Chapter 1
DEVELOPMENT AT RISK

1.1 Natural Disaster as a Cause and Product of Failed Development

Natural disaster is intimately connected to the processes of human development. Disasters triggered by natural hazards put development gains at risk. At the same time, the development choices made by individuals, communities and nations can pave the way for unequal distributions of disaster risk.

Meeting the Millennium Development Goals (MDGs) is extremely challenged in many communities and countries by losses from disasters triggered by natural hazards. The destruction of infrastructure, the erosion of livelihoods, damage to the integrity of ecosystems and architectural heritage, injury, illness and death are direct outcomes of disaster. But disaster losses interact with and can also aggravate other stresses and shocks such as a financial crisis, a political or social conflict, disease (especially HIV/AIDS), and environmental degradation. And such disaster losses may set back social investments aiming to ameliorate poverty and hunger, provide access to education, health services, safe housing, drinking water and sanitation, or to protect the environment as well as economic investments that provide employment and income.

At the same time, it has been clearly demonstrated how disaster risk accumulates historically through inappropriate development interventions. Every health centre or school that collapses in an earthquake and every road or bridge that is washed away in a flood began as development activities. Urbanisation and the concentration of people in hazard prone areas and unsafe buildings, increases in poverty that reduce the human capacity to absorb and recover from the impact of a hazard, and environmental degradation that magnifies hazards such as floods and droughts, are only a few examples of how development can lead to disaster risk.

The relationship of development and disaster risk can be seen by a quick review of data produced by this Report. About 75 percent of the world's

population live in areas affected at least once between 1980 and 2000 by earthquake, tropical cyclones, flood or drought. As a result of disasters triggered by these natural hazards, more than 184 deaths per day were recorded in different parts of the world. Deaths indicate only the tip of the iceberg in terms of losses in the quality of life, livelihoods and economic development, and are unevenly distributed around the world. While only 11 percent of the people exposed to natural hazards live in low human development countries, they account for more than 53 percent of total recorded deaths. Development status and disaster risk are clearly closely linked.

Appropriate development policies that reduce disaster risk can therefore make an important contribution toward the achievement of the MDGs by reducing losses and protecting existing development gains as well as avoiding the generation of new risks. The reduction of disaster risk and sustainable human development are therefore mutually supportive goals that also contribute to the reduction of poverty, the empowerment of marginalised social groups and gender equality. Disaster risk reduction can make a particularly critical difference for highly vulnerable populations, for example those living in small island developing states or societies weakened by armed conflict and HIV/AIDS.

Disasters are still usually perceived as exceptional natural events that interrupt normal human development and require humanitarian actions to mitigate loss. While this Report acknowledges the increasing impact of natural disasters on development, its focus is on how development itself shapes disaster risk. This Report demonstrates that countries with similar patterns of natural hazard have widely varying levels of disaster risk and that these risks have been shaped through development paths and processes. The key message of this Report is that disaster risk is not inevitable, but on the contrary, can be managed and reduced through appropriate development policy and actions.

Through publishing this Report, UNDP thus seeks to demonstrate through quantitative analysis and documented evidence that disaster risk is an *unresolved problem of development* and to identify and promote development policy alternatives that contribute to reducing disaster risk.

The Report addresses four key questions:

- How are disaster risks and human vulnerability to natural hazards distributed globally between countries?
- What are the development factors and underlying processes that configure disaster risks and what are the linkages between disaster risk and development?
- How can appropriate development policy and practice contribute to the reduction of disaster risks?
- How can disaster risk assessment be enhanced in order to inform development policy and practice?

The **Disaster Risk Index** (DRI), which is presented as the centrepiece of this Report, is a first step in addressing these questions. The DRI provides the first global assessment of disaster risk factors through a country-by-country comparison of human vulnerability and exposure to three critical natural hazards: earthquake, tropical cyclones and flooding, and the identification of development factors that contribute to risk. Volcanic eruption is important internationally, but lacks sufficient data for analysis at this time (see Technical Annex). Similarly, the development of a drought DRI revealed a series of unresolved methodological and conceptual challenges, which imply that its results do not yet have the required degree of confidence. Nevertheless, the exploration of these challenges in itself provides important insights into drought risk and vulnerability and is presented in the Report as a work in progress. Reliance on internationally available data and the use of human deaths as a proxy for disaster losses meant that certain types of disasters were excluded from the model. An example of this is fire, which can cause widespread damage with few deaths.

DRI builds on UNDP experience with the Human Development Index (HDI). Just as with the HDI, this first report on DRI should be seen as an initial step towards measuring global disaster risks. Its value is as much in flagging data needs to support decision making at the sub-national, national and international levels, as it is in contributing to the process of mapping international patterns of disaster risk.

1.2 Outline of the Report

Chapter 1 is divided into three sections. The first section presents the objective of the Report in advocating for the importance of disaster risk as a component in meeting the MDGs. The second section contextualises

the Report by offering definitions of terms and commenting on links with similar projects being undertaken by other international agencies. The third section outlines a conceptual framework for the Report and maps out the relationship between disaster risk and human development.

Chapter 2 reviews the findings of the DRI. This is a first step in achieving a worldwide accounting tool for development and disaster risk status. In addition to starting the process of mapping global patterns of risk and vulnerability, this exercise flags key gaps in knowledge and indicates the national mechanisms needed to enhance data collection.

Chapter 3 explores the development processes that contribute to the configuration of disaster risk, as identified in the DRI. It also allows for the examination of pressures known to shape risk that could not be included in the DRI through lack of international data. Perhaps most important of these is the overarching role of governance. The second role of Chapter 3 is to present examples of good practice in disaster risk reduction projects undertaken within a developmental approach. This material supports a growing number of accounts of best practice including recent reviews undertaken by the International Strategy for Disaster Reduction (ISDR), The International Federation of Red Cross and Red Crescent Societies (IFRC) and The Department for International Development (DFID).[1]

Chapter 4 returns to the key needs identified in Chapter 1 for disaster risk reduction to be appropriately mainstreamed into development policy. Building on these arguments and informed by the evidence presented in Chapters 2 and 3, key policy recommendations are advocated.

The Technical Appendix sets out in detail the methodology used to identify vulnerability factors and model national levels of disaster risk in the DRI. Progress made on the modelling of a multi-hazard DRI is also reported.

The conceptual framework of disaster risk used in the Report is outlined in Chapter 2. At the same time, a formal glossary of terms is presented at the end of the Report. However, it is helpful to outline five key terms here.

Natural disaster is understood to be an outcome of natural hazard and human vulnerability coming together, the coping capacity of society influences the extent and severity of damages received.

Natural hazards are natural processes or phenomena occurring in the biosphere that may constitute a damaging event and that in turn may be modified by human activities, such as environmental degradation and urbanisation

Human vulnerability is a condition or process resulting from physical, social, economic and environmental factors, which determine the likelihood and scale of damage from the impact of a given hazard. Human vulnerability includes within it the vulnerability of social and economic systems, health status, physical infrastructure and environmental assets. It is possible to look at these subsets of vulnerable systems in isolation, but here we are concerned with the broad picture of human vulnerability.

Coping capacity is the manner in which people and organisations use existing resources reactively, to limit losses during a disaster event. To this can be added *adaptive capacity,* which points to the possibility for society to redirect its activities proactively, to shape development in a way that minimises the production of disaster risk.

1.3 Disaster Losses are Increasing

Over the last quarter century, the number of reported natural disasters and their impact on human and economic development worldwide has been increasing yearly. Existing records, while less reliable before 1980, can be traced back to 1900. This longer time period also shows a relentless upward movement in the number of disasters and their human and economic impacts.[2]

It is troubling that disaster risk and impacts have been increasing during a period of global economic growth.

At best this suggests that a greater proportion of economic surplus could be better distributed to alleviate the growing risk of disaster. At worst is the possibility that development paths are themselves exacerbating the problem; increasing hazards (for example through environmental degradation and global climate change), human vulnerability (through income poverty and political marginalisation) or both.

Measuring disaster loss is itself a major conceptual and methodological challenge. On the one hand, it is necessary to define what losses can really be attributed to disasters, as opposed to other kinds of development loss. On the other hand, a major obstacle to describing and analysing disaster loss and its impact on development is the lack of reliable data and information on all levels. This is perhaps one reason why policymakers have been slow to act on the link between disaster and development.

The question of how many disasters occur and the losses that they represent can only be answered in relation to a given level of observation and resolution. Disaster losses occur on all levels, from individual household losses associated with everyday environmental hazards to losses due to exceptional catastrophic events, such as major earthquakes and cyclones that can affect entire regions. Seen from a local perspective, all these losses would be relevant and important. From a global perspective, most local level disasters are effectively invisible.

Global databases of disaster loss are maintained by reinsurance companies, such as Munich Reinsurance Group and Swiss Reinsurance as well as by the Centre for Research on the Epidemiology of Disasters (CRED), an independent academic institution. Only the latter is in the public domain and therefore accessible for analytical purposes. EM-DAT: The OFDA/CRED International Disaster Database, or EM-DAT as it will be referred to in this Report, reports losses associated with large scale and many medium-scale disaster events, but does not include losses associated with small-scale events or those medium-scale events not reported internationally.

