



Preface

A journey to a safer world

Living with risk – disaster reduction strategy

A disaster reduction strategy is a global challenge today and for the future. It involves every human community, and almost every human endeavour. It also involves almost every physical phenomenon on the planet, from the high stratosphere to the abyssal depths.

The challenge of a disaster reduction strategy – and the theme of this review – is to find a way to live with these phenomena, rather than die from them. The earthly powers are not just a fact of life, but one side of the coin of a good life and a “natural” disaster is only a disaster because people happened to be in the way – or had no other choice – and were caught unawares when it happened.

The UN International Decade for Natural Disaster Reduction (IDNDR), 1990-99, was a decade dedicated to promoting solutions to reduce risk from natural hazards. At the doorstep of the new millennium, the decade ended with more deaths from more disasters, involving greater economic losses and more human dislocation and suffering than when it began. But could dedicating one decade to the topic be expected to solve the consequences of centuries of mismanagement and of passive fatalism before the vagaries of nature?

What the IDNDR put in motion was an irreversible and beneficial political and social process. That is what this review and the International Strategy for Disaster Reduction will build upon: foster more awareness, more public commitment, more knowledge and partnerships to implement risk reduction measures of all kinds, at all levels.

Earthly powers that offer wealth – and hazard

This is the paradox of a living planet: The earthly powers that create wealth and fuel human security can also destroy it, depending on the ability of human-kind to cope and to live with risk.

The subterranean violence beneath the famous Pacific “ring of fire” also created the sublime landscapes of Japan and Kamchatka, Sumatra and New Zealand, from Alaska, Seattle and Puget Sound to San Francisco, Valparaiso and Tierra del Fuego.

The heat of the sun evaporates the top metre or more of all the oceans of the world, every year. It also drives powerful winds, and clouds that carry torrential rain. At intervals the swollen rivers flood and deposit rich silt on what geographers call flood plains and farmers call fertile soil. In time, such wind and rain will erode all mountains, and remove the differences that drive regional climates. Fortunately, the process of mountain building goes on, accompanied, of course, by earthquakes that lift bedrock towards the skies and volcanic discharges that deliver new minerals to the soil and new moisture to the air.



A more vulnerable world

The trend shows increasing losses from disasters (see chapter 2). The reason is both simple and complex – it has to do with how people and societies are becoming more vulnerable. Although the frequency of dramatic natural events may be constant, human activities contribute to their increased intensity. It depends on development practices, environmental protection, regulated growth of cities, distribution of people and wealth in the safest places, and government structures. Human activity also has an impact on the planet's climate, which will result in increased sea levels and potential disasters.

The number of people at risk has been growing by 70 to 80 million per year. More than 90 per cent of population growth is in the developing world, among people with the smallest share of resources and the biggest burden of exposure to disasters.

In theory, natural hazards, including earthquakes, floods, drought, storms, tropical cyclones and hurricanes, storm, wildfire, tsunami, volcanic eruptions and avalanches, can threaten everyone. In practice, proportionally, they tend to hurt the poor most of all. This is because the poor outnumber the rich, and live in greater density in more poorly built housing on land most at risk.

The price of life, like the price of liberty, is constant vigilance. Natural hazards are constant threats. But every year the potential loss to life and livelihood soars as people converge in cities, where now half of the people of the planet live. With the growth of the cities, and population, come changes in the landscape – and the disruption of natural ecosystems.

Hillsides are cleared of trees for building materials and firewood, but not replanted. Wetlands are drained to make space for new housing or workplaces. Rivers are engineered to follow unnatural routes. But with no trees, there is more erosion, and more silt to clog the rivers. All of these things make landslides, floods or drought more likely – and when they happen, more devastating.

People who have to struggle every day just to survive do not have the time or the strength to worry about more distant environmental and natural hazards. So a disaster reduction strategy is inseparable from social and economic development, and from thoughtful environmental management. These three things are at the heart of sustainable development.

A disaster reduction strategy must therefore be built on sustainable development policies, which take into account the potential risks for disasters and plan to reduce these risks, involving everyone and providing not just help but hope.





“Imagine all the people...”

It would be quite possible to imagine a community or even a nation that lived with a regard for nature, despite its hazards, thanks to a coherent disaster risk reduction strategy in place.

Housing would be built out of appropriate materials, adapted to local conditions and according to building codes. Its houses, hospitals, schools, markets, factories, government offices, power supplies and other critical services would be on the sites least exposed to risk.

