

# TECHNICAL ANNEX

The Technical Annex provides supporting material on methodologies and results to supplement the main body of the Report. In particular, it provides background on the statistical work undertaken in the development of the Disaster Risk Index (DRI).

This is a detailed account of the work that was carried out in the DRI, the challenges that require further attention and the potential that exists for further work.

## T.1 Definition of Statistical Terms

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In the Glossary, we have included a set of key terms which are referred to throughout the Report. In order to aid comparability, in most cases we stay close to those used in the ISDR Secretariat publication *Living in Risk*. At the same time, the development of the DRI required the adoption of specific working definitions that guided the statistical analysis undertaken.

In this section, we present an extract of terms from the Glossary followed by the specific working definition of the term used in the development of the DRI.

**Natural Hazard:** Natural processes or phenomena occurring in the biosphere that may constitute a damaging event. Hazardous events vary in magnitude, frequency, duration, area of extent, speed of onset, spatial dispersion and temporal spacing.<sup>1</sup>

*In the DRI:* Natural hazards refer exclusively to earthquake, tropical cyclone, flood and drought. Only frequencies and area of extent were considered in the model. Magnitude is taken into account indirectly when possible. Secondary hazards triggered by the primary hazards mentioned above (for example, landslides triggered by earthquakes) are subsumed in the primary hazard.

**Physical Exposure:** Elements at risk, an inventory of those people or artefacts that are exposed to the hazard.<sup>2</sup>

*In the DRI:* Physical exposure refers to the number of people located in areas where hazardous events occur combined with the frequency of hazard events.

**Human Vulnerability:** A human 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.

*In the DRI:* Human vulnerability refers to the

