disaster impacts is limited.

Conclusions and Recommendations:

- At national level, institutional arrangements, legislation/regulations and financing mechanisms need to be mutually reinforcing to cope with ecosystem management for natural disaster protection in vulnerable areas.

- In the field, a network of local practitioners is necessary to implement solutions and to bridge the communication gap between politicians, researchers/technicians and the public. This can build both a culture of risk awareness and a consensus on the response

CLIMATE CHANGE AND NATURAL HAZARDS
Experience in and from Switzerland

Task Manager: Switzerland
Moderator: Mr. A. Götz, Deputy Director, Federal Office for Water Management, Chair, National Platform for Natural Disaster, Switzerland (PLANAT)
Rapporteur: Mr. O. Lateltin, Executive Secretary, PLANAT

Speakers:
- Mr. A. Götz: Welcome and introduction, "*Efforts made in Switzerland during the* IDNDR", "*Guidelines and Strategies for Natural Hazards Assessment*"
- Prof. H. Wanner, Head of the Climatology and Meteorology Research Group, University of Bern, Switzerland, : "*Climate Change and Variability*"
- Dr. M. Zimmermann, Director, Geo7, Bern, Switzerland : "*Natural Disasters and Response*"
- Dr. B. Martinelli, Observatorio Vulcanologico, Pasto, Colombia: "*International Cooperation and Transfer of Knowledge*"
- Mrs. Ch. Langenberger, Member of National Council, Government of Switzerland: "*Messages from Switzerland*"

Dialogue Moderator: Mr. F. Gillet, Pôle Grenoblois d'Etudes et de Recherches pour la Prévention des Risques Naturels, Conférence sur les risques naturels en montagne, France

Content: The session discussed various aspects of climate change and natural hazards in Switzerland with emphasis on mountainous regions. Problems related to risk management in Switzerland and other regions of the world were also appraoched.

The earth's climate has a natural variability. Nowadays, it is however admitted that human activity has also a measurable effect on this variability, although the full proof of human impact on the warming of the atmosphere will hardly be achieved in the near future. Nevertheless, there should be no delay in implementing climate protection measures to prevent further extent of damage such as an increase in global warming due to emission of greenhouse gases. The effects of global climate change differ from region to region. In order to achieve an efficient reduction of these effects, there is a need for a "strategy of distinct measures" which would also benefit other fields (e.g. energy, traffic etc.).

Population in mountainous areas is particularly prone to global changes and their respective effects. Although changes of natural environment often occur slowly and are not always easy to recognize, studies conducted in various countries clearly demonstrated that in mountainous areas the effects of such changes (e.g. melting of permafrost) may occur suddenly and dramatically. Also, changing natural and socio-economic conditions challenge behavioral patterns based on long-standing experience to cope with nature and protection against hazards. That is why prevention of natural hazards requires an in-depth analysis of changing environment and the full cooperation of the affected population. Future land use practice should take into account the increasing vulnerability of the society with regard to natural hazards.

The large variety of natural hazards, the intense use of areas at risk and the high dependence on technical systems call for a re-evaluation of the natural hazard policy which should also include climate change aspects and reflect the need to move from protection against hazards to management of risks. Reduction of natural disasters requires the creation of a global concept for prevention encompassing natural hazards, socio-economic conditions and cultural values. Although the existing land-use planning defines the necessary safety objectives, a 100% safety with regard to natural disasters cannot be achieved. It is therefore important in the long term to discuss openly what level of risk would be considered acceptable for a given society. Switzerland is preparing its move from the fight against nature to a distinct management of risks ("risk culture") that will estimate changing hazard conditions and changing demands versus available capacities of the society to respond to these changes.

It is admitted that international collaboration in the exchange of scientific know-how and practical experience in the field of natural disaster reduction favors the accumulation of the necessary knowledge for the development and implementation of prevention strategies . Transfer of know-how should therefore be achieved through partnership based on a multilateral information network reflecting cultural differences with regard to natural hazards and their impacts. For it is important to foster through dialogue the understanding of differing behavior towards natural hazards and differing value systems on human life and property.

Conclusions and Recommendations:

- There is a need to move from protection against hazards to the management of risks;
- In Switzerland it has been proven that changes of economic and socio-cultural conditions are responsible for the increase of natural disasters, which in turn could be intensified by climate change. As a political answer to these changing conditions Switzerland is proceeding to the development of a "risk culture";
- Transfer of scientific know-how through partnerships is crucial for the development of prevention strategies;
- Global climate change entails local consequences. An effective climate policy requires the inclusion of the concept of prevention;
- In alpine countries, priority should be given to the reduction of vulnerability to natural hazards. In this respect, each individual can contribute to the building of a safer environment;
- Population growth, uncontrolled land use and negligence of the people in relation to nature increase the vulnerability of the society with regard to natural hazards;
- A 100 percent safety in terms of protection from natural disasters does not exist. Therefore, the level of acceptable risks as to be defined for each society;
- The existing scientific know-how and experience in the field of natural hazards should be shared at all levels (global, regional, local) in order to benefit all parts of the world.