While data on human mortality is relatively robust, data on economic loss and livelihood erosion is generally not considered to be complete or reliable at this stage. While the reinsurance companies give more emphasis to economic loss, given their focus on insured losses, this is unlikely to provide a clear picture of livelihood losses, particularly in developing countries.

Comprehensive economic assessments of disaster loss have been carried out by the Economic Commission for Latin America and the Caribbean (ECLAC), the World Bank and other regional and international bodies following major natural disasters. Such assessments, nonetheless, constitute snapshots in time and do not capture accumulative economic loss at either the national or global levels. At the same time, there is likely an underestimation of the impact of disaster on livelihood sustainability and the erosive pressure disasters can exert on social capital. In particular, the contribution to livelihood failure, household collapse and poverty of slow-onset and small-scale disasters is likely to have been played down through lack of data.

Detailed national databases of disaster loss are available in some countries, but do not provide complete global or even regional coverage at this stage. At the same time, national databases show similar deficiencies as the global databases regarding the reporting of economic loss and livelihood erosion.

BOX 1.1 THE ECONOMIC IMPACT OF DISASTERS

Disaster losses are conventionally categorised as:

- **Direct costs** — physical damage, including that to productive capital and stocks (industrial plants, standing crops, inventories, etc.), economic infrastructure (roads, electricity supplies, etc.) and social infrastructure (homes, schools, etc.).
- **Indirect costs** — downstream disruption to the flow of goods and services — e.g., lower output from damaged or destroyed assets and infrastructure and the loss of earnings as income-generating opportunities are disrupted. Disruption of the provision of basic services, such as telecommunications or water supply, for instance, can have far-reaching implications. Indirect costs also include the costs of both medical expenses and lost productivity arising from the increased incidence of disease, injury and death. However, gross indirect costs are also partly offset by the positive downstream effects of the rehabilitation and reconstruction efforts, such as increased activity in the construction industry.
- **Secondary effects** — short- and long-term impacts of a disaster on the overall economy and socio-economic conditions — e.g. fiscal and monetary performance, levels of household and national indebtedness, the distribution of income and scale and incidence of poverty, the effects of relocating or restructuring elements of the economy or workforce.

Reported data on the cost of disasters relate predominantly to direct costs. Figures on the true cost of indirect and secondary impacts may not be available for several years after a disaster event, if at all. The passage of time is necessary to reveal the actual pace of recovery and precise nature of indirect and secondary effects.

Ongoing research suggests that the secondary effects of disasters can have significant impacts on long-term human and economic development.[3] Most obviously, disasters affect the pace and nature of capital accumulation. The possibility of future disasters can also be a disincentive for investors. In examining the longer-term impact of disasters, it is also important to recognise that a disaster is not a one time event but, rather, one of a series of successive events, with a gradual cumulative impact on long-term development.

Source: Benson (2002)[4]

1.3.1 Economic loss as an indicator of disaster impact

Economic losses are often reported with reference to only the direct losses from infrastructure and assets destroyed during large-scale disasters. They seldom take into account the economic implications of reduced levels of production linked to damage in productive assets or infrastructure that in turn limit access to raw materials, energy, labour or markets (see Box 1.1 on previous page).

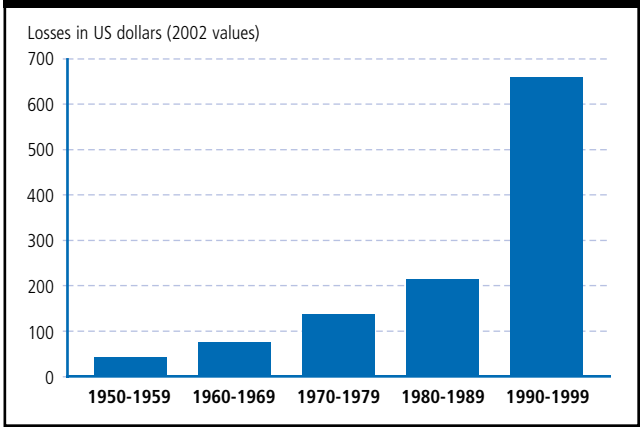
In absolute terms, the recorded economic cost of disasters has been increasing over decades (see Figure 1.1). According to Munich Re, real annual economic losses in 2002 averaged US$ 75.5 billion in the 1960s, US$ 138.4 billion in the 1970s, US$ 213.9 billion in the 1980s and US$ 659.9 billion in the 1990s.[5]

Munich Re estimates that global economic losses for the most recent ten years (1992-2002) were 7.3 times greater than the 1960s. The *World Disasters Report 2002* assesses the annual average estimated damage due to natural disasters at US$ 69 billion. Two-thirds of these losses were reported from high human development countries.

Figure 1.2 shows economic loss by World Region for disaster events triggered by a natural hazard between 1991 and 2000. The unequal distribution of impacts is clear. In Europe and America, losses are shown to be higher than in Africa, but this is a reflection on the value of infrastructure and assets at risk, not impact on development potential. In less developed regions of the world, low losses reflect a deficit of infrastructure and economic assets rather than a low impact on development. And even a small economic loss may be critically important in the case of countries with a very low GDP. What economic loss data cannot show is the variable capacity of people and businesses from different regions to protect themselves from economic loss, for example, through insurance or government aid. Africa's much smaller economic losses may be more significant in terms of slowing progress in human development.

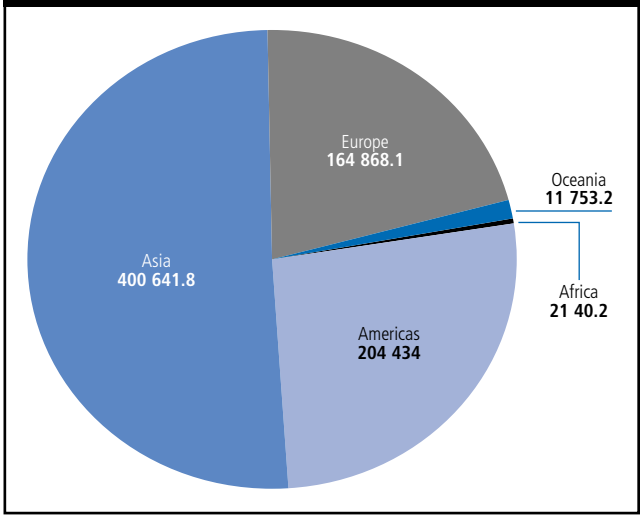
The use of economic loss as an indicator of disaster impact on development varies for different natural hazards. For example, earthquakes often appear to trigger the most expensive disasters, but losses are concentrated. Individual floods may not record large losses, but total human impact may be higher. Asian countries experience the greatest collective economic losses to disaster, with flood being a common hazard in this region and human development may be even more at risk here than these data suggest.

FIGURE 1.1 ECONOMIC LOSSES DUE TO NATURAL DISASTERS FROM 1950 TO 2000



Source: Munich Re

FIGURE 1.2 TOTAL AMOUNT OF DISASTER DAMAGE BETWEEN 1991 AND 2000 IN MILLIONS OF US DOLLARS (2000 VALUES)



Source: EM-DAT: The OFDA/CRED International Disaster Database

1.3.2 Human loss as an indicator of disaster impact

In the last two decades, more than one and a half million people have been killed by natural disasters. The total number of people affected each year has doubled over the last decade.

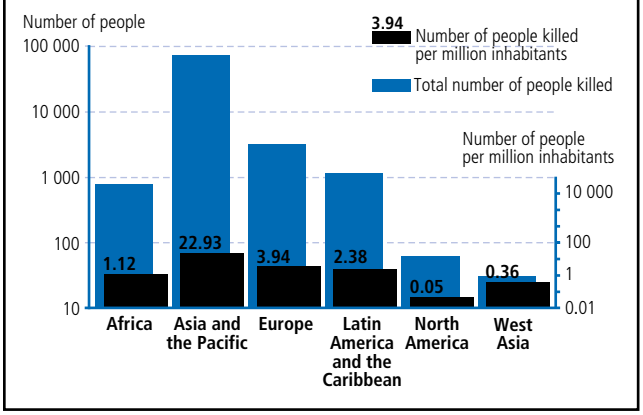
Human deaths are the most reliable measure of human loss and are the indicator used in this Report. However, as with economic data, this reveals only the tip of the iceberg in terms of development losses and human suffering. Worldwide, for every person killed,

around 3,000 people are exposed to natural hazards.[6] This scale of impact fits more intuitively with the order of magnitude one might expect from disaster. But even here the ways in which people are identified as being affected is partial. Estimates are based on assessments of the number of people experiencing damage to livelihoods or to a dwelling, or interruption of basic services. But these are difficult data to collect in a post-disaster period, particularly if there is not an accurate pre-disaster baseline. More difficult still is factoring in longer term impacts, such as the consequences of the death or incapacitation of a primary income earner on a household or extended family, the consequences of migration or resettlement, or the number of people experiencing secondary health and educational impacts.

