

A faint, light blue world map is visible in the background of the top half of the page.

Chapter

1

Living with risk - focus on disaster risk reduction

- 1.1 Setting the scene - understanding disaster risk reduction
- 1.2 Contexts and processes linked to disaster risk reduction: sustainable development



Eruption of Mount Agung, Bali, Indonesia

Ink painting by Ida Bagus Nyoman Rai (1915-1999)

Mount Agung is Bali's highest and most sacred mountain. In 1963 it erupted for the first time in living memory. Entire villages and temples were toppled or burned under the lava. Those more prepared saved their lives and escaped with only a few possessions.

1.1. Setting the scene – understanding disaster risk reduction

The power and drama associated with natural disasters have always fascinated people. Prior to the widespread use of global communications, disasters seldom had the possibility to influence decisions and events beyond the area of immediate impact. The initial reaction of people who were not immediately affected by the tragedy was to organize urgent specialized services or other forms of help to respond to the needs of the victims.

This chapter intends to set the scene and discuss the strategic shift from disaster management practices towards an integrated disaster risk reduction approach in the context of sustainable development. Further discussion on trends in disaster impact, hazard and vulnerability is developed in chapter two.

- Natural disasters shaping the agenda
- The shift towards disaster reduction
- Reducing the impact of disasters in practice
- International Decade for Natural Disaster Reduction, Yokohama Strategy and Plan of Action
- International Strategy for Disaster Reduction
- Disaster risk reduction - a shared responsibility
- Understanding the meaning of disaster risk reduction
- The disaster risk reduction framework

Natural disasters shaping the agenda

During the final years of the 1990s, several powerful natural disasters occurred in different parts of the world, in countries large and small, industrialized or agrarian, technologically sophisticated or traditionally focused. The types of natural hazards that triggered these disasters varied from the seemingly unexpected occurrence of earthquakes, to more predictable seasonal floods and periodic storms.

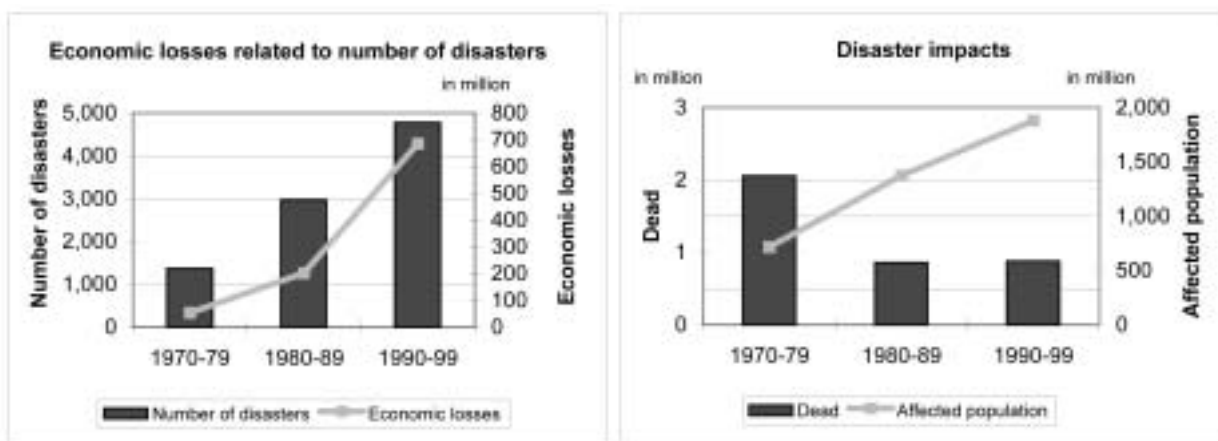
Other less immediate and slowly evolving hazards such as drought and environmental degradation affected even more people with potentially greater costs for their future. More than anything else, the media images of natural disasters at the close of the twentieth century underscored the human consequences and social dimensions of these events.

One need only recall the power of hurricane Mitch that damaged up to 70 per cent of the infrastructure in Honduras and Nicaragua in 1998, devastating the economies of all of the

Central American countries that are yet to recover fully. This was followed one year later by the worst cyclone in 100 years to hit the Indian state of Orissa, which affected ten times as many people as Mitch, destroying 18,000 villages in one night. The powerful typhoon Lingling caused extensive damage and over 500 fatalities in the Philippines and Viet Nam at the end of 2001.

Floods of a previously unremembered scale occurred several times in the past 10 years; in China, Bangladesh and Southern Africa, where people had no recourse but to escape to safety in trees. In 1999, Mexico experienced its worst floods since 1600. Almost 300,000 people were made homeless.

The trend during the last three decades shows an increase in the number of natural hazard events and of affected populations. Even though the number of disasters has more than tripled since the 1970s, the reported death toll has decreased to less than half (see graphics next page).



Source: OFDA/CRED International disaster database, 2002

Includes: drought, earthquake, epidemic, extreme temperature, famine, flood, industrial accident, insect infestation, miscellaneous accident, slide, transport accident, volcano, wave/surge, wild fire, wind storm

Despite losses of US\$ 30 billion in 2000, an amount that must, unfortunately, be termed moderate in comparison to the average of annual losses during the past decade, both the number of major natural disasters and their costs have increased rapidly in recent years.

In 2000, the insurance industry recorded 850 major loss events in the world, one hundred more than the previous record year in 1999. While the losses recorded in 2000 were lower than the US\$ 100 billion incurred in 1999, they provide little comfort to the overall trend during the past decade. Overall the 84 great natural disasters recorded in the 1990s were three times as many as those that occurred in the 1960s, whereas the combined economic losses of US\$ 591 billion were eight times greater than those of the 1960s.