SUCCESS STORIES

Task Manager:
Australian IDNDR Coordination Committee

The purpose of these sessions was to focus on particular successful initiatives arising from the IDNDR

1. **Moderator:** Mr. A. Hodges, Director-General, Emergency Management, Australia
   Rapporteur: Mr. A. Hodges
   Content: **AUSTRALIA:** "*Partnerships and Education through* IDNDR"
   Speakers: Ms. P. Marks, Manager, Australian IDNDR Program
   JAPAN: "*Establishment of the Asian Disaster Reduction Center* (ADRC) - *Disaster Reduction Cooperation through Information Sharing*"
   Speaker:
   - Dr. Y. Ogawa, Deputy Director, ADRC
   - Mr. M. Murata, Senior Researcher, ADRC

The Australian IDNDR Committee gained considerable leverage in achieving IDNDR objectives by funding a relatively large number of projects at modest levels in partnership with other organizations and individuals. This was undertaken at international, national, state and local community levels. The result proved that with a modest outlay of funds a great deal can be achieved. A particular example is the way disaster reduction education has been widely implemented in classrooms at both primary and secondary school levels through assisting teachers and teacher associations in the preparation of curricula materials relevant to disaster reduction.

The establishment of the Asian Disaster Reduction Centre (ADRC) represents an international co-operative effort in which 26 countries have been involved. ADRC's objective is to accumulate and disseminate information on disasters and their reduction in the Asian region. A key aspect of the ADRC is the development of extensive databases which are Internet accessible. When fully implemented later this year the ADRC will provide a major base for extending the work of the IDNDR programme in the Asian region into the 21st Century.

It was noted in both presentations that the umbrella of IDNDR has provided an important focus for, and stimulus of, national and international activities concerned with disaster reduction.

Conclusions and Recommendations:

Should be recognized:

- the value of developing partnerships at all levels - from the broad international level to community based groups - to promote, develop and implement disaster reduction initiatives.

- the value of using the latest information technology such as electronic databases to store information, and the Internet to distribute information, as the basis for international cooperation in achieving disaster reduction.

2. Moderator: Mr. B. Lancaster,
Director of the South Australia State Emergency Service, Australia
Rapporteur: Mr. A. Hodges, Director-General, Emergency Management, Australia
Content: **BANGLADESH:** *"Cyclone Preparedness in Bangladesh"*
Speaker: Lt. Col. M. Haris, Director General, Disaster Management Unit
GERMANY: *"Living with Floods"*
Video presentation
German National Committee for IDNDR

In **Bangladesh**, remarkable changes have been achieved in the awareness and self-sufficiency of coastal dwellers in cyclone-prone areas through the training and mobilization of nearly 33, 000 volunteers to provide a wide range of services including: public awareness and preparedness programmes before the cyclone season, relocation of threatened communities in approved shelters, dissemination of cyclone warnings at local level, rescue of victims, post-cyclone relief and coordination of post-event activities.

The Video presentation by the German National Committee proved that communities can tackle the problems of flooding through citizen's action groups provided with an adequate training. Their role is crucial in both prevention and response to floods.

Both presentations highlighted the benefits that flow from the involvement and empowerment of threatened, or potentially threatened, communities

Conclusions and Recommendations:

- Empowering local communities to address local problems
- Supporting emergency management activities through the use of trained, committed and resourced volunteers

3. **Moderator:** Mr. D. Smith, Visiting Fellow, Centre for Resource and Environmental Studies, ANU
Rapporteur: Mr. J. Paul, Director, Tasmania State Emergency Service, Australia
Content: **ZIMBABWE:** *"Public Awareness: Use of Forecasting as a Basis of Public Awareness"*
Speaker: Ms. S. Ndlovu, Deputy Director, Department of Civil Protection
CUBA: *"Achievements of the IDNDR National Committee of Cuba"*
Speaker: Mr. A. Castellanos Perez, Chief, Development Division, Civil Protection of Cuba

To minimize the risks associated with the extreme climatic events as a result of the El Nino phenomenon, **Zimbabwe** introduced a public education program which comprises seminars and media programs in English and local languages. The campaigns have been very successful in raising public awareness on the need for intersectoral collaboration to cope with risks. Due to the success of this program, a campaign is now planned for the cold dry season.

Cuba has implemented a national program including the Meteoro program involving some 4 million people and which provides an annual focus on community awareness at the onset of each hurricane season Thank to this programme, 800 000 people together with their cattle and other animals have been evacuated on time during Hurricane George in 1998 which, as a result, claimed only six lives. Another major contribution has been the provision of medical expertise in disaster stricken areas and medical training in Havana. Although Cuba has limited economic resources, it has assisted other nations in Central America and the Caribbean during Hurricane Mitch and other disasters.