Data from EM-DAT[7] reveals that in examining human deaths to disasters with a natural trigger by world region (Figures 1.3 – 1.6), a common thread is seen across hazard types. The Asia-Pacific region experiences the greatest impacts both in terms of total lives lost and when lives lost are calculated as a proportion of regional population, due to earthquakes, tropical cyclones and floods. The exception to this comes from the high concentration of deaths associated with drought in Africa. Drought events are often part of a bigger picture that can include armed conflict, extremes of poverty and epidemic disease with death touching only the surface of livelihood disruption and human suffering. The erosion of development gains under such circumstances are clear.

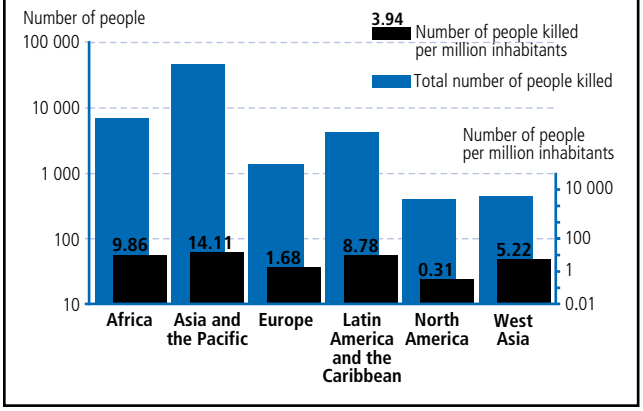
The concept that humanitarian emergencies associated with drought can only be fully understood by considering the role played by armed conflict, extreme poverty and epidemic disease is a useful entry point for rethinking the disaster-development relationship. If disasters apparently triggered by drought are often more

FIGURE 1.3 TOTAL REGIONAL MORTALITY, EARTHQUAKES, 1990–1999



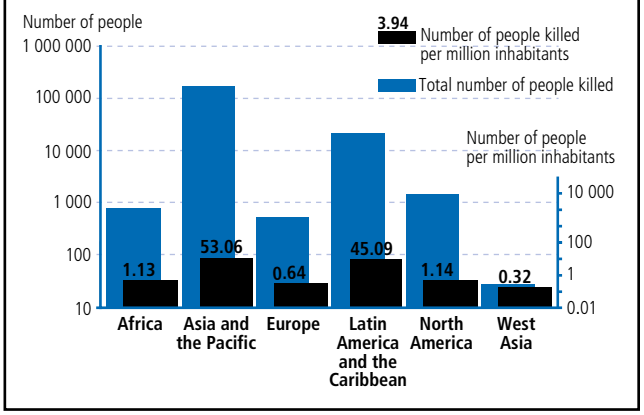
Source: EM-DAT: The OFDA/CRED International Disaster Database

FIGURE 1.4 TOTAL REGIONAL MORTALITY, FLOODS, 1990–1999



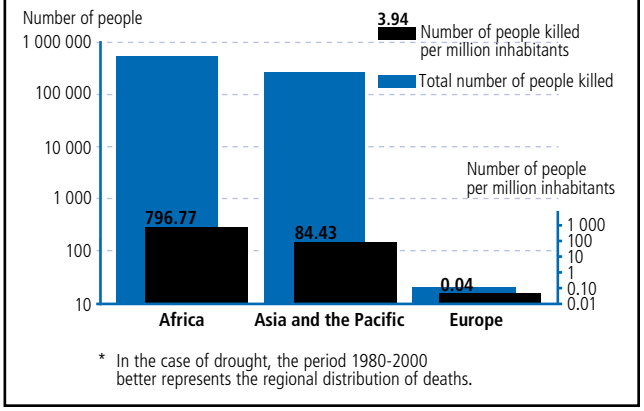
Source: EM-DAT: The OFDA/CRED International Disaster Database

FIGURE 1.5 TOTAL REGIONAL MORTALITY, TROPICAL CYCLONES, 1990–1999



Source: EM-DAT: The OFDA/CRED International Disaster Database

FIGURE 1.6 TOTAL REGIONAL MORTALITY, DROUGHTS, 1980–2000*



* In the case of drought, the period 1980-2000 better represents the regional distribution of deaths.

Source: EM-DAT: The OFDA/CRED International Disaster Database

properly thought of as complex emergencies, as much to do with human as environmental processes, why not other disasters associated with tropical cyclones, earthquakes or floods?

Regional losses in Latin America and the Caribbean are dominated by disasters triggered by tropical cyclones and flooding. Africa and West Asia also suffer from high losses from flooding. Europe and North America show lower absolute and relative numbers of deaths to all hazard types, with the highest impact for these regions being registered by Europe's relative losses to earthquakes.

The severe famines associated with drought that unfolded in sub-Saharan Africa in the 1980s are shown by extending drought losses to a time period of 1980-2000.

1.4 Disaster Risk and the Millennium Development Goals: A Framework for Action

A considerable incentive for rethinking disaster risk as an integral part of the development process comes from the aim of achieving the goals laid out in the Millennium Declaration. The Declaration sets forth a road map for human development supported by 191 nations. Eight Millennium Development Goals were agreed upon in 2000, which in turn have been broken down into 18 targets with 48 indicators for progress. Most goals are set for achievement by 2015.[8]

The MDGs contain cross-cutting themes in development and disaster risk policy, each tied to specific targets and indicators for progress. They require international collaboration to be met. All signatory countries now claim to be working toward these goals and donors are providing sharply focused aid packages to support their endeavours.

The risk to development stemming from natural disaster is recognised in the Millennium Declaration in Section IV, entitled "Protecting Our Common Future". Within this section is stated the objective: "to intensify our collective efforts to reduce the number and effects of natural and man-made disasters".[9]

Natural disasters occur when societies or communities are exposed to potentially hazardous events, such as extremes of rainfall, temperature or wind speed or tectonic movements, and when people are unable to absorb the impact or recover from the hazardous impact. While it is commonplace to talk about natural disasters, both vulnerability and hazard are conditioned by human activities. Reducing the number and effects of natural disasters means tackling the development challenges that lead to the accumulation of hazard and human vulnerability that prefigure disaster.

The accumulation of disaster risk and the unequal distribution of disaster impacts prompt a questioning of the development paths that have been taken by countries more or less at risk from disaster. Natural disasters destroy development gains, but development processes themselves play a role in driving disaster risk. To follow the example quoted earlier, when a school built without earthquake resistance collapses during a tremor, is this an example of disaster risk undoing development, or of inappropriate development prefiguring disaster risk?

The MDGs direct development planning towards priority goals. Each of these goals will interact with disaster risk. On the surface, these goals will contribute to a reduction of human vulnerability to natural hazard. But it is the processes undertaken in meeting each goal that will determine the extent to which disaster risk is reduced. Building schools is not enough for a sustainable and long-term development gain, schools exposed to natural hazard must be disaster resistant, and people using them need to prepare for disaster.

This implies a two-way relationship between the kind of development planning that can lead to the achievement of the MDGs and the development processes that are currently associated with an accumulation of disaster risk. Unless disaster risk considerations are factored into all development related to the MDGs, well-meaning efforts to increase social and economic development might inadvertently increase disaster risk. At the same time, the realisation of existing (let alone future) levels of risk will slow down and undermine efforts to achieve the MDGs.

The primary responsibility for achieving MDGs lies with individual countries. To date, 29 countries have published Millennium Development Goal Reports.[10]

BOX 1.2 THE MILLENNIUM DEVELOPMENT GOALS AND DISASTER RISK REDUCTION

The Millennium Declaration contains a statement of values and objectives for the international agenda for the XXI century. Eight Millennium Development Goals, based on the Millennium Declaration, have been approved by the General Assembly as part of a road map for the implementation of the Declaration. These are set out below and each one's relationship with disaster risk is highlighted.

1. Eradicating extreme poverty and hunger

i) To halve the proportion of people whose income is less than one dollar a day
ii) To halve the number of people who suffer from hunger

The DRI proves through statistical analysis a long-held theoretical position that human vulnerability to natural hazards and income poverty are largely co-dependent. At the national level, reducing disaster risk is often contingent upon alleviating poverty and vice versa. Exposure to hazards can play a critical role in places where poverty expresses itself as a lack of entitlement to acquire basic nutritional needs. Hunger reduces individual capacity to cope with disaster stress and shock and disasters can destroy assets leading to hunger. The economic and political underpinnings of hunger, particularly within complex political emergencies, are well documented.[11]

2. Achieving universal primary education

i) To ensure that children everywhere — boys and girls alike — complete a full course of primary education

Educational attainment is a fundamental determinant of human vulnerability and marginalisation. Basic literacy and numeric skills enable individuals to become more engaged in their society. Broadening participation in development decision-making is a central tenet of disaster risk reduction.

The destruction of schools is one very direct way in which disasters can inhibit educational attainment, but perhaps more important is the drain on household resources that slow and sudden-onset disasters inflict. Households frequently have to make difficult decisions on expending resources on survival and coping with poverty, or on investments (such as education and health care) to alleviate human vulnerability and enhance longer-term development prospects. Unfortunately, for the poorest, there is no choice and human vulnerability deepens as resources are targeted towards survival.