Ten thousand people died in natural disasters in 2000, compared to more than 70,000 in the previous year, or over 500,000 in the previous ten years. These figures must be treated with caution, as the social and economic cost of disasters is difficult to estimate. By and large, insurance claims tend to be misleading as an estimate of the economic impact of disasters. Considering insured damage claims for the 1999 floods in Austria, Germany and Switzerland, at least 42.5 per cent of damage was covered by disaster insurance. But in Venezuela the same year, only four per cent of flood dam-

age was covered. For more information on trends in disaster impact, see chapter two.

Generally, disaster statistics tend to be more precise on a smaller scale; in particular on the national and regional level where the evaluation of damages is undertaken in a more systematic manner, based on agreed methodologies. However, this is not the case in all regions and notably in Africa, where the lack of coherent disaster-related figures means the impact of disasters is highly underestimated. In addition, mega-disasters receive much media attention and the setbacks that these events create in the development process are well noted, while some experts estimate that if the pernicious economic impact of the smaller, but recurrent, disasters were assessed, all of these figures would be much higher.

Not appropriately reflected in these statistics are the millions of poor people who have seen their lives indirectly shattered by the economic impact of the natural disasters, their ability to raise a modest income reduced or annihilated and the prospect to escape poverty postponed indefinitely. These losses, modest in absolute economic terms, are devastating at a social and sometimes political level.

There is a demand for reliable and systematic data on disasters by the development sector to assess their socio-economic impact in the short



Effects of hurricane Mitch in Tegucigalpa, Honduras, 1998

term and, even more importantly, in the long term, if the consequences of the many smaller and unrecorded disasters could be taken into account. While attempted in limited areas, a pressing need remains to consistently document these incremental and often recurrent losses that are continuously eroding the capacities of communities to grow and develop.

While hazards may induce a crisis, it is now widely understood that prevailing conditions within any group of people in a society can determine the extent of their susceptibility or resilience to loss or damage. There is insight across a growing number of professional fields and in some governments that different population segments can be exposed to greater relative risks because of their socio-economic conditions of vulnerability. Because of this, disaster reduction has become increasingly associated with practices that define efforts to achieve sustainable development. Equally, as the possibility of human-induced influences on climate change are better understood, the detrimental effects of forestry exploitation become evident, or the effectiveness of earlier engineering solutions for controlling natural phenomena are questioned, the relationships between human actions, environmental stewardship and disaster risks are becoming ever more crucial.

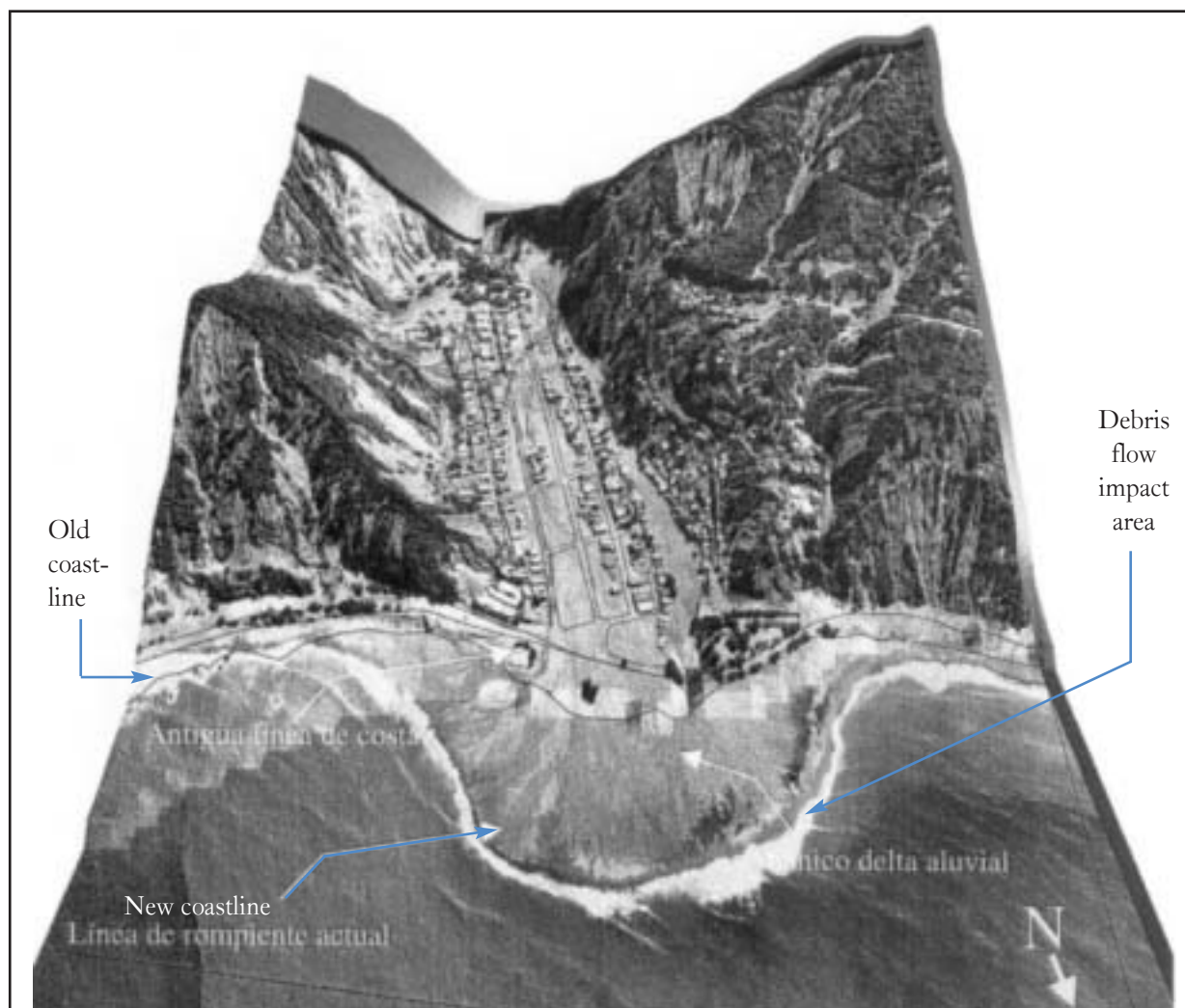
It is remarkable that disasters not only affect the poor and traditionally vulnerable countries but also those thought well protected: Canada,

the Czech Republic, France, Germany, Poland, the United Kingdom and the United States experienced record-setting floods in recent years of such magnitude that previously accepted procedures for protection and thinking about the utility of structural barriers have to be re-evaluated.