Conclusions and Recommendations:

- Designing community education programs to suit targeted communities.
- Involving all government agencies (sectors) in the development of programs.
- Recognizing the importance of mutual international cooperation between smaller nations.
- Conducting an annual pre-disaster season public education program.

4. **Moderator:** Ms. T. Casinader, National Program Manager, Bureau of Meteorology, Australia
Rapporteur: Mr. D. Smith, Visiting Fellow, Centre for Resource and Environmental Studies, ANU
Content: **CANADA:** *"The Establishment of the Institute for Catastrophic Loss Reduction - A Partnership between the Insurance Industry and Academe"*
Speaker: Prof. A. Davenport, Chairman of the Canadian IDNDR Coordination Committee
MOROCCO: *"Case Study from Morocco"*
Speaker: Prof. A. El Mouraouah, National Research Centre, Morocco

The establishment of the Institute for Catastrophic Loss Reduction amounts to some C$7.5M over five years. This partnership comprises the Insurance Bureau of Canada and the University of Western Ontario and has been agreed upon in April 1999. Two Research Professorships in the field of engineering and social science will be established at the University of Western Ontario and provide seed money for research in Canada and elsewhere will be provided. The Insurance Bureau of Canada will also formulate a National Mitigation Strategy. This exemplify cooperation in the form of a substantial financial investment shared by governments, the insurance industry and academe.

Morocco faces severe earthquakes such as the Agadir earthquake in 1960 which claimed 12,000 lives. Preventive activities undertaken by the country include a seismic monitoring network established in the 1990s and comprising today 70 state-of-the-art stations linked by telemetry to a seismic laboratory funded in part by the Arab Fund for Economical and Social Development, a UNESCO agency. These stations monitor and transmit data to a central location in Rabat, from which alerts can be issued to local and regional governments in the event of an earthquake. Detailed seismic measurements are also made for 92 large dams. Analyses are currently being undertaken to enable more effective risk management in case the building of a potential tunnel between Africa and Europe under the Straits of Gibraltar went into realization. This initiative illustrates a successful international cooperation for the monitoring, analysis and research in the field of seismic hazards.

Conclusions and Recommendations:
Enhance cooperation between nations, disciplines and sectors

5. **Moderator:** Dr J. Rynn, Director, Centre for Earthquake Research in Australia
Rapporteur: Mr. B. Lancaster, Director, South Australia State Emergency Service, Australia
Content: **SOUTH PACIFIC AREA:** *"IDNDR and the South Pacific Disaster Reduction Programme"*
Speaker: Mr. A Kaloumaira
ARMENIA: *"the Armenian National Survey for Seismic Protection"*
Speaker: Prof. Dr S. Balassanian, National Survey for Seismic Protection
MALI: *"Case Study Management of Disaster by the Local Community"*
Speaker: Mr. G. Konate, Responsible for Regulations, Ministry of Natural Resources, Mali

Island countries from the South Pacific Area are particularly vulnerable to natural hazards. During the Decade. they experienced tropical cyclones. earthquake. volcanic eruption, tsunami, flood and drought These events have had short-term and long-term devastating impact. The IDNDR has provided the incentive to implement a disaster reduction program in the area. The programme developed a common strategy to all Pacific Island countries in a pro-active rather than a reactive approach which included Regional Disaster Management meetings, specific projects (25 in number), and in-country World Disaster Reduction Day activities. It ensued an increasing self-reliance thank to the use of own resources and the adoption of the IDNDR principles of mitigation. The resilience of the societies and the reduction of vulnerability has been achieved across the region, not just by response alone, but also by implementation of effective measures with regard to early warning, prevention, preparedness and mitigation procedures.

Subsequent to the Armenian earthquake of 1988 and an assessment of various types of hazard concluding that 94% of state loss is connected with strong earthquakes, **the Armenian National Survey for Seismic Protection (NSSP)** was established in 1991 under the authority of the Government of the Republic of Armenia. The distinctiveness of the NSSP includes high governmental status, high responsibility in terms of seismic risk reduction and a unique structure. The NSSP implemented a seismic risk reduction strategy which is a comprehensive long-term state program for seismic risk mitigation including the development of new technologies to reinforce existing buildings. The NSSP experience has shown the possibility to implement advanced system for the protection of the population from large-scale disaster events in countries experiencing economical difficulties.

In 1998, very heavy rain hit a local area in **Mali** whereby one third of the houses were flooded, causing the displacement of over 300 persons. An effective assistance to the victims involving the local population solidarity was organized through the dissemination of information by six private radio-stations transmitting in the national languages to an audience mostly illiterate.