3. Promoting gender equality and empowering women

i) Eliminate gender disparities in primary and secondary education, preferably by 2005, and in all levels by 2015.

Facilitating the participation of women and girls in the development process, including efforts to reduce disaster risk, is a key priority. Women across the world play critical roles in the shaping of risks in development. In some contexts, women may be more exposed to and vulnerable to hazards. For example, those with responsibilities in the household may be more exposed to risk due to unsafe building and from local hazards stemming from inadequate basic services or exposure to smoke from cooking fuel. At the same time, women are often more likely than men to participate in communal actions to reduce risk and enhance development. Orienting disaster risk policy so that it builds on the social capital represented by women can enable a more informed development policy. As criticisms of participatory development indicate, achieving such a model will not be easy, but best practice does exist to point the way.

When women face barriers in participating at higher levels of decision-making, this severely limits the skills and knowledge available for sustainable development and risk reduction. Overcoming disparities in access to education is a fundamental component of the disaster risk reduction agenda.

4. Reducing child mortality

i) Reduce infant and under-five mortality rates by two-thirds

Children under five years of age are particularly vulnerable to the impacts of environmental hazards ranging from the everyday risks of inadequate sanitation and drinking water to death and injury following catastrophic events and their aftermath. The loss of care givers and household income earners and the stress of displacement can have especially heavy tolls on the psychological and physical health of children under five years of age. Policies aiming to support sustainable development paths by reducing child mortality need to build in strategies to limit or reduce disaster risk.

5. Improving maternal health

i) Reduce maternal mortality ratios by three-quarters

As environmental hazard stress or shock erodes the savings and capacities of households and families, marginal people within these social groups are most at risk. In many cases it is women and girls or the aged who have least entitlement to household or family assets. Maternal health is a strategic indicator of intra- and inter-household equality. Reducing drains on household assets through risk reduction will contribute to enhancing maternal health. More direct measures through investment in education and health will similarly contribute to household resilience as maternal health indicators improve. Children have already been identified as a high-risk group and maternal health plays a part in shaping the care received by young children.

6. Combating HIV/AIDS, malaria and other diseases

i) Halt and begin to reverse the spread of HIV/AIDS
ii) Halt and begin to reverse the incidence of malaria and other major diseases

The interactions between epidemiological status and human vulnerability to subsequent stresses and shocks are well documented. For example, rural populations affected by HIV/AIDS are less able to cope with the stress of drought because of a shortage of labour. Individuals living with chronic terminal diseases are more susceptible to the physiological stress of hunger. For diseases transmitted through vectors, there is a risk of epidemic following floods or drought, similarly the destruction of drinking water, sanitation and health care infrastructure in catastrophic events can increase the risk of disease.

7. Ensuring environmental sustainability

i) Integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources
ii) Halve the proportion of people without sustainable safe drinking water
iii) By 2020, achieve a significant improvement in the lives of at least 100 million slum dwellers

Major disasters, or the accumulation of risk from regular and persistent but smaller events, can wipe out any hope of sustainable urban or rural environments. Again, the equation works both ways. Increasing destruction due to landslides, floods and other disasters related to environmental and land-use patterns are a clear signal that massive challenges remain in achieving this MDG. The target of achieving a significant improvement in the lives of at least 100 million slum dwellers by the year 2020 will be impossible without developing policies to confront their currently high risk from earthquake, tropical cyclones, flooding and drought.

8. Developing a global partnership for development

i) Address the least developed countries' special needs and the special needs of landlocked and small island developing states
ii) Deal comprehensively with developing countries' debt problems
iii) Develop decent and productive work for youth
iv) In cooperation with pharmaceutical companies, provide access to affordable essential drugs in developing countries
v) In cooperation with the private sector, make available the benefits of new technologies — especially information and communications technologies

Efforts to enhance sustainable development and reduce human vulnerability to natural hazard are hampered by national debt burdens, terms of international trade, the high price of key drugs, lack of access to new technology and new hazards associated with global climate change.

Difficulties in reaching international agreement on a range of issues, for example at the World Summit on Sustainable Development in Johannesburg in 2002 and the World Trade Organisation meeting at Cancun in 2003, highlight the efforts needed to build a global partnership for development that might contribute to disaster risk reduction.

Examples of progress at the international level include cooperation between states at high risk from natural disaster that has increased their negotiating power. In the case of small island developing states, the Association of Small Island States has been active in climate change talks. Within the machinery of international organisations, the ISDR Task-Force constitutes a good example of global partnership for development and disaster risk reduction.

Source: www.un.org/millenniumgoals

While the MDGs have galvanised international development efforts, progress has been slow and this has direct implications for global levels of disaster risk.[12] The most far-reaching opportunities for disaster risk reduction within the MDGs relate to MDG8 — developing a global partnership for development. This requires that developed countries meet their commitments to trade reform, debt relief and aid. The lack of consensus on international trade, particularly in agriculture that brought the World Trade Organization talks in Cancun in 2003 to a halt, shows the amount of work that still needs to be undertaken in building an international agenda for trade reform. Without such reform, developing countries will have little chance of generating higher economic growth. At the same time, however, because trade reform has such far-reaching implications for patterns of economic, social and territorial development, by definition it will change the distribution of disaster risk. Once again, the two-way relationship between disaster risk and development becomes apparent. Trade reform may stimulate more *risk generating* development, unless disaster risk reduction becomes an integral part of development planning.

Issues of environmental sustainability were discussed in the World Summit on Sustainable Development, held in Johannesburg, South Africa in 2002. The Johannesburg Plan of Implementation encourages public-private sector partnerships in managing environment and development challenges. The ways in which partnerships operate in terms of wealth generation and distribution, stakeholder participation and the environmental impacts of development, will also potentially contribute to the shaping of disaster risk. These need to be critically reviewed in the face of disaster risk, stemming from the ongoing degradation of the natural environment from deforestation, natural resource extraction (including oil), soil loss, biodiversity loss and growing concerns for access to water for drinking and agricultural use.

Alongside the use of the MDGs in focusing development aims, the international community is also changing its way of delivering development support. This too has implications for the shaping of disaster risk and the way in which strategies for enhancing security will need to be framed.[13] In particular, the use of national Poverty Reduction Strategy Papers (PRSPs) to better define priorities for public expenditure and the role of aid within these priorities. This rethinking of aid applies not only to governments, but also to civil society and the private sector.

With disaster risk increasingly recognised as one way in which economic poverty is felt or expressed,[14] PRSPs need to take this into account. They also provide an opportunity to bridge the ministerial and bureaucratic divides that have in the past so often resulted in disaster risk reduction falling in the cracks between development planning and disaster response.

1.5 A Changing Debate: Bringing Disasters and Development Together

A developmentally informed perspective on disasters lies at the intersection of work normally undertaken by two different communities: development planners and disaster risk reduction practitioners. This Report hopes to contribute by catalysing both communities to rethink their responsibilities. It follows previous initiatives that have paved the way for this argument. Important in this regard has been the United Nations International Decade for Natural Disaster Reduction, 1990-1999 (IDNDR).

A number of very large-scale disasters occurred at the end of the IDNDR. The 1997-1998 El Niño led to flooding in East Africa, Latin America, the Caribbean and South and Southeast Asia. It was followed by hurricanes Georges and Mitch hitting Central America and the Caribbean. These events were succeeded by mudslides and debris flows in Venezuela, a cyclone in Orissa, India, and earthquakes in Turkey, El Salvador and Gujarat, India. All this occurred in the four years between 1997 and 2001 and all contributed to a more articulated and serious consideration of the disaster-development relationship.[15]

The declaration of the IDNDR helped raise the profile of discussions surrounding the social and economic causes of disaster risk. In acknowledging this came the realisation that mitigating losses through technological and engineering solutions dealt with the symptoms rather than with the causes of the problem and that reducing disaster risk required a long-term engagement with processes of international development. The major disasters occurring at the end of the 1990s helped to galvanise support for this view.

As the successor to IDNDR in 2000, the UN International Strategy for Disaster Reduction (ISDR) was initiated to foster this agenda by focussing on the processes involved in the awareness, assessment and management of disaster risks. An important tool in the development of this agenda has been the ISDR Secretariat's publication *Living with Risk: A Global Review of Disaster Reduction Initiatives.*[16] The UN commitment to promoting sustainable development and mitigating disaster losses is brought together in this document.

BOX 1.3 THE EVOLUTION OF NATURAL DISASTER AS A DEVELOPMENT CONCERN

Both researchers and practitioners have been providing compelling evidence for many years that natural disasters are something more than just *acts of God.* While this is a broad generalisation of a very complex and heterogeneous process, one can say that until the 1970s a dominant view prevailed that natural disasters were synonymous with natural events such as earthquakes, volcanic eruptions and cyclones. In other words, an earthquake was a disaster *per se.* The magnitude of a disaster was considered to be a function of the magnitude of the hazard. As earthquakes and volcanic eruptions are not avoidable, the emphasis of national governments and the international community was on responding to the events and in the best of cases, preparing for them.