The extraordinarily heavy rainfall associated with hurricane Mitch caused a landslide at the Casita volcano in Nicaragua that was 18 km long and 3 km wide, and totally destroyed three towns and killed more than 2,000 people. Torrential rains triggered the landslide of denuded and unstable slopes in Venezuela in 1999 with more than 20,000 fatalities.

Less than two years later, one of the earthquakes in El Salvador caused a landslide on a slope destabilized by deforestation and slope mining, burying almost 500 people living in ill-placed communities that were probably compromised at least in part by lax control of building regulations.

In 2001 similarly disastrous floods and mudslides caused more than 800 fatalities, most extraordinarily in the Algerian capital, Algiers. The most severe winter storms in a century swept through Canada in 1998, through Western European countries in 1999, and the following year in Mongolia, with even greater loss of livelihoods and longer-term consequences because of the decimated flocks of nomadic herders.



The village of Carmen de Uria, Venezuela, was completely covered by the debris flow in December 1999. The location of the former settlement is marked. Source: Prof. Roberto Prado, 1999.

In the past three years, severe earthquakes in Colombia, Greece, India, Peru, Taiwan and Turkey have shaken previously complacent official views on building practices. El Salvador experienced two major earthquakes within one month, one of them measuring 7.6 on the Richter scale, the second strongest in 90 years.

Meanwhile during 2001, persistent drought conditions eroded already fragile livelihoods in Afghanistan (which also experienced an earthquake in 1998 and 2002) and in several other countries of Central Asia, in Eastern and Southern Africa, and in much of Central America. The consequences of uncontrolled wildfire and related conditions of severe atmospheric pollution and haze intruded into neighbouring areas of North-Eastern Africa, Central and North America, South-East Asia, Southern Europe, and within individual states of Australia.

The El Niño/La Niña events of 1997-1998 were the most intense occurrence of this cyclical climatic phenomenon during the twentieth century. Beyond representing economically costly variations to normal climate expectations, these events also created conditions around the world, which spawned extensive flooding, extended drought conditions and widespread wildfires.

The shift towards disaster reduction

In all of these cases the drama of the disasters and the urgent international activities to provide emergency relief assistance, command the attention of the international media – generally only for a few days. The consequences of the disasters last much longer and are more poignantly measured in solitude: lives lost, livelihoods disrupted, property destroyed and often increasingly fragile environments damaged. All of these losses impede the development of the human condition and often sacrifice previously hard-won individual and national accomplishments. They also compromise both immediate and long-term resources upon which current societies, as well as future generations, depend.

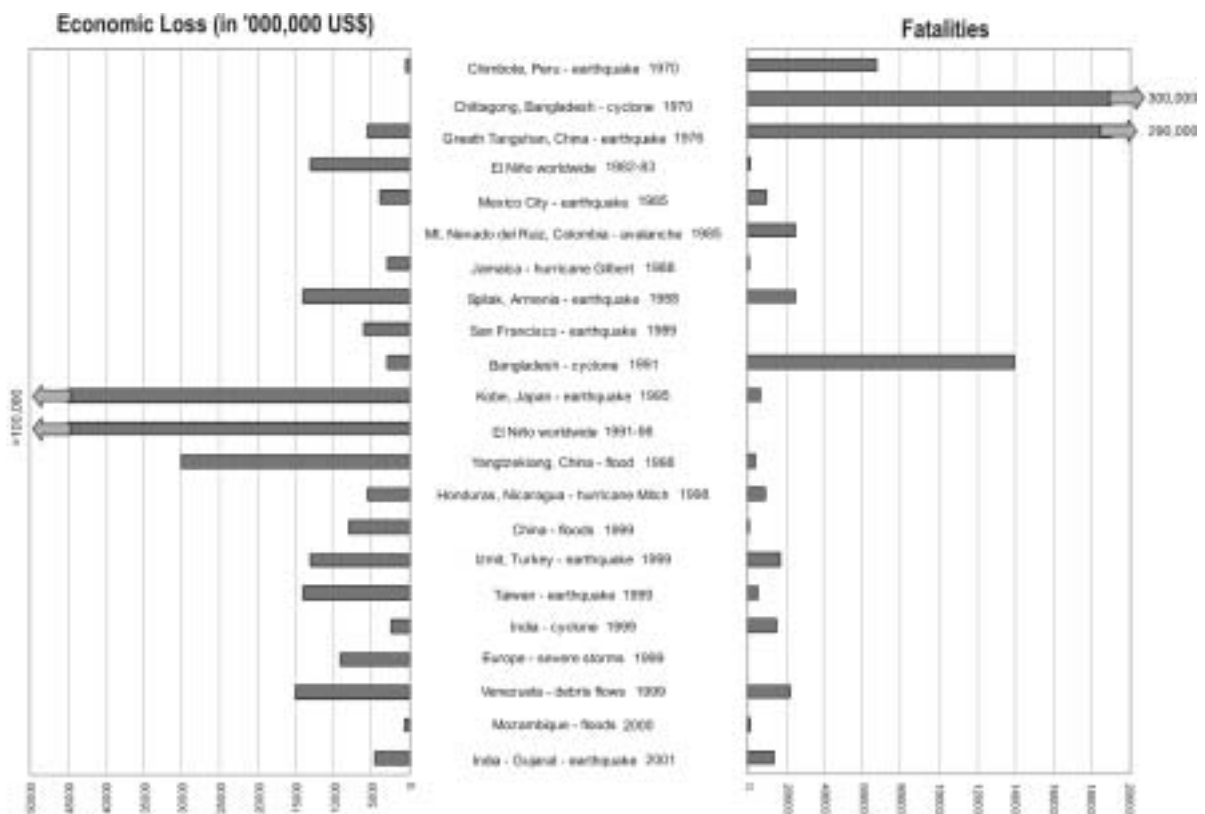
The subject of disaster and risk reduction draws its relevance from earlier contributions and previous practices in the disaster management fields, where traditionally the focus has been on preparedness for response. Before proceeding further though, it is important to establish a common understanding of the basic tenets of disaster reduction that this review addresses. Thus, the review’s outlooks, abilities and practices will be clearly distinguished from the conventional understanding of expressions related to emergency or disaster management issues.