Conclusions and Recommendations:
- insisting on the information and education of all potential actors involved in the management of natural disasters
- enhancing partnership with civil society
- empowering local communities

OPEN PUBLIC FORUM
Task Manager: IDNDR Secretariat

COMMUNITY BASED DISASTER REDUCTION

Moderator: Mrs. Z. Delica, President, Global Forum of NGOs for Disaster Reduction (GFNDR) and Manager, International Consultancies Management, Asian Disaster Preparedness Centre (ADPC)

Rapporteur: Prof. I. Nyambok, University of Nairobi and Member of the United Nations Scientific and Technical Committee (STC) on Natural Disaster Reduction

Speakers:
- Mr. Ch. Eikenberg, German National Committee for the IDNDR: *"Strengthening Local Disaster Preparedness Structures"*
- Mr. N.K Jain, Secretary-General, GFNDR: *"Role of NGOs in Disaster Reduction"*
- Ms. A. Galperin, Senior Officer, Disaster Preparedness Department, International Federation of Red Cross and Red Crescent Societies (IFRC): *"Community based Disaster Preparedness Programmes in the International Federation of Red Cross and Red Crescent Societies"*

Content:

"Strengthening Local Disaster Preparedness Structures": Mr. Eikenberg reported on two co-operation projects between local authorities in civil protection involving Morocco and Germany on the one hand, and Uzbekistan/Kyrghyzstan and Germany/Netherlands on the other. Each project will last for two years and involves twinning towns from participating countries. In order to increase efficiency of delivery services, it has been decided to decentralize these projects, which require a long-term evolution of political structures. The scope of the projects includes identifying the participating twin-towns and setting out the objectives as well as activities such as training seminars and production of films. For the projects to succeed they must be linked to identified on-going projects and supported by strong partnership and transfer of technology. Funding is being shared among the participating countries with a contribution of the European Community Humanitarian Office (ECHO) for the second project.

"Role of NGO's in Disaster Reduction": Mr. N.K. Jain stressed the need to give due recognition to NGO's role in disaster reduction by giving examples of NGO's success stories in Asia and Latin America. While communities are often included in disaster reduction planning, he noted that the role of NGOs is at times marginalized as in the case of disaster management training where high costs limit NGO participation. The Global Forum of NGOs for Disaster Reduction (GFNDR) was created after the Yokohama Conference and gathers NGOs from different orientations and origins with varied interests.

"Community - based Disaster Preparedness Programmes in the International Federation of Red Cross and Red Crescent Societies (IFRC)": Ms. Galperin summarized the main objectives of these IFRC programmes as preparedness to response to cope better with the impact of disasters; prediction and prevention where possible; and disaster mitigation. Implementation of these programmes includes disaster awareness and public education as well as community organization and community microprojects. When planning interventions, prioritization is made on the basis of hazard, geographical location, vulnerable groups and nature of activities; co-operation with governments, NGO's and the private sector; and integration of preparedness into problems of everyday nature.

Conclusions and Recommendations:

- Local communities should be empowered to plan and initiate their own development programmes, including mitigation of disasters with, for instance, devolution of power to rural committees through legislation.
- The IDNDR Secretariat or the successor organization should broaden its contacts and activities to deal not only with governments and specialists, but all stakeholders at all levels.
- Co-operation between NGO's and governments is necessary and should be encouraged to enhance the value of data and information exchange.
- Community Representatives should be consulted at all times in disaster planning as their participation in decision making is imperative to enable successful community based disaster reduction

NETWORKS AND PARTNERSHIPS

Moderator: Mrs. L. Benazza, Deputy Director, Ministry of Scientific and Technical International Affairs, Algeria, and President, Algerian National Committee for the IDNDR

Rapporteur: Prof. I. Nyambok, University of Nairobi and Member of the United Nations Scientific and Technical Committee (STC) on Natural Disaster Reduction

Speakers:

- Prof. I. Davis, Chairman, Applications and Implementation Working Group, UK National Coordination Committee for the IDNDR: "Audit of the UK Activity"
- Mr. E. Picado, the Central American Community Network for Risk Management, Nicaragua: "*For a Safer and more Dignified Community with the Participation of Everyone*"
- Mr. F. Parsizadeh, Director of Public Education Department, International Institute of Earthquake Engineering and Seismology (IIEES): "*Earthquake Public Education in Iran*"

Content:

"Audit of the UK Activity": Prof. Davis explained that the purpose of the U.K. audit is to review the effectiveness of the UK efforts during the IDNDR. The report focuses on the developing countries rather than Britain and involved quantitative and qualitative appraisals of the effectiveness and performance of policies, projects and activities. The overall outcome of the audit was quite positive in concluding that the IDNDR is an important initiative and should continue into the next millennium. While recognizing the major achievements of the IDNDR including building multi and interdisciplinary networks at both local and international levels, developing integrated research, enabling organization of conferences and publication of books and promoting the role of the private sector in risk reduction, the audit points out weaknesses in communication to capture the interest of the public (due in part to an acronym title which has not been easily recognizable), and to inspire the attention and concern of the media, industry, commerce and to some extent the Governments.