From the 1970s onwards, technical professionals, such as engineers and architects, began to focus on the fact that the same natural hazard had a varying impact on different kinds of structures, such as buildings. The characteristics of a disaster became more associated with its physical impact than with the natural hazard. Interest grew in the design and implementation of ways to mitigate losses through physical and structural measures to reduce hazards (for example, through building levees and flood defences) or to increase the resistance of structures. Unfortunately, the cost of physical mitigation meant that in many countries efforts to reduce risks by these means have been minimal.

Also since the 1970s, but with increasing emphasis in the 1980s and 1990s, researchers from the social sciences and humanities have argued that the impact of a natural hazard depends not only on the physical resistance of a structure, but on the capacity of people to absorb the impact and recover from loss or damage. The focus of attention moved to social and economic vulnerability, with mounting evidence that natural hazards had widely varying impacts on different social groups and on different countries. The causal factors of disaster thus shifted from the natural event towards the development processes that generated different levels of vulnerability. Vulnerability reduction began to be advanced as a key strategy for reducing disaster impact, though this proved elusive to implement.

By the end of the 1990s, it was clear that development processes were not only generating different patterns of vulnerability, but were also altering and magnifying patterns of hazard — an argument that has gained increasing currency as evidence mounts regarding the impact of global climate change. Risk management and reduction has been advanced as an integral paradigm that builds on and incorporates all the previous strategies from the perspective that all development activities have the potential to increase or reduce risks.

In 1997, under the United Nations Programme for Reform, the General Assembly transferred the responsibility for operational activities on natural disaster mitigation, prevention and preparedness to UNDP. Since then, UNDP has made considerable progress in developing capacity building programmes in disaster reduction and recovery. In doing this, UNDP supports the implementation of the ISDR agenda at the national and regional levels. This work is reinforced by partnerships with the Office for Co-ordination of Humanitarian Affairs (OCHA) and other UN agencies and international organisations.

International Financial Institutions (IFIs) such as the World Bank and the regional development banks have also began to engage with issues surrounding the relationship between disaster risk and economic development. Many considerations compelled IFIs to incorporate disaster reduction as a major part of their portfolio of activities. For example, the massive destruction of infrastructure that had been built with international loans from the IFIs, the setbacks to national economies and the mounting evidence that unless disaster reduction was factored into reconstruction, new loans following disasters might simply lead to the *rebuilding* of risk. The ProVention Consortium, launched by the World Bank as a global partnership of governments, international organisations, academic institutions, the private sector and civil society, has been active in promoting research and disseminating best practices in many aspects of disaster risk management.

Members of international civil society also have been instrumental in moving the agenda of managing disasters on from mitigation and preparedness, towards a deeper integration with development processes. Since 1992, IFRC has published an annual *World Disaster Report.*[17] The two most recent editions focused on disaster risk reduction and recovery. This new focus on the links between disaster and development shows the increasing awareness in major international development and humanitarian agencies about the importance of disaster risk reduction. As with *Reducing Disaster Risk: A Challenge for Development,* the IFRC argument for a greater emphasis on disaster risk reduction building on established response mechanisms, is tied into the context of achieving the Millennium Development Goals.[18]

At the same time in recognising the growing international interest and commitment to reducing disaster risk, it is

important to recognise that this has been stimulated by the emergence of national and regional institutions dedicated to research, training and application in disaster prone countries. Many of the contemporary approaches to risk management and reduction, now being discussed and advocated at the international level, have grown out of disaster reduction research and application by developing country researchers and institutions. Since the early 1990s, a growing literature has emerged in Latin America and the Caribbean, Asia and Africa.[19]

The creation of regional organisations and networks manifests the growing maturity of this process. These organisations and networks now have an important influence on international policy.

1.6 Is Sustainable Human Development Achievable Under Natural Disaster Risk?

The UNDP emphasis on human development has informed the way in which development is conceived of in this Report. Human development is about more than the rise or fall of national incomes. It is about having space in which people can develop their full potential and lead productive, creative lives in accordance with their needs and interests. People are the real wealth of nations.

Fundamental to human development is building human capabilities: the range of things that people can do or be in life. The most basic capabilities for human development are to lead long and healthy lives, to be knowledgeable, to have access to the resources needed for a decent standard of living and to be able to participate in the life of the community. Without these, many choices are simply not available and many opportunities in life remain inaccessible. The stress and shock felt by those vulnerable and exposed to natural hazards will impact in myriad ways on the capacity of people to achieve and enjoy human development gains. Levels of human development will also shape people's capacity to be resilient in the face of hazard stress and shock.

UNDP Human Development Reports (HDR) recognise the role played by disaster risk in shaping human development. Disaster risk has been a concern of regional thematic works including: *El Estado de la Region* published in 1999 and covering Central America, *Building Competitiveness in the Face of Vulnerability*, published in 2002 by the Organisation of Eastern Caribbean Sates, and *El Impacto de un Huracán*, published in 1999 in Honduras. More generally, given the close relationship between disaster risk and human development, the HDR series often discusses concerns relevant to disaster risk reduction though in a less systematic manner.[21]

BOX 1.4 MAHBUB UL HAQ ON THE MEANING OF HUMAN DEVELOPMENT

The basic purpose of development is to enlarge people's choices. In principle, these choices can be infinite and can change over time. People often value achievements that do not show up at all, or not immediately, in income or growth figures: greater access to knowledge, better nutrition and health services, more secure livelihoods, security against crime and physical violence, satisfying leisure hours, political and cultural freedoms and a sense of participation in community activities. The objective of development is to create an enabling environment for people to enjoy long, healthy and creative lives.

Source: Mahbub ul Haq [20]

1.6.1 Disaster-development linkages

The primary focus of *Reducing Disaster Risk: A Challenge for Development* is on the relationship between human development and disaster.[22] In order to clarify the ways in which disaster and development interact, it is helpful to distinguish between the economic and social elements of human development. These components are interdependent and overlapping. Nevertheless, it is useful to think of the ways that these two elements, and their constituent institutional and political components, are shaped, retarded and sometimes accelerated by disaster. Similarly, one can analyse the ways in which economic and social

BOX 1.5 DISASTER RISK, HUMAN DEVELOPMENT AND THE MDGs

The interaction of **economic development** with disaster risk has direct consequences for the meeting of MDG 1 (eradicate extreme poverty and hunger), 6 (combat HIV/AIDS, malaria and other diseases) and 7 (ensure environmental sustainability).

The interaction of **social development** and disaster risk has direct consequences for the meeting of MDG 3 (promote gender equality and empower women) and 8 (develop a global partnership for development).

TABLE 1.1 DISASTER-DEVELOPMENT

	Economic Development	Social Development
Disaster limits development	Destruction of fixed assets. Loss of production capacity, market access or material inputs. Damage to transport, communications or energy infrastructure. Erosion of livelihoods, savings and physical capital.	Destruction of health or education infrastructure and personnel. Death, disablement or migration of key social actors leading to an erosion of social capital.
Development causes disaster risk	Unsustainable development practices that create wealth for some at the expense of unsafe working or living conditions for others or degrade the environment.	Development paths generating cultural norms that promote social isolation or political exclusion.
Development reduces disaster risk	Access to adequate drinking water, food, waste management and a secure dwelling increases people's resiliency. Trade and technology can reduce poverty. Investing in financial mechanisms and social security can cushion against vulnerability.	Building community cohesion, recognising excluded individuals or social groups (such as women), and providing opportunities for greater involvement in decision-making, enhanced educational and health capacity increases resiliency.

development (and their constituent processes) work directly or indirectly to decrease or increase disaster risk.

Table 1.1 sets out these complex interactions schematically, which are discussed below and form the context for the following chapters. Social development includes social assets such as inclusive governance, but also the health and educational infrastructure that enables participation. Economic development concerns economic production and its supporting infrastructure, for example transport networks to enable market access and the integrity of natural resources for the sustainability of resource-dependent livelihoods.

Disasters limit economic development?

Disasters can wipe out the gains of economic development. In 1982, Hurricane Isaac destroyed 22 percent of the housing stock in the Tongan archipelago.[23] Reconstruction costs to correct damage to water, sanitation, energy, telecommunication, roads and railway infrastructure from flooding in Mozambique in 2000 will cost US$ 165.3 million.[24] These accounts are dramatic, but the constant drain on resources from everyday disasters similarly limits the development potential of millions of people around the world. In Viet Nam, in "normal" years, flooding destroys an average of 300,000 tonnes of food.[25]

Catastrophic disasters result in the destruction of fixed assets and physical capital, interruption of production and trade, diversion and depletion of savings and public and private investment. While absolute levels of economic loss are greater in developed countries due to the far higher density and cost of infrastructure and production levels, less-developed countries suffer higher levels of relative loss when seen as a proportion of Gross Domestic Product (GDP).