Those closest to affected populations – political authorities, professionals from many different fields, commercial interests, public organizations, educational institutions and local community leaders – are increasingly recognizing the essential public value of sustained efforts to reduce the social, economic and environmental costs of natural disasters. There has, for example, been a tidal change in the understanding of countries in Central America over the past three years, following the repeated devastating effects of natural disasters. There is now increased emphasis placed on risk, and an acceptance that disaster, development and environmental problems are inextricably linked.

Disaster reduction policies and measures need to be implemented, with a twofold aim: to enable societies to be resilient to natural hazards while ensuring that development efforts do not increase vulnerability to these hazards.

This understanding is essential if communities are to become more resilient to the effects of hazards so that disaster losses can be reduced in coming years. These activities make the news much less often, perhaps because they are mostly concerned with people during their ordinary work, focused on incorporating risk awareness into their daily existence.

Some Major Catastrophes in the 20th Century



Learning risk reduction from practices in the past

There are early historical examples of societies protecting their people and their important resources. This was accomplished first, by **anticipating** potential catastrophes based on knowledge of hazardous conditions and possible destructive events, then by investing in protective measures. Inca rulers, living in the Andes between the thirteenth and fifteenth century, took great care to create terraces on steep slopes to conserve the scarce soil and water necessary for their crops. Many of these terraces remain today, as do similar constructions maintained for over a thousand years in the mountain provinces of Indonesia and the Philippines.



Structures were built in places to provide protection from floods, like the embankments in Shanghai and Singapore which have protected lucrative commercial and port activities since the middle of the nineteenth century.

Low countries in Northern Europe, such as the Netherlands, are famous for having constructed an extensive system of sea dykes that have both reclaimed land and protected inhabitants from flooding since the eighteenth century.

In Viet Nam, villagers are obliged to clean, repair and strengthen their crucial irrigation channels and sea dykes prior to the start of every annual cyclone season. This was recognized as a necessary precaution to ensure the continued cultivation of rice, on which the society depends.

Traditionally, Pacific islanders built their houses from local, lightweight, but strong materials that could absorb torrential rains, yield superficially to the high winds of typhoons and withstand the shaking of earthquakes.

Local crop preservation techniques were also used as a hedge against possible drought or other conditions of food shortage.

Traditional practices of farmers around the world have been influenced by locally developed knowledge of weather patterns or naturally occurring indicators in plants and animals, to forecast particularly harsh conditions. If imprecise, such methods did demonstrate an awareness of potential risk that led people to consider alternate courses of action in order to protect their livelihood.

More recently, with the increase of scientific knowledge, policies have developed in some countries that have tried to protect people from or to control the forces of nature. With mixed success over the long term, these efforts grew from concepts seeking to prevent or to reduce the immediate consequences of potentially hazardous conditions and the adverse effects that they could cause to nearby human life, habitation and property.

The Japanese experience of monitoring volcanic activities, early warning and effective evacuation from Mount Usu in Hokkaido is a telling example of how science and technology do save lives and assets.



Long-accepted policy measures and principles designed to prevent forest fires are now understood to have created conditions of fuel accumulation that resulted in more intense, uncontrollable, and ultimately more costly, wildfires at a later date. Now more subtle measures are being employed in managing the relationship between natural fire hazards, human use of forested natural resources and sustainable environmental benefits for a vital society.

Taking these developments into account, during the past 30 years, there has been a continuous evolution in the common understanding and practice of disaster management. To different political constituencies or various professional interests at particular times, there have been many different approaches to addressing catastrophic circumstances from natural hazards and their impacts on societies. These bodies of practice have variously been known as emergency assistance, disaster response, humanitarian assistance, civil defence, civil protection, homeland security and disaster prevention.

Currently, a more holistic approach focussing on risk and vulnerability has brought about the concept of risk reduction or disaster risk management.

There is no doubt that the role of relief assistance during the acute phase of a crisis will remain important and need to be enhanced at all levels. However, the question must be asked: Can modern societies afford to value their social and material assets only **after** they have been lost in a disaster? In many places political commitment and the allocation of resources to address hazardous conditions have been concentrated overwhelmingly on short-term emergency contingencies. Much greater attention will need to be given to protective strategies that can contribute to saving lives and protecting property and resources before they are lost.

From 1990 to 1999, during the *International Decade for Natural Disaster Reduction (IDNDR)* proclaimed by the General Assembly of the United Nations, work was done to advance a wider commitment to activities that could reduce the consequences of natural disasters, under the theme *Building a Culture of Prevention*. The *Yokohama Strategy and Plan of Action for a Safer World* (World Conference on Natural Disaster Reduction, Yokohama, 1994) stressed that every country had the sovereign and primary responsibility to protect its people, infrastructure and national social or economic assets from the impact of natural disasters. Experience gained since then has demonstrated that by focusing on the socio-economic factors involved, human actions can reduce vulnerability of societies to natural hazards and related technological and environmental disasters.