Inhabitants would maintain forested or wetland areas as a form of natural flood control, as sources of local renewable revenue, and as security against other threats such as erosion and landslide.

People and government officials would be aware that a hazard that threatened one family or settlement would also be a threat to all. They would maintain a network of early warning and watchfulness, linked to the experts who monitored weather signals or seismic instruments.

Elected or traditional leaders would have regular dialogue not just with local, regional or national government officials and citizens, but also with the government agencies and scientists. Village councils would have ensured structures that serve as safe shelters in a cyclone, or ground safe for livestock in the event of flood. Schools would teach children what to do when the river rises, or the earth begins to shake. Farmers would have granaries or fodder stores safe from storm and above any likely flood level.

Health facilities would be safe, and health centres would work with communities to reduce risk from disaster. Householders would have small but secure savings to help them through disruption caused by storm or inundation.

These communities would accept that information and communication were the most important elements of all. People would routinely listen to daily weather reports, and follow local political and economic debate through radio, newspapers or television. Such communities would be more likely to shore up their own flood defences, maintain their drainage or secure their own housing against destruction, by communal action. Legislators would understand that public safety was part of their obligation and administrators, of course, would be expected to police such legislation.

It is possible...

Safer communities, living with acceptable risk, do exist in, among other places, New Zealand, California, Japan, along the Gulf of Mexico and among the low-lying coastal regions of western Europe. All these regions are potentially vulnerable to natural hazard. All have suffered from the impacts of major natural disasters but have met them with lower loss of life and greater economic resilience. The difference is that these places belong to richer nations – rich enough to believe that life can and will always improve. Economic wealth is not the only factor in reducing risk. Political will and a communal sense of hope are part of the collective protection against calamity.

Chile and Colombia have local disaster risk management committees watching for future trouble. Bangladesh long ago established a local early warning system to alert the millions at risk when floods and tropical cyclones threaten. Safer from the hazards of weather or tectonic forces, people can begin to build more economically secure lives for themselves and their children.

So, disaster reduction measures are intricately linked with sustainable economic development.



Journey to a safer world

This review, aimed mainly at practitioners as a guide and reference, is about how we can continue to develop a “culture of prevention”. It is a voyage of both discovery and rediscovery, about how human decisions increase or reduce vulnerability to natural hazards. It illustrates lessons and experiences in disaster risk reduction. It explores the way in which the understanding of disaster management and risk has evolved over recent years. It takes account of the technologies of the future – the satellite sensors that might read telltale signs of volcanic activity, seismic shift or collapsing hillsides days or weeks before any catastrophe occurs, or telemetry that can monitor the build up of soil moisture in a watershed that could serve as a warning of sudden flooding downstream.

Most of all, it looks at how societies organize themselves, how communities interact with each other, how civic and national authorities respond to the challenges of natural hazard. It will explore the mosaic of interests, the kaleidoscope of attitudes and the network of actors that must be mobilised towards risk reduction and disaster prevention, rather than assessing the need for disaster relief.

It is, at bottom, about foreseeing danger and averting it. It will consider how warnings proceed from the work of technical specialists to the government authorities and from these to the people at risk. It will consider the political short-sightedness and the errors of thinking – the increasing vulnerabilities and the unmet challenges – that turn environmental degradation, natural and technological hazards into social and economic disasters in different cultures and societies.

It will begin to explore the different strategies demanded by different kinds of human and environmental conditions. But it will also address a set of universal truths. Any disaster reduction strategy demands first of all political will to recognise and address the issues of risk. This calls for statesmanship rather than political shrewdness. This commitment must then be linked to national and local development planning and sustainable action.

It builds on an understanding that risk reduction and disaster prevention always make better economic sense than reliance on disaster relief. Although small groups cooperate spontaneously because of immediate shared danger, larger societies need coherent legal obligations and responsibilities that foster the involvement of the community, and the participation of its people to face long term risks.

None of these things can happen without some form of public debate and education at every level of society. It will require shared thinking at both international and regional levels because nations often share a forested terrain, or a river, or two sides of a mountain chain. Inevitably, they have a common interest in disaster prevention. It will also require new ways of looking at the landscape, with an eye not just to how it might be exploited but also at the price it might exact for the wrong kind of exploitation.

Secure societies are those that have learned to live with their land, as well as from it. Disaster reduction strategies will have succeeded when people – governments, specialists, leaders and citizens – understand that a “natural disaster” is more a failure of foresight or evidence of their own neglected responsibility rather than the presumed consequence of natural forces or some other-worldly act of god.

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.