The 2001 earthquakes in El Salvador and Seattle in the United States resulted in losses of around US$ 2 billion each. While this scale of loss was easily absorbed by the U.S. economy, it represented 15 percent of El Salvador's GDP for that year.

Larger countries, with a greater geographical spread of economic assets relative to the spatial impact of disasters, are more able to avoid direct loss and minimise downstream, indirect or secondary losses. In 1995, Hurricane Luis caused US$ 330 million in direct damages to Antigua, equivalent to 66 percent of GDP. This can be contrasted with the larger economy of Turkey that lost between US$ 9 billion and US$ 13 billion in direct impacts from the Marmara earthquake in 1999, but whose national economy remained largely on track.[26]

Not only the size of a nation's economy, but also the proportion of its land area exposed to hazard will determine disaster risk. This partly accounts for the high vulnerability of small island developing states. Almost three-quarters of the island of Montserrat was made uninhabitable by a volcanic eruption in 2001. Today only 36 percent of the pre-disaster population remain, supported by the United Kingdom.

A lack of diversity in the economy can also undermine security, whether it be of a household or nation. The importance of diversification for rural livelihood

sustainability has long been recognised as a mechanism to cope with changing market conditions and climatic fluctuations. There is a tension here between the dictates of global trade, which pushes countries towards specialisation, and the insecurity that a lack of diversity brings. This is particularly so for countries "specialising" in primary commodity exports that may also be at risk from drought, flooding or tropical cyclones. This is exemplified by reduced agricultural production in Africa in the 1997 El Niño year. The most significant declines were in Botswana, Lesotho, Malawi, South Africa, Swaziland and Zambia.[27]

But the relationship between economic size, diversity and risk is not simple. The lowest income countries are not necessarily the most vulnerable from an economic perspective. This group, including Burkina Faso, Ethiopia, Malawi and Swaziland, typically have agrarian economies. Although vulnerable to drought, once rains return recovery can be fast and attracts high levels of donor support. A study of drought impacts showed that intermediate economies with some diversification (such as Senegal and Zimbabwe) have been more vulnerable as economic impacts cross into manufacturing sectors. Impacts also linger, as recovery of the manufacturing sector is slower than in agriculture and may not attract so much donor attention.[28]

At the local level, disasters can seriously impact household livelihoods and push already vulnerable groups further into poverty. The loss of income earners, through death or injury, the interruption of production or access to markets and the destruction of productive assets, such as home-based workshops, are all examples of ways in which disasters affect local and household economies. Often such impacts are accumulative as the impact of everyday and frequently occurring small-scale hazards erodes livelihoods over a period of time. The capacity of a household or local community to absorb the impact and recover from a major natural hazard will be seriously limited if already weakened over time by a series of smaller-scale losses.

Disasters limit social development?

A population that has been weakened and depleted by natural disaster, particularly when this coincides with losses from HIV/AIDS, malnutrition or armed conflict, will be less likely to have the organisational capacity to maintain irrigation works, bunds in fields for water harvesting, hillslope terraces, community wood lots or shelter belts. Without these social assets, communities become more vulnerable.

In addition to the loss of social assets themselves, there are many examples of disaster events destroying the gains of the health, sanitation, drinking water, housing and education sectors that underpin social development. Examples include the El Salvador earthquake in 2001, which badly damaged 23 hospitals, 121 health care units and 1,566 schools; or the cyclone that hit Orissa, India in 1999, which led to the contamination of drinking water wells and damaged many schools in the direct impacts of a single event.[29]

Potentially negative consequences for social development do not stop with direct impacts. In the aftermath of a disaster or during the escalation of a slow-onset disaster, such as a drought or complex political emergency, problems with governance mean that aid budgets can be skewed towards the recovery of one group or sector as opposed to another. The result is a reduction in social equality.

A review of livelihoods and governance conditions that led to high losses in the Orissa cyclone in 1999 has pointed to corruption at all levels, unnecessary bureaucracy, political rivalry and an apathetic civil society as pressures that contributed to vulnerability.[30]

Disaster response may also be a time when democratic institutions come under pressure. After the 1985 earthquake in Chile, a traditional civilian response threatened to undermine a dictatorial government.[31] The response was demobilised through repression and the state took over.

Women suffer additional stresses in disaster situations and also bear a disproportionate burden of the additional domestic and income-generating work necessary for survival following a disaster event. When women are exposed to these additional stresses, the level of social development is reduced. However, over the long run, it is also possible that the net result is an increase in their economic and political participation — generating an increase in social development.

The exclusion of women from local decision-making circles in Bangladesh led to women and girls being unwilling to use hurricane shelters. Current, inclusive decision-making bodies have improved the social

position of women and the management of hurricane shelters has been reformed — encouraging greater use among women.

Economic development increases disaster risk?

There are many examples of the drive for economic growth generating disaster risk. This is as true for individuals as it is for international business. The massive forest fires in Indonesia in 1997 that caused air pollution in neighbouring Malaysia were partly caused by the uncontrolled use of fire by farmers wishing to expand production of a major export crop, palm oil. Tourist developments that fringe Barbados may inadvertently be adding to their own risk as waste water and recreational sports contribute to the denudation of coral reefs, which act as a first line of sea defence against storm surges.

Hurricane Mitch in 1998 generated a wide-ranging reflection on the relationships between poverty and environmental degradation. The notion of "Reconstruction with Transformation" was coined by governments in negotiations with external aid donors. In aiming to build a changed development path into the reconstruction effort, this carried with it an explicit recognition that pre-disaster development priorities had led to high levels of risk and human vulnerability, eventually culminating in a humanitarian disaster triggered by a tropical cyclone.

It is the rules of governance that promote particular development paths that also shape patterns of risk and disaster loss. In Izmit, Turkey, systemic corruption played an important role in contributing to the failure of building regulation, sub-standard construction and high rates of building failure during the 1999 earthquake.

Contemporary disaster risk can be linked to historical development decisions and to development decisions taken by actors in distant places. Disaster risks associated with global climate change, or the pollution of rivers by industrial and household effluent that increases the vulnerability of downstream rural communities, exemplify these relationships operating at different scales.[32]

The gaps of time and place between development gain and disaster risk accumulation and the ability of some people to shift their risk onto others while enjoying the benefits of development, are not fully understood and need further examination to assist policy formation. Globalisation will undoubtedly lead to new risk factors and modify or build on previously existing risk.

Economic development does not need to contribute to the conditions that undermine human and environmental sustainability and increase disaster risk. To move forward, there must be a clear understanding of the interaction of development plans with disaster risk.

Social development increases disaster risk?

It is hard to imagine that increases in social development (improved health, sanitation, education, the participation of women in society, etc.) can increase the risk of disasters. The only possible situation that would actually place social development as a causal factor in disaster risk is one where people are forced to expose themselves or others to risk in order to fulfil their (or others) needs or desires.

Rapid urbanisation is a case in point. The growth of informal settlements and inner city slums when fuelled by international migration (for example, from East Africa to Johannesburg or from Central America to cities in the United States) or internal migration from smaller urban settlements or the countryside to large cities, has led to the burgeoning of unstable living environments. These settlements are often located in ravines, on steep slopes, along flood plains or adjacent to noxious or dangerous industrial or transport infrastructure sites. Some 600 million urban dwellers in Africa, Asia, Latin America and the Caribbean live in life- and health-threatening homes and neighbourhoods as a result of poor quality housing and inadequate provision of basic needs.[33]

In many cases, individuals will be seeking opportunities not only to improve their own quality of life, but also to enhance the health and educational attainment of their children and be prepared (or forced) to accept enhanced disaster risk today, for greater prospects for their children tomorrow. However, even this example needs consideration, as it is not increases in social development *per se* that accounts for growing risk, but the unassisted efforts of the economically marginal and politically excluded to gain access to basic human needs that has forced them to accept environmental risk.

Economic development reduces disaster risk?

For economic development to proceed without increasing disaster risk, development planning needs

to reconcile three potentially conflicting drivers for development. First, the generation of wealth, which can raise the basic level of human development. Second, the distribution of wealth, which can enable even the poorest to overcome human vulnerability. Third, the externalities of wealth creation (waste, pollution, destruction of environments or human culture), which need to be controlled to prevent the loss of the fundamental assets on which human life depends and gains meaning.

The mainstreaming of disaster risk assessment into existing development instruments is critical in achieving economic development without generating new risks. This includes opportunities for building on existing risk impact assessment tools and examining opportunities for integration into activities such as housing and infrastructure development, industrial and agricultural development and the introduction of new technologies. This requires a two-pronged strategy. On the one hand, risk information can be used through instruments such as land-use planning and building regulations to increase the resistance, safety and sustainability of development interventions. On the other hand, it is necessary to evaluate the possible impacts of economic development in terms of risks in other locations and for other social groups.