The role of science and technology

The idea of launching a decade dedicated to natural disaster reduction came from the scientific community. It was motivated by a desire to expand the scope and access of scientific and technical abilities and knowledge for disaster reduction into the decision-making processes and wider practical implementation.

Science and technology play key roles in monitoring hazards and vulnerabilities, developing an understanding of their continually changing patterns and in developing tools and methodologies for disaster risk reduction. The dissemination and application of new strategies and measures to protect lives, livelihoods and property within societies experiencing dynamic change are key areas of work for the scientific and technical communities. Scientific knowledge, technical expertise and experiences to reduce risk have to be shared and made widely available as an integral part of multi-disciplinary technical cooperation. Efficient disaster reduction needs a mutually reinforcing interaction between scientists, decision-makers and informed citizens.

However, the limitations of science and technology in responding to the fundamental problems of people and political processes in identifying and managing risk factors need to be carefully considered. An over-concentration on technical abilities at the expense of being able to motivate the human aspects that compose the economic, social and political dimensions of societies will continue to provide disappointing results in effective or sustained commitments to risk reduction. It must also be recognized that in particular circumstances science and technology can be misapplied, sometimes provoking or aggravating risks to a society.

The scientific and technical applications relating to each aspect of disaster risk reduction are extensively addressed throughout this report.

Initially, the *IDNDR* was influenced by largely scientific and technical interest groups. However, a broader global awareness of the social and economic consequences of natural disasters developed as the decade progressed, highlighting the increasing importance of engaging a much broader community in hazard awareness and risk management practices. The importance given to socio-economic vulnerability as a rapidly increasing factor of risk in most of today's societies underlined the need to encourage the wider participation of local communities in hazard and risk reduction activities.



World Conference on Natural Disaster Reduction, Yokohama Strategy and Plan of Action for a Safer World (May 1994)

YOKOHAMA MESSAGE

"We, the States Members of the United Nations and other States, having met at the World Conference on Natural Disaster Reduction, in the city of Yokohama, Japan, from 23 May to 27 May 1994, in partnership with non-governmental organizations, and with the participation of international organizations, the scientific community, business, industry and the media, deliberating within the framework of the International Decade for natural Disaster Reduction, expressing our deep concern for the continuing human suffering and disruption of development caused by natural disasters, and inspired by the Yokohama Strategy and Plan of Action for a Safer World...""adopted the following Principles, Strategy and Plan for Action"

1. Risk assessment is a required step for the adoption of adequate and successful disaster reduction policies and measures.
2. Disaster prevention and preparedness are of primary importance in reducing the need for disaster relief.
3. Disaster prevention and preparedness should be considered integral aspects of development policy and planning at national, regional, bilateral, multilateral and international levels.
4. The development and strengthening of capacities to prevent, reduce and mitigate disasters is a top priority area to be addressed so as to provide a strong basis for follow-up activities to the IDNDR.
5. Early warnings of impending disasters and their effective dissemination are key factors to successful disaster prevention and preparedness.
6. Preventive measures are most effective when they involve participation at all levels from the local community through the national government to the regional and international level.
7. Vulnerability can be reduced by the application of proper design and patterns of

development focused on target groups by appropriate education and training of the whole community.

8. The international community accepts the need to share the necessary technology to prevent, reduce and mitigate disaster.
9. Environmental protection as a component of sustainable development consistent with poverty alleviation is imperative in the prevention and mitigation of natural disasters.
10. Each country bears the primary responsibility for protecting its people, infrastructure, and other national assets from the impact of natural disasters. The international community should demonstrate strong political determination required to make efficient use of existing resources, including financial, scientific and technological means, in the field of natural disaster reduction, bearing in mind the needs of the developing countries, particularly the least developed countries.

Basis for the Strategy:

"Natural disasters continue to strike and increase in magnitude, complexity, frequency and economic impact. Whilst the natural phenomena causing disasters are in most cases beyond human control, vulnerability is generally a result of human activity. Therefore, society must recognize and strengthen traditional methods and explore new ways to live with such risk, and take urgent actions to prevent as well as to reduce the effects of such disasters. The capacities to do so are available."

Although articulated in 1994, the principles contained in the *Yokohama Strategy and Plan of Action for a Safer World* are possibly more relevant to risk reduction now than when they were conceived.



The International Strategy for Disaster Reduction

IDNDR provoked the recognition that disaster reduction was a social and economic imperative that would take a long time to fulfil.

As the successor to IDNDR in 2000, the United Nations *International Strategy for Disaster Reduction (ISDR)* was designed to foster this need by proceeding from the previous emphasis of protection against hazards to the processes involved in the awareness, assessment and management of disaster risks.

This development highlights the integration of disaster risk reduction into the broader context of sustainable development and related environmental considerations. By means of this *global review of disaster reduction initiatives*, ISDR seeks to further multidisciplinary advocacy for wider professional understanding of disaster risk reduction practices which can be achieved by working through political, professional, institutional and public collaboration.

ISDR in a nutshell

The International Strategy for Disaster Reduction was launched by the General Assembly of the United Nations to provide a global framework for action with the objective of reducing human, social, economic and environmental losses due to natural hazards and related technological and environmental phenomena. The ISDR aims at building disaster resilient communities by promoting increased awareness of the importance of disaster reduction as an integral component of sustainable development. In January 2000, through its resolution 54/219, the General Assembly established two mechanisms for the implementation of the ISDR, the Inter-Agency Secretariat and the Inter-Agency Task Force on Disaster Reduction. This was reconfirmed in resolution 56/195 in December 2001. ISDR builds on the learning from IDNDR, the Yokohama Strategy and Plan of Action and the Geneva Mandate of 1999.