"For a safer and more dignified community with the participation of Everyone": Mr. Picado explained that his organization, LaRed (based in Nicaragua) involves several Latin America countries, in particular national institutions, centers and NGOs. It focuses its activities on alleviating extreme poverty. To this end, the participation of local communities in disaster reduction is basic and relevant authorities should promote community networks and empower communities so that the latter can contribute to their own safety through proactive, sensible and up-to-date disaster reduction measures. Central America efforts in this field have been instrumental in developing policies, influencing decision making process, promoting strategic planning and defining appropriate land use policies. However communities could be even more involved in this process, especially those most vulnerable to natural and man-induced hazards. To this end, it is crucial that communities receive relevant education and training as it is an important aspect of disaster reduction efforts. Hurricanes, like Mitch, have made communities more aware of their vulnerability and highlighted the limitations in the assistance national governments can provide thus reflecting the increased need for communities

to work with one another. Prevention and raising awareness of disasters are vital and communities could benefit mutually from their experiences and success stories.

"Earthquake Public Education in Iran"· Mr. Parsizadeh pointed out that Iran has been known as one of the most active earthquake countries. That is why Iran has emphasized public education as a tool to increase awareness on seismic activities and their related hazards. The education programme which mainly targets children and adolescents is geared towards sensitizing the public on the necessary precautions to be taken in order to ensure safety of their homes, families and community. Additionally, in order to be suitable for various community groups, the programme takes into consideration the role of gender, age, education level, and socio-cultural background of the targeted community. Lastly, the media plays an important role in the programme.

Conclusions and Recommendations:

- alleviating poverty is of paramount importance for the reduction of natural disasters and should be given concerted efforts globally
- structured education programme for various groups in society should involve all levels of society
- partnerships should be enhanced to improve sharing of knowledge, exchange of experiences and international cooperation

EARLY WARNING

Moderator: Prof. J. Zschau, Director, Division of Solid Earth Physics and Disaster Research, GeoForschungs Zentrum (GFZ), Potsdam, Germany

Rapporteur: Prof. I. Nyambok, University of Nairobi and Member of the United Nations Scientific and Technical Committee (STC) on Natural Disaster Reduction

Speakers:

- Dr. I. Obrusnik, Chairman, Czech Republic IDNDR National Committee. *"Integration of Warning and Forecasting Services"*
- Mr. F. Helloco, Engineer, Météo France: *"Early Warning for Flash Floods in France recent advances"*
- Prof. Shi Pei-jun, Chinese National Committee for IDNDR (CNCIDNDR). *"98' Flood Disaster in China"*

Content:

"Integration of Warning and Forecasting Services": Dr. Obrusnik gave a description of the practical applications of early warning in the Czech Republic. Integrated services have been used to convey information regarding impending hydrometeorological events and hazards. Precipitation-runoff models have become increasingly important. A structured flow chart showing how flood forecasting is practiced in the Czech Republic was presented.

"Early Warning for Flash Floods in France: recent advances". Mr. Helloco presented the scope of Météo France's operations, incorporating 53 different announcing departments. Most of France's territory is covered with a radar network which is used to provide hydrological models and comparative analyses with other data-sets. Real-time experiments associating radar-rainfall with runoff models have provided encouraging results in the prediction of flash floods. However, further verification and validation of these results are still necessary to test the sensitivity of the experiments and to improve the alert procedures in the early warning programme.

"98' Flood Disaster in China": Prof. Shi Pei-jun presented statistics on past and present precipitation levels and on fatalities and economics loss related to Yangze River floods. Co-ordinated efforts were made to bring the floods under control and to initiate a process of recovery and rehabilitation, using units of the Chinese military establishment and civil society to evacuate and relocate affected people, provide food, cloth and medical services, and to organize and mobilize relief donations. This experience brought into focus the need for a sound co-ordination mechanism, an enhanced role of local governments and the empowerment of local communities regarding natural disaster related to floods.

Conclusions and Recommendations:

- using early warning as a means of empowering communities threatened by impending disasters
- warning has to be given in good time, be precise and prompt, and should convey reliable information
- education, telecommunication systems, multi-disciplinary approaches and networking with other organizations must be strengthened locally and regionally in order to enhance early warning efforts

INTEGRATED RISK MANAGEMENT

Moderator: Mr. G. Deneufbourg, Secretary General, French National Committee for the IDNDR

Rapporteur: Prof. I. Nyambok, University of Nairobi and Member of the United Nations Scientific and Technical Committee (STC) on Natural Disaster Reduction

Speakers:
- Mr. B. Koffi, Government of Côte d'Ivoire: *"The Protection of Natural Resources in the Côte d'Ivoire"*
- Dr. A. Mikayelyan, Chief Specialist, Northern Department of the National Survey for Seismic Protection of Armenia: *"Teaching Seismic Protection Skills at Schools of Armenia"*
- Mr. P. Patabendi, Team Leader, Team for Disaster Prevention and Sustainable Development (Team DPSD), Sri Lanka: *"Extreme Weather Events due to Climatic Changes"*