The Klang River Basin Flood Mitigation and Environmental Management Project in Malaysia is a good example of development oriented towards risk reduction. The Klang River Basin is rapidly urbanising and its population is more than 3.6 million, with major portions of agricultural land being converted for urban use. Frequent flooding and degradation of the riparian environment have been escalating as urbanisation continues. An Environmental Master Plan is planned to direct environmental management. The plan aims to improve river water quality and provide flood warning and protection.[34]

Operating during the reconstruction phase of a disaster event, the Market Incentives for Mitigation aims to mobilise the resources of the World Bank and the insurance and reinsurance community and to apply the tools of commercial loss management to the design and maintenance of critical development investments. The goal is to let governments shift funding from emergency relief and reconstruction activities to more effective and sustainable disaster mitigation investment.[35]

An additional component to this agenda is to identify mechanisms for promoting the use of such tools in low- and middle-income countries experiencing rapid growth in populations-at-risk and the import of new and potentially hazardous technologies or waste.

At the local level, one possibility for building resilience comes from microfinance programmes. Microfinance has been shown to enhance development opportunities by providing individuals with access to credit. The Grameen Bank in Bangladesh has a long-standing commitment to supporting small-scale enterprise in this way. During the periodic floods that caused widespread destruction in Bangladesh in 1988 and 1998, losses were reduced amongst high-risk groups like agricultural communities by providing a mechanism for families to diversify income-earning activities across seasons.[36]

Social development reduces disaster risk?

Social development goals are key in shaping governance regimes for disaster risk management set within a developmental agenda. To reduce disaster risk, governance must be sensitive to the needs of those at risk from disaster with a natural trigger, and able to facilitate timely, equitable and strategically coherent decisions in resource mobilisation and disbursement.

The physical infrastructure underpinning social development includes health and education. Improved health and educational status help reduce vulnerability and can limit human losses in a disaster. Following the direct impact of a disaster event, a better-nourished, healthier population in which children have all been vaccinated will do much better in homes, shelters and camps set up for those displaced by disasters.

A literate and better-educated population — including girls and women — is better able to partner with experts in designing ways of protecting urban neighbourhoods and rural communities. Such an educated population also responds better to warnings and other public service announcements. The importance of extending educational opportunities to girls and women is noted in the MDGs and has been shown to improve the delivery of disaster risk reduction.

Gram Vikas, a rural development organisation, has been working in Orissa, India since 1979. In 1994, officials met resistance from women while implementing a

project designed to provide drinking water to the village of Samantrapur. The women's attitude was understandable. They had been excluded from the local decision-making process. Integrating women into local decision-making was a precursor to project success. To enable this, women were offered training in basic literacy, health care and income generation. Women are now included in maintaining water supply and toilet blocks in the village and have a greater stake in the politics of the village more generally.[37]

Social development points to the importance of social cohesion, inclusiveness and open participation in decision-making. Achieving such objectives is a major challenge in many communities at risk from disaster. Social capital is often used to refer to the type and thickness of bonds in a community. Projects that can enable people to build social capital for collective good can reduce vulnerability. Though some forms of social capital can be more ambiguous — as in clientelistic relationships — or negative — as in drug gangs.

A community's quality and quantity of social capital may change over time. The impact of disaster with a natural trigger on social capital is uncertain. Comparative work on armed conflict has identified a vicious circle where the loss of interaction between social groups inhibits the flow of information, further undermining trust and restricting future collective action. This has been identified as a weakness in reaching resolution in post-conflict societies,[38] and in building democracy and economic development more generally.[39]

The Dominican Disaster Mitigation Institute has facilitated the building of social capital in vulnerable communities in the Dominican Republic. A long-term strategy has been adopted where training sessions on leadership are interwoven with meetings on disaster preparedness. A number of communities have established women's and neighbouthood associations as a result. Community leaders have learned how to organise the community, establish a goal, and accomplish it.[40]

Can disaster risk enhance social or economic development?

The possibility of disasters having a positive outcome is not considered in Figure 1.2.

Notwithstanding this view, the recovery process can be an opportunity for building disaster risk reduction mechanisms into post-disaster development planning. Disaster-development relationships can be reconsidered and development priorities can be rethought. Importantly, it is not just local actors, but national and international actors who should be involved in these reflections.

Disruptions caused by disasters can open political space for alternative forms of social organisation. Often this is a negative experience, as with looting, but there is the possibility for more egalitarian forms of organisation to manifest. Support for such organisations is one way in which new development priorities might be carried forward beyond the immediate response period.

An example of a positive response to disaster is the Citizens' Disaster Response Network in Manila, which campaigns for greater transparency in government and grassroots participation in development decision-making. Its origin is in an ad hoc coalition of organisations that came together under the umbrella of the Support Disaster Victims Campaign after the eruption of Mount Mayon in 1984.[41]

During the disaster recovery and reconstruction periods, flows of foreign currency into a disaster-affected country from aid, debt relief, insurance, private transfers and remittances can produce an apparent improvement in national balance-of-payments, and provide the financial means for enacting new development priorities.

BOX 1.6 GOVERNANCE AND DISASTER RISK

Governance is a critical area for innovation and reform in achieving disaster risk reduction within human development. It is important to identify those governance tools that will be likely to simultaneously benefit disaster risk reduction and human development. This would include a presumption for equality in participation in decision-making across genders, religious and ethnic groups, casts and economic classes. An awareness of the need to engage with the local knowledge of at-risk individuals and groups as well as respect for scientifically informed knowledge will improve risk management and development planning efforts.

It is also important to identify governance reform that might inadvertently contribute to the generating of human vulnerability. Social networks are often in competition with one another and though this is not a bad thing in itself, when disaster or development aid is fed through and strengthens clientelistic networks this can foster corruption and inequality, further entrenching disaster risk.

The theme of governance is not followed up in Chapter 2 and the analysis of the DRI through a lack of internationally available data. However, it is returned to in discussion in Chapter 3.

However, positive macroeconomic and livelihood effects tend to be limited to a short period of reconstruction. Following Hurricane Gilbert in 1988, Jamaica experienced a boom that reduced a potential external current account deficit of US$ 253 million to only US$ 38.3 million. The two main contributors to this were reinsurance flows of US$ 413 million and foreign grant aid of US$ 104 million. But the boom was short-lived and as reinsurance and grant aid sources of finance dried up, the impact of the disaster on Jamaica's productive capacity was felt. The following year, Jamaica recorded a current account deficit of US$ 297 million.[42]

These examples show the importance of using the disaster response and recovery periods as opportunities for reflecting on the root causes of disaster, and recasting development priorities to reduce human vulnerability and natural hazard. Simply reinventing pre-disaster conditions is a wasted opportunity. This is as true for the institutions of governance as it is for physical infrastructure.

1.7 How Can Development Planning Incorporate Disaster Risk?

The frequency with which some countries experience natural disaster should certainly place disaster risk at the forefront of development planners' minds. For example, Mozambique faces a regular cycle of droughts and floods: 1976-1978 (floods), 1981-1984 (drought), 1991-1993 (drought), 1996-1998 (floods), 1999-2000 (floods).[43]

In acknowledging the importance of disaster as a development constraint, there is a danger of seeing some countries as being by their very nature more disaster prone than others. Sub-Saharan Africa is popularly associated with drought, Central America with earthquakes and the Pacific and Caribbean islands with tropical cyclones. In each case, it is not geography alone that generates disaster risk. Rather, development processes have shaped human vulnerability and hazards paving the way for disaster.

In this section, several conceptual tools are presented that help to outline the ways in which inappropriate development can lead to disaster risk.

The history of international development underlies the disaster risk of today

The roots of much disaster risk can be traced to historical development decisions.[44] Many of the world's largest cities have sprawled from sites chosen in the pre-colonial or colonial eras to cover areas exposed to earthquake, flooding and tropical cyclones. Such cities with coastal locations include Dhaka, Bangladesh; Mombassa, Kenya; and Manila, the Philippines. In Latin America, a desire to control indigenous populations or locate close to mineral resources led to a colonial preference for interior sites. Post-colonial population growth has led to a rapid expansion in populations-at-risk from earthquakes. Mexico City, Mexico and San Salvador, El Salvador are examples and the latter city remains despite being destroyed by earthquake nine times between 1575 and 1986.

Decisions taken today will configure disaster risk in the future

The influence of past development on present disaster risk underlines the significance of contemporary decision-making for the disaster risk that might be experienced by future generations. This reinforces the importance of international cooperation to manage development. For example, in the need for the international community to negotiate to mitigate global climate change, and to support the adaptation strategies of those communities and countries most adversely affected by the impacts of global climate change. The rise of sea levels is placing great strain on coastal communities and climate change enhances the difficulty of planning development. In Fiji during the 1997-1998 drought, US$ 18 million in food and water rations had to be distributed.[45]

Population movements are changing the context of disaster risk

Mass migration from rural to urban settlements has resulted in the growth of city slums, many located on unsafe land and built with environmentally inadequate construction techniques. The marginalisation of poor rural families has led to their relocation on increasingly insecure agricultural lands. Poverty levels, or the absolute number of poor and destitute persons, have increased continually with dramatic effects in terms of increases in social risk and disaster vulnerability.