The General Assembly also calls upon governments to establish national platforms or focal points for disaster reduction, and to strengthen them where they already exist, with a multisectoral and inter-disciplinary approach.

(a) the *Inter-Agency Secretariat for the ISDR (UN/ISDR)*

The UN/ISDR is the focal point within the United Nations system for co-ordination of strategies and programmes for disaster reduction and to ensure synergy between

disaster reduction activities and those in the socio-economic and humanitarian fields.

The secretariat also serves as an international clearinghouse for the management and the dissemination of information, in particular on current knowledge and status of disaster reduction through the publication of this *global review of disaster reduction initiatives*. It develops activities such as advocacy campaigns to promote wider understanding about natural hazards and disaster risk to motivate a world-wide commitment to disaster reduction. A particularly important role is to encourage both policy and awareness activities by promoting national committees dedicated to disaster reduction, and working in close association with regional initiatives. An outreach programme has been established in Latin America and the Caribbean to this effect, and plans are underway to collaborate with additional regional institutions in Africa and in the Asia and Pacific regions.

The ISDR secretariat has a facilitating role, bringing agencies, organizations and different disciplines together, providing a common platform and understanding of the scope of disaster risk reduction. In this regard, one main function of the secretariat is to support the Inter-Agency Task Force (IATF) for the development of policies on natural disaster reduction.



(b) the *Inter-Agency Task Force on Disaster Reduction (IATF/DR)*

The Task Force was established in 2000 as the main forum within the United Nations system for devising strategies and policies for the reduction of natural hazards. It is also tasked with identifying what is lacking to improve disaster reduction policies and programmes and recommending remedial action with particular attention to ensuring complementary action by the different United Nations agencies involved in disaster reduction.

The Task Force is chaired by the Under-Secretary General for Humanitarian Affairs of the United Nations and is composed of up to 14 representatives of agencies and organizations of the United Nations system; up to eight representatives from regional entities and up to eight representatives of civil society and relevant professional sectors. The Director of the ISDR secretariat acts as the Secretary of the Task Force.

The Task Force has established four Working Groups to work on climate variability, early warning, vulnerability and risk analysis, and wild-land fires. More details on their work are outlined in other chapters of this review.

The Task Force has since its first meeting expressed interest in pursuing additional areas, as opportunities allow. These include drought, ecosystem management, land-use planning, integrating disaster reduction issues into sustainable development and national planning agendas, raising the political profile of disaster reduction or exploring private and public sector partnerships.

Framework for action for the implementation of the ISDR

The IATF/DR, supported by the secretariat, has formulated a framework for action for the implementation of the ISDR with four main objectives:

- Increase public awareness to understand risk, vulnerability and disaster reduction.
- Promote the commitment of public authorities to disaster reduction.
- Stimulate multidisciplinary and intersectoral partnerships, including the expansion of risk reduction networks.
- Improve scientific knowledge about the causes of natural disasters, as well as the effects that natural hazards and related technological and environmental disasters have on societies.

The framework also incorporates two additional activities specifically mandated to the ISDR secretariat by the United Nations General Assembly:

- Continue international co-operation to reduce the impact of El Niño and other climate variations.
- Strengthen disaster reduction capacities through the development of early warning systems.

In pursuing these objectives, the framework for action outlines the following areas of common concern:

- Incorporating the recognition of the special vulnerability of the poor in disaster reduction strategies
- Environmental, social and economic vulnerability assessment with special reference to health and food security;
- Ecosystems management, with particular attention given to the implementation of Agenda 21;
- Land use management and planning, including appropriate land use in at-risk rural, mountain and coastal areas, as well as unplanned urban areas in megacities and secondary cities;
- National, regional and international legislation with respect to disaster reduction.

Disaster risk reduction - a shared responsibility

Governments and communities must understand that disaster reduction policy is a wise investment. Direction and resource allocations often need to be provided from higher levels of authority within a society, as much as decisions and individual commitment need to grow from the local understanding and active participation of those people most immediately affected by disaster risks.

Where governments have not done so already, there is a need to regain a level of wide and inclusive national participation, before a disaster occurs. This public responsibility will require a collective discipline that can be sustained through the education and practice of many trades and professions.

Since disaster reduction is based on a continuous strategy of vulnerability and risk assessment, many actors need to be involved, drawn from governments, technical and educational institutions, professions, commercial interests and local communities. Their activities will need to be integrated into planning and development strategies that both enable and encourage the widespread exchange of information. New multidisciplinary relationships are essential if disaster reduction is to be both comprehensive and sustainable.

Vulnerability to disasters should be considered in a broad context encompassing specific

human, social/cultural, economic, environmental and political dimensions, that relate to inequalities, gender relations and ethical and racial divisions. A disaster with all its negative consequences offers a good opportunity to formulate forward-looking policy concepts pertaining to social development and equity, economic growth, environmental quality and justice, i.e. sustainability.

However, to be successful, the integration of holistic disaster reduction strategies into development policies should happen from the outset, thereby solving a broad range of social, economic and environmental problems as well. This requires the participation of all relevant sectors (such as environment, finance, industry, transport, construction, agriculture, education and health). It also requires different forms of management than in the case of emergency or disaster management. The responsibilities of risk reduction are even more broadly extended than is commonly understood.