Content:

"The Protection of Natural Resources in the Côte d'Ivoire": Mr. Koffi described the geo-ecological setting of Côte d'Ivoire and its varied physiography. Between 1955 and 1993, forests have been disappearing due mostly to bushfires aggravated by environmental degradation. The Côte d'Ivoire is therefore under pressure to find sustained ways of protecting its natural resources against disasters

"Teaching Seismic Protection Skills at Schools of Armenia": Dr. Mikayelyan explained that in Armenia, teaching of seismic protection is an essential aspect in the reduction of social and economic disruptions caused by earthquakes. Analysis of the 1988 Spitak earthquake revealed lack of adequate protection procedures especially for children. The Northern Department of the National Survey for Protection with financial support from UNICEF started a training programme designed for children and schools to be incorporated in school curricula. This initiative is a major step towards implementing a national programme for the prevention of potential damages through seismic events in Armenia

"Extreme Weather Events due to Climatic Changes": Mr. Patabendi explained that floods are the number one disaster in Sri Lanka. Climatic changes are mainly influenced by depressions in the Bay of Bengal and inter-monsoon rains and are often associated with typhoons and cyclones producing floods near the coasts leading to landslides.

Conclusions and Recommendations:
- vulnerability, and in particular poverty, should be considered as a key factor in assessing environmental risks, especially in marginal areas
- integrated applications of science and technology should be part of preventive measures
- education is a prerequisite to building a culture of prevention

ACTION TOWARDS THE 21ST CENTURY

REGIONAL APPROACHES TO DISASTER REDUCTION: NETWORKING, SYNERGIES AND COORDINATION

Task Manager: IDNDR Secretariat
Moderator: Mr. J.-P. Massué, Executive Secretary of the EUR-OPA Major Hazards Agreements, Council of Europe
Rapporteur: Ms. H. Molin-Valdes, Head of the IDNDR Office in Costa Rica

Speakers:

- Ms. A. Fischel, Vice President of the Republic of Costa Rica: *"Regional dimensions of disaster reduction in Latin America and the Caribbean"* (The San Jose Declaration, June 1999)
- Dr. I. Obrusnik, Czech Hydrometeorological Institute: *"Cooperation for the Prevention of Disasters in the Central European Region"* (the Prague Declaration on Disaster Reduction, June 1998)
- H.E. K. Garnjana-Goonchorn, Ambassador Extraordinary and Plenipotentiary, Permanent Mission of Thailand to the United Nations: *"The Economic and Social Aspects of Disaster Reduction in Asia"* (Bangkok Declaration in Disaster Reduction, February 1999)
- Mr. S. Balassanian, President, Nation Survey for Seismic Protection of Armenia: *"Future problems of disaster reduction in the CIS region"* (Yerevan Declaration on IDNDR in the CIS Countries, September 1998)
- Mr. San Nicolás Santamaría, Director General, Civil Protection, Spain: *"Common problems and future needs in the Mediterranean Region"* (Valencia Declaration on Disaster Reduction, May 1999)
- Mr. W. Hooke, Chair, Subcommittee for Natural Disaster Reduction, Washington D.C., USA: *"The United States approach to Disaster Reduction"*

Content:

The session reviewed ten years of achievements in disaster reduction at the regional level, based on the official declarations adopted at the IDNDR Regional Meetings organized within the framework of the closing events of the Decade. It also formulated priority recommendations for future actions and provided specific examples of successful strategies for education and national disaster mitigation policy programmes for disaster reduction.

During this decade several major natural hazards have transformed into major disasters costing billions of dollars in economic losses and enormous psycho-social distress. While improved early warning mechanisms and organization for effective evacuation and response saved hundred thousands of lives, poverty, accelerated urbanization (mega-cities), environmental degradation and lack of development remain the main causes of natural disasters. When reducing vulnerability and risks associated to future disasters, should be taken into account the important consequences of disasters including air and water pollution, mass movement of people, migration and technological disasters. It should be noted that reconstruction processes represent a good opportunity for implementing the necessary disaster reduction measures and policies. The IDNDR impetuous as a stimulus for partnerships and improvement in public awareness and political sensitiveness proved very useful in this respect. Regarding future arrangements for the successor of the IDNDR, the Government of Costa Rica urged the United Nations to maintain the regional Unit for Disaster Reduction for Latin America and the Carribean as a platform for information exchange, public awareness and coordination and offered to continue hosting this entity.

