

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).<sup>1</sup>

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.<sup>2</sup>

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.