This is why the most efficient forms of hierarchical "command and control" practices for crisis management are much less suited to the deliberate and more widely considered forms of public, private and professional participation in risk reduction which draw their information and inspiration from many different sources in a society. The following chart outlines some of these comparisons in management approaches (Jeggle 2001):

Emergency assistance, crisis management	Disaster risk reduction strategies
Primary focus on HAZARDS and DISASTER events.	Focus on VULNERABILITY and RISK issues.
Single, event-based scenarios.	Dynamic, multiple risk issues and development scenarios.
Basic responsibility to respond to an event.	Fundamental need to assess, monitor, update.
Often fixed, location-specific conditions.	Extended, changing, shared or regional, local.
Responsibility in single authority or agency.	Involves multiple authorities, interests, actors.
Command and control, directed operations.	Situation-specific functions, free association.
Established hierarchical relationships.	Shifting, fluid and tangential relationships.
Often focused on hardware, equipment.	Dependent on related practices, abilities, software.
Specialized expertise.	Specialized expertise, squared with public views.
Urgent, immediate-to-short time frames in outlook, planning, attention, returns.	Comparative, moderate-to-long time frames in outlook. Planning, values, returns.
Rapidly changing, dynamic information usage. Often conflicting or "sensitive". Primary, "authorized" or singular sources. Need for definitive "facts".	Accumulated, historical, layered-updated, comparative, information. Open or public. Multiple and diverse or changing sources. Differing perspectives, points of view.
Operational, or public information-based use of communications.	Multiple-use, shared exchange, intersectoral use of information. Matrix, nodal communication.
In-out, or vertical flows of information.	Dispersed, lateral flows of information.
Matters of public security, safety.	Matters of public interest, investment and safety.



■ Understanding the meaning of disaster and risk reduction

Difference between a hazard and a disaster

“Strictly speaking, there are no such things as natural disasters, but there are natural hazards.

A disaster is the result of a hazard’s impact on the society. So the effects of a disaster are determined by the extent of a community’s vulnerability to the hazard (or conversely, its ability, or capacity to cope with it). This vulnerability is not natural, but the result of an entire range of constantly changing physical, social, economic, cultural, political, and even psychological factors that shape people’s lives and create the environments in which they live. ‘Natural’ disasters are nature’s judgement on what humans have wrought”

John Twigg

Disaster reduction strategies include, first and foremost, vulnerability and risk assessment, as well as a number of institutional capacities and operational abilities. The assessment of the vulnerability of critical facilities, social and economic infrastructure, the use of effective early warning systems, and the application of many different types of scientific, technical, and other skilled abilities are essential features of a disaster reduction strategy.

The sharing of information and experience, both for the purposes of public information and all forms of education and professional training are as important for creating a safety culture, as are the crucial involvement of local community action and new forms of partnership motivated by cooperation and shared responsibilities.

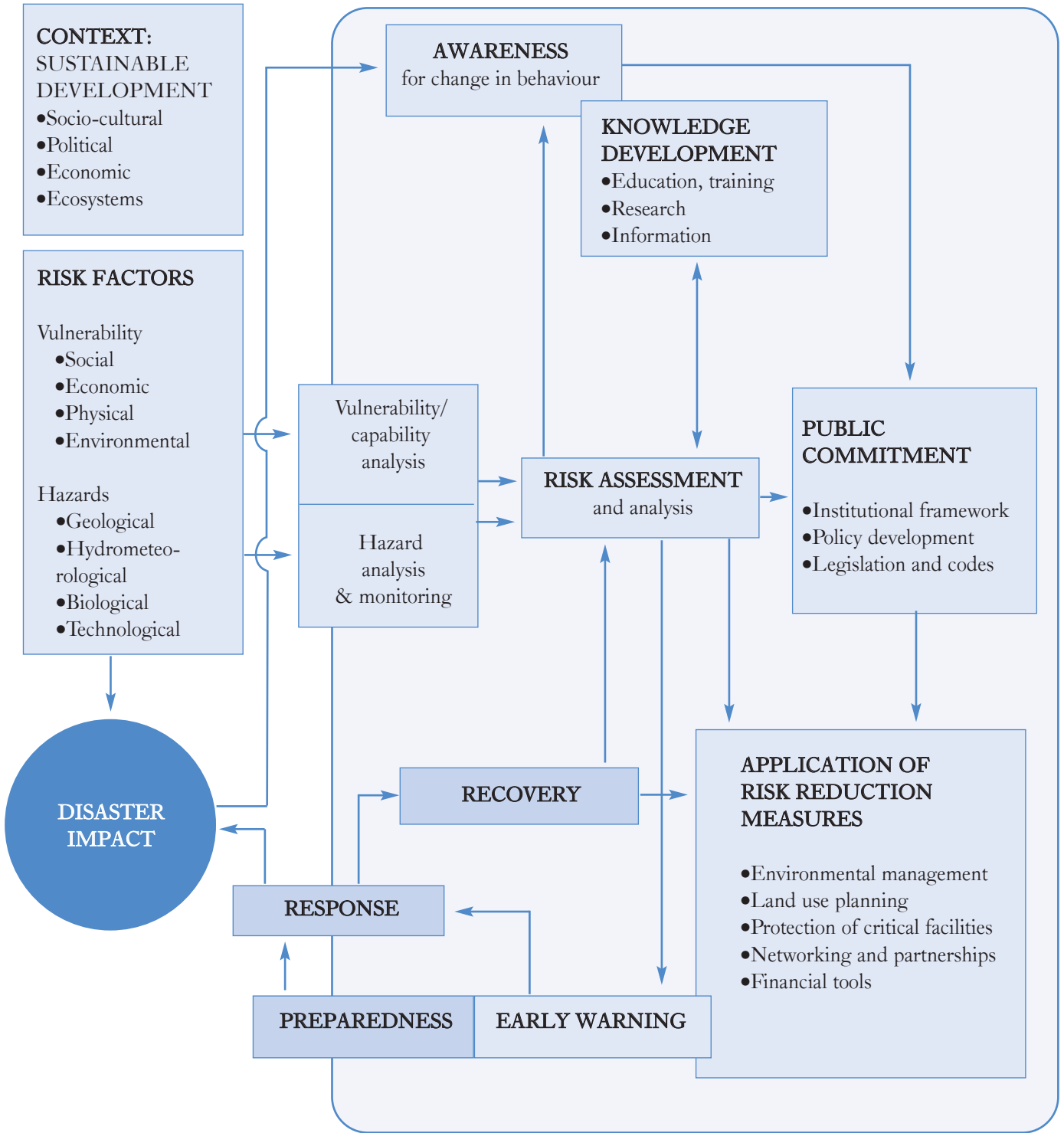
Fortunately, modern forms of information access and communications can facilitate the wider exposure and networking that these new and shifting forms of association require. Above all, despite these many contributions, functions associated with disaster reduction need to be viewed not as an expense, but as an investment in a society’s future.