Development processes modify natural hazard

Hazards are being reshaped and new hazards introduced by contemporary development trends. For example,

the conversion of mangrove coasts into intensive shrimp farming pools in many low-lying tropical coastlines in Southeast Asia and South America has increased the level of local hazard through coastal erosion and the loss of the coastal defence provided by the mangrove stands. The introduction of new technology such as chemicals into local agriculture, rising energy demands of urban centres and the international trade in hazardous waste, are all processes that have increased the complexity of hazard. Disaster risk reduction needs to be seen in the context of a wider interacting array of natural and technological hazards.

Everyday life is made up of everyday hazards

Everyday hazard can build cultures of resistance to danger. This is seen in the many coping strategies adopted by agriculturalists. But more common, particularly in rapidly growing urban settlements, is an association of everyday hazard with poverty and vulnerability. Typical everyday hazards include inadequate sanitation and drainage, health insecurity, malnutrition, unemployment and lack of stable and sufficient incomes, drug abuse and social and domestic violence. Exposure to everyday hazard in such cases can erode development potential and increase vulnerability to future hazard.

Risk accumulates before being released in a disaster

Everyday hazards and vulnerability form patterns of accumulating risk that can culminate in disaster triggered by an extreme natural hazard event. Achieving MDG 1 (to eradicate extreme poverty and hunger) and MDG 7 (to ensure environmental sustainability) will have a direct impact on reducing human vulnerability to everyday hazards and the accumulation of risk that prepares the way for disaster.

Large disasters are made up of many smaller disasters

The nested relationship between small and large disasters is called the concatenation of risk. Typically, an apparently simple, large-scale disaster will be composed of an array of smaller, contrasting hazard types. Hurricanes, for example, can trigger local floods and landslides. Building disaster risk reduction into development planning means taking into account large and small hazards.

This analysis leads one to ask some fundamental questions…

Do risk and disaster necessarily have to increase in incidence and effect in the future?

Is it possible to maintain economic growth while introducing policies to reduce disaster risk?

Is it necessary to change the overall parameters of future development models in order to reduce the possibility of future risk variables, or might significant improvements be made with more marginal changes?

This Report starts to address these issues by arguing for a reorientation in disaster reduction — to shift from an approach that focuses exclusively on reducing the impact of disasters on development towards an integrated risk management approach that *in addition* promotes forms of development that help reduce, rather than increase, disaster risk.

This does not mean that the elements of established disaster management (preparedness, emergency response, rehabilitation and reconstruction) are less important. But they should be complimented by an awareness of the role that poorly planned development can play in making momentary development gains at the expense of increased disaster risk.

Escalating human and economic costs of disaster point towards the need for policy responses that begin to identify and then tackle the root causes of risk that are embedded within contemporary development practices — as an integrated part of development policy. If lowering the base level of risk in society is possible while maintaining sustainable development goals, then investments in disaster risk reduction would reduce required expenditure on emergency and reconstruction and lessen the immeasurable human losses experienced by those that suffer disaster.

This agenda differentiates between two types of disaster risk management. **Prospective disaster risk management** should be integrated into sustainable development planning. Development programmes and projects need to be seen in the context of the disaster-development relationship and reviewed for potential future impacts on the reduction or aggravation of vulnerability and hazard. **Compensatory disaster risk management** (also termed corrective disaster risk management) stands alongside development planning and is focussed on the amelioration of existing vulnerability and reduction of natural hazard. Compensatory policy is necessary to reduce contemporary risk, but prospective policy is required for medium- to long-term disaster risk reduction.

Work is underway on developing methods for identifying the impact of individual development projects on disaster risk. The Caribbean Disaster Mitigation Project, Investing in Mitigation: Costs and Benefits,[46] has identified three opportunities to incorporate disaster mitigation in infrastructure investment decision-making. The first is to integrate the assessment of disaster risk into existing environmental impact assessment procedures. The second is to fully integrate natural hazard risk into the economic and financial analysis of investment projects. The third is to promote hazard mitigation when the insurance industry is called upon to underwrite catastrophic protection for the investment project.[47]

It is unlikely that prospective risk management will completely eliminate all vulnerability, so compensatory risk management is set to play a long-term role in managing disaster risk. However, even here there are opportunities for planning to build resilience into vulnerable groups or investments.

1.8 Final Discussion

Achieving a more sustainable development, and one that moves towards the meeting of the MDGs, will not be possible while disaster risk management is left outside of development. The challenge for integration lies in devising the tools required for policy makers to transparently justify the closer operation of disaster and development policy.

Bringing disaster risk reduction and development concerns closer together requires three steps:

- The collection of basic data on disaster risk and the development of planning tools to track the changing relationship between development policy and disaster risk levels.
- The collation and dissemination of best practice in development planning and policy that reduce disaster risk.
- The galvanising of political will to reorient both the development and disaster management sectors.

The first two steps are perhaps the most challenging. Once the human welfare gains to be made from mainstreaming disaster risk reduction within development policy are carried out, and transparent inventories of best practice are made available, advocating for policy change becomes more achievable.

For this to be done, information gaps must be filled. As we have already emphasised, there is a dearth of basic data on disaster impacts and risks at all levels from the local to the global. Problems of mapping data are made more difficult by the dynamic nature of risk. Flux in global processes, tied in particular to economic globalisation and global climate change, and changing local conditions, including rapid urbanisation, the spread of HIV/AIDS or civil conflict, mean that disaster risk is not a static condition.

In Reducing Disaster Risk: A Challenge for Development, UNDP seeks to move this agenda forward by presenting a review of state-of-the-art information on the distribution of disaster risk at the international level and an account of key development pressures and best practice in disaster risk reduction tied to development policy.

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1. ISDR 2002, *Living with Risk: A Global Review of Disaster Reduction Initiatives;* IFRC (annual) World Disaster Reports; Cannon, T., Twigg, J., Rowell J. 2003. *Social Vulnerability, Sustainable Livelihoods and Disasters,* DFID, London.
2. See annual editions of the International Federation of the Red Cross/Red Crescent *World Disasters Report* for a discussion of this trend. Original data sources from EM-DAT, University of Louvain, Belgium.
3. http://www.eclac.cl/analisis/TIN53.htm#6.
4. Benson 2002 expert contribution.
5. Source: Munich RE 2002. Topics: annual review, natural catastrophes 2002, Munich, p. 15.
6. UNDP/UNEP calculations for this Report.
7. The EM-DAT database is the only existing publicly accessible global database on disasters triggered by a natural hazard event. The strengths and weaknesses of using this database are discussed in the Technical Annex.
8. www.un.org/millenniumgoals
9. United Nations. 2000. *United Nations Millennium Declaration,* General Assembly Resolution A/RES/55/2, 18 September 2000, p. 6.
10. http://www.undp.org/mdg/countryreports.html
11. Sen, Amartya. 2000. *Development as Freedom,* New York, Random House.
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13. Here we can mention the High Indebted Countries Initiative (HIPC) promoted by the World Bank and the International Monetary Fund, and the New Partnerships for Africa's Development (NEPAD) in Africa and the integrated United Nations Development Assistance Frameworks (UNDAF) among others.
14. See the World Bank series of publications entitled *Voices of the Poor* and the *World Development Report,* 2000, p. 19.

15. Two other periods of recent history during which sea changes in thinking about disasters took place can be identified. First, a series of disasters from 1968-1973, including the Sahel famine, Biafra and Bangladesh independence wars and associated famines, 1970 Bangladesh cyclone and the 1972 Peruvian earthquake. These events first pointed out how little coordination there was among humanitarian agencies. Secondly, the wake-up call that rich countries received between Hurricane Andrew, Miami, 1992, through the floods that hit the Midwest of the United States, 1993, to earthquakes at Northridge, CA., United States, 1994. and Kobe, Japan, 1995.
16. *Living with Risk: A Global Review of Disaster Reduction Initiatives* is a major output of ISDR Secretariat published in 2003. The document represents a global review of and resource on disaster reduction initiatives. Disaster risk reduction is seen in the broader context of sustainable development. The escalation of severe disasters is seen to be imposing an increasing threat to both sustainable development and poverty reduction initiatives. It is argued that the post-disaster reconstruction period provides the most opportune time to introduce disaster reduction into sustainable development planning. Therefore, political commitment and social acceptance of the value of risk reduction are necessary for forward-looking developers who want to increase the sustainability of communities.
17. *World Disasters Report 2001: Focus on Recovery* examines how governments and aid agencies are working to promote recovery from mega-disasters within a sustainable development paradigm. *World Disasters Report 2002: Focus on Reducing Risk* argues that risk reduction is an essential condition for sustainable development. It examines disaster preparedness and mitigation initiatives from disaster-prone countries across the globe. Included are chapters featuring the challenges and opportunities facing risk reduction and disaster preparedness, with success stories from Mozambique and Latin America, and details of mitigating effects of global warming in Pacific island states, among many other examples of good practice. See http://www.ifrc.org/publicat/wdr/
18. http://www.ifrc.org/publicat/wdr/
19. See references in the bibliography from institutions in Latin America and the Caribbean, Asia and Africa.
20. http://hdr.undp.org/hd/default.cfm
21. http:/hdr.undp.org/aboutus/default.cfm
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