Conclusions and Recommendations:

While each region and each country has specific characteristics and needs, they do share common concerns on major issues which were identified as priorities for future actions. These were:

- Public awareness and sensitizing, involving mass media, to influence behavior towards a culture of disaster prevention.
- Dissemination of existing and future information using new technologies to enhance disaster reduction
- Capacity building as a general priority and more specifically education at all levels including primary and secondary school curricula, university degrees, adult training, formal and non-formal education of groups with special needs.
- Strengthening and coordination of regional and international cooperation for disaster reduction within sustainable development as well as environmental and humanitarian assistance agendas.
- Improvement of national institutional and legal frameworks for disaster prevention policies by enhancing national capacities, human resources and equipment, especially for developing countries.
- Community empowerment and involvement, not only for response to disasters, but also for policy development towards risk reduction
- Support for the use of new technologies and information tools for disaster reduction.
- Importance of the specific role of the private sector and insurance for disaster reduction.
- Inclusion of technological disasters in disaster reduction national and international mandates.
- Establishment of regional centers or structures to act as advocacy and public awareness platforms for disaster reduction promoting annual or regular regional meetings and training.
- Sustained improvement of early warning systems and mechanisms.
- Need for a follow-up mechanism to IDNDR of a multi-disciplinary and inter-agency character within the UN system to continue the promotion of disaster reduction on a cross sectoral basis.

CLIMATIC VARIABILITIES AND EXTREMES: EL NINO, LA NINA

Task Manager: United Nations Environment Program (UNEP) Nairobi, Kenya
Moderator: Mr. A. Alusa, UNEP Atmosphere Programme
Rapporteur: Mr. S. R. Jegillos, Director for Asia, Asia-Pacific Disaster Management Centre, Makati City, Philippines

Speakers:

- Mr. A. Alusa: Presentation of the UNFIP Funded Project on "*Reducing Environmental Emergencies Through Early-Warning and Preparedness: the Case of the El Niño Southern Oscillations* (ENSO)"
- Mr. B. Kinninmonth, WMO Consultant: "*Detection, Monitoring and Forecasting of El Niño, La Niña events: the 1997/1998 Scientific and Technical Retrospective*"
- Mr. M. Glantz, Environmental and Societal Impacts Group, National Centre for Atmospheric Research, Boulder, Colorado: "*El Niño, la Niña socio economic impacts and approaches towards the reduction of their adverse effects on societies in the twenty-first century*"
- Mr. F. Paliz, Director General, Division of External Affairs, Foreign Ministry, Quito, Ecuador: "*The UN Inter-Agency Task Force achievements on El Niño*"

Content:

The 1997/98 El Niño event, followed by a La Niña phase, was amongst the strongest in recorded history. It has, thus, created a high level of awareness, in all domains, about such climatic variabilities and extremes and their relation to natural disasters, environment and sustainable development. This session reviewed the current state of understanding of climate variabilities and extremes with regard to El Niño and la Niña.

"Reducing environmental emergencies through early warning and preparedness: the case of El Nino Southern Oscillation" is a project involving 15 countries and implemented jointly by UNEP, the United Nations Foundation, WMO, NCAR, the United Nations University and IDNDR. The main purpose of this project is to enhance the understanding of issues at stake by:

- reviewing the current situation with regard to global, regional and national predictions as well as early warning and preparedness systems and assessing how these maybe improved.
- assessing the vulnerability of socio-economic sectors and the information needs for decision-makers in these sectors.

The review and assessment will be carried out through studies at global, regional and national levels.

The scientific and technical retrospective of the 1997-1998 El Nino event conducted by WMO consists of a description of activities pertaining to global assessment, monitoring, and consolidation of information on El Nino 1997 - 1998 impacts. It showed that El Nino 1997-1998 had severe global impact on:

- People (Mortality: 24.000 persons; morbidity: 533.000 persons; affected : 111 Mio persons)
- Material (US 34 billion in losses)
- Land (56 million acres affected)

These impacts could be reduced by improving preparedness, early warning, international and national inter-agency cooperation, technology transfer and

capacity building. More specifically, there is a need for better coping strategies including the strengthening of global climate infrastructure as well as the coordination and integration of climate information, prediction, preparedness, early warning and response.

Studies conducted by the **National Center for Atmospheric Research, USA (NCAR)** highlighted that public awareness on El Nino is quite high and leads to interesting social responses which need, however, to be adjusted. In this regard, the following remarks should be considered:

- El Nino does not represent unusual behavior of the global climate
- El Nino is part of a cycle
- Every weather anomaly throughout the world that occurs during an El Nino year is not necessarily caused by that El Nino
- El Nino has a positive side as well
- There will continue to be surprises associated with further El Nino events
- The impact of global warming on El Nino is not yet known, speculation notwithstanding
- Forecasting El Nino is different than forecasting the impacts of El Nino
- Scientists do not agree on the list of the El Nino years
- Forecasting El Nino's onset does not tell us about its magnitude, duration, or impacts.
- Progress in monitoring El Nino is not matched by progress in forecasting
- El Nino has to faces: (a) as an event, and (b) as a process
- Lessons learned are not conclusive in terms of identifying characteristics and impacts of El Nino
- El Nino Information dissemination through media and web sites requires improvement: the media do not have a neutral interest in reporting El Nino and a pretty web site does not an El Nino expert make! "Buyer Beware".

The **United Nations General Assembly** endorsed a multi-disciplinary and coordinated approach to the phenomenon of El Nino by adopting the resolution 52/200 within the framework of IDNDR. This resolution calls for enhanced international cooperation to reduce El Nino impacts. As a result, an interagency task force on El Nino was established.
In 1998, the Government of Ecuador and the United Nations organized jointly the First Intergovernmental Reunion of Experts on El Nino in Guayaquil, Ecuador where was adopted the Guayaquil Declaration proposing the establishment of an international center of the study of El Nino in Ecuador. Since then, the international community has relentlessly contributed to a better understanding of the El Nino phenomenon.

Conclusions and Recommendations:

- A key aspect for the reduction of the impacts of El Nino is to improve information content and dissemination.
- The United Nations system has to remain the platform for the strengthening of international cooperation to reduce the impacts of the El Nino phenomenon while the international community should provide its technical and financial support in order to put into practice the mandates of the United Nations in this respect.

Task Manager: United Nations Scientific and Technical Committee (STC) on Natural Disaster Reduction

DISASTERS OF THE FUTURE

Task Manager: United Nations Scientific and Technical Commitee (STC) on Natural Disaster Reduction
Moderator: Mr. R. Hamilton, Chair of the STC
Rapporteur: Mr. J.-J. Wagner, Vice Chair of the STC

Speakers:
- Mr. J. Bruce, former Chair, STC, Canada: "*Hydrology, Climatology and the future*"
- Mr. M. Perlo Cohen, Member of the STC, Mexico: "*The State, the Citizen and the Scientists*"
- Mr. Y. Brazhnikov, EMERCOM, Russia: "*Issues of a technogenic and Technological Nature*"
- Mr. P. Recalde, World Food Programme (WFP): "*Increasing Food Security through VulnerabilityAnalysis Mapping*"

Content:

The objective of the session was to provide information on projections and expectations of experts with regard to natural hazards of the 21st century and to our capacities to reduce their expected impact through improvement of global mitigation.

The trend showing a yearly increase of the number of disasters is not going to decay despite the increased mitigation actions undertaken during the IDNDR; this is mainly due to a tremendous growth of the world population and its greater exposure to natural hazards. An aggravating factor is climate changes, which give rise to more extreme natural events. Unless countries, whatever their economic status, integrate mitigation (prevention and preparedness) strategies into a sustainable development, the present situation can only worsen in the future.

UN conventions and agreements such as the Agenda 21, a comprehensive sustainable development action blueprint, can be appropriately used to reduce disaster losses and especially the ones which maybe associated with consequences of **climate variations or changes**. Actions in the framework of convention like the ones on biological diversity or on desertification contribute to the harmonious equilibrium in nature and therefore limit degradations which favor greenhouse effects and consequently reinforce climate changes with all their consequences. It was suggested that a post decade task force should not only include UN Agencies but also NGOs and have good national liaison. Moreover, experts on climate changes should be part of this team.

Natural disaster management within the framework of globalization in a rapidly changing world has positive and negative aspects: easy access to the tremendous communication tools allows people to follow disasters around the planet in near real time, thus enhancing world wide awareness for mitigation, but leads also to a saturation of disaster pictures which become common matters in the eyes of the public. Important natural phenomena, such as Mitch, are transnational and could be, ideally, served by global strategies. Unfortunately globalization of capital flow tends to avoid endangered areas, especially when decision centers are located elsewhere. Global coalitions like IDNR are positive tools that should be developed in appropriate forms for the

future. The World Bank and the reinsurance companies have also started initiatives along those lines. A Global perspective should include local coalitions which are directly in touch with communities.

There is a **growing interaction between natural, environmental and technological hazards**. The vulnerability of the society at large to the result of this interaction could be reduced by improved forecasting as well as improved detection of chain of risks for better safety. In this respect, the IDNDR successor should take into account a multi risk management approach. Entities such as EMERCOM are ready to support this approach with the view to improve disaster reduction strategies for the future.

With regard to **food security**, global vulnerability assessment but also its monitoring are of paramount importance to efficiently solve situations, which could degrade into famine. An appropriate tool for this undertaking is the GIS (Geographical Information Systems) with a broad range of data such as rain forecast, distances between production centers and road network, and also human factors like women involvement in the local society. Used with good indicators and reliable methodologies, the vulnerability analysis mapping provides decision-makers with efficient management tools to reduce the vulnerability of the population with an early response.

Conclusions and Recommendations:

Although risks are on the rise, lessons learnt through IDNDR and the global awareness it created showed that there is no such thing as fatality in natural disasters. Therefore, actors at all levels should be pro-active in incorporating mitigation and reduction of impacts of hazards in the daily life and sustainable development undertakings.