As common as all of these attributes are to any sustained strategy of disaster reduction, one must also take account of the various political, cultural, and social distinctions that exist among all countries. There are fundamental elements in every disaster reduction strategy, but the priorities, relative emphasis, available resources, and specific ways of implementation must take account of practices that are most suited to local conditions, understanding and effectiveness.

The graphic representation on next page describes the main context and activities involved in disaster risk reduction. These are elements to take into consideration for any disaster risk reduction strategy. The sections of the global review have been organized around these issues, with exception of preparedness, response and recovery initiatives.



FRAMEWORK FOR DISASTER RISK REDUCTION





Defining a few key terms

One of the continuous functions of the ISDR is to support a more homogeneous use of disaster related terms. This Global Review, provides concise definitions, based on a broad collection of different international sources, in order to create a common terminology on disaster reduction issues, useful for the public, authorities and practitioners. This effort will be continued in future reviews and answers a need expressed in several international forums, regional commentary and national responses to the ISDR questionnaire. Key terms used in this review are explained below. Definitions of additional terms can be found in Annex 1.

Hazard

A potentially damaging physical event, phenomenon or human activity, which may cause the loss of life or injury, property damage, social and economic disruption or environmental degradation.

Hazards can include latent conditions that may represent future threats and can have different origins: natural (geological, hydrometeorological and biological) and/or induced by human processes (environmental degradation and technological hazards). Hazards can be single, sequential or combined in their origin and effects. Each hazard is characterised by its location, intensity and probability.

Vulnerability

A set of conditions and processes resulting from physical, social, economical and environmental factors, which increase the susceptibility of a community to the impact of hazards.

Positive factors, that increase the ability of people and the society they live in, to cope effectively with hazards, that increase their resilience, or that otherwise reduce their susceptibility, are considered as capacities.

Risk

The probability of harmful consequences, or expected loss (of lives, people injured, property, livelihoods, economic activity disrupted or environment damaged) resulting from interactions between natural or human induced hazards and vulnerable/capable conditions. Conventionally risk is expressed by the equation $\text{Risk} = \text{Hazards} \times \text{Vulnerability} / \text{Capacity}$

Beyond expressing a probability of physical harm, it is crucial to appreciate that risks are always created or exist within social systems. It is important to consider the social contexts in which risks occur and that people therefore do not necessarily share the same perceptions of risk and their underlying causes.

Risk assessment/analysis

A process to determine the nature and extent of risk by analysing potential hazards and evaluating existing conditions of vulnerability/capacity that could pose a potential threat or harm to people, property, livelihoods and the environment on which they depend.

The process of conducting a risk assessment is based on a review of both technical features of hazards such as their location, intensity and probability, and also the analysis of the physical, social and economic dimensions of vulnerability, while taking particular account of the coping capabilities pertinent to the risk scenarios.

Coping capabilities/Capacity

The manner in which people and organisations use existing resources to achieve various beneficial ends during unusual, abnormal, and adverse conditions of a disaster event or process.

The strengthening of coping capacities usually builds resilience to withstand the effects of natural and other hazards.

Resilience/resilient

The capacity of a system, community or society to resist or to change in order that it may obtain an acceptable level in functioning and structure. This is determined by the degree to which the social system is capable of organising itself, and the ability to increase its capacity for learning and adaptation, including the capacity to recover from a disaster.

Disaster

A serious disruption of the functioning of a community or a society causing widespread human, material, economic or environmental losses which exceed the ability of the affected community/society to cope using its own resources.

A disaster is a function of the risk process. It results from the combination of hazards, conditions of vulnerability and insufficient capacity or measures to reduce the potential negative consequences of risk.

Risk management

The systematic management of administrative decisions, organisation, operational skills and responsibilities to apply policies, strategies and practices for *disaster risk reduction*.

Disaster risk reduction (disaster reduction)

The systematic development and application of policies, strategies and practices to minimise vulnerabilities and disaster risks throughout a society, to avoid (prevention) or to limit (mitigation and preparedness) adverse impact of hazards, within the broad context of sustainable development.

Prevention

Activities to provide outright avoidance of the adverse impact of hazards and related environmental, technological and biological disasters.

Depending on social and technical feasibility and cost/benefit considerations, investing in preventive measures is justified in areas frequently affected by disaster. In the context of public awareness raising

and education, prevention refers to attitude and behaviour leading towards a “culture of prevention”.

Mitigation

Structural and non-structural measures undertaken to limit the adverse impact of natural hazards, environmental degradation and technological hazards.

Preparedness

Activities and measures taken in advance to ensure effective response to the impact of disasters, including the issuance of timely and effective early warnings and the temporary removal of people and property from a threatened location.

Early warning

The provision of timely and effective information, through identified institutions, that allow individuals at risk of a disaster, to take action to avoid or reduce their risk and prepare for effective response.

Early warning systems consist of three elements (i) forecasting and prediction of impending events, (ii) processing and dissemination of warnings to political authorities and population, and (iii) undertaking appropriate reaction to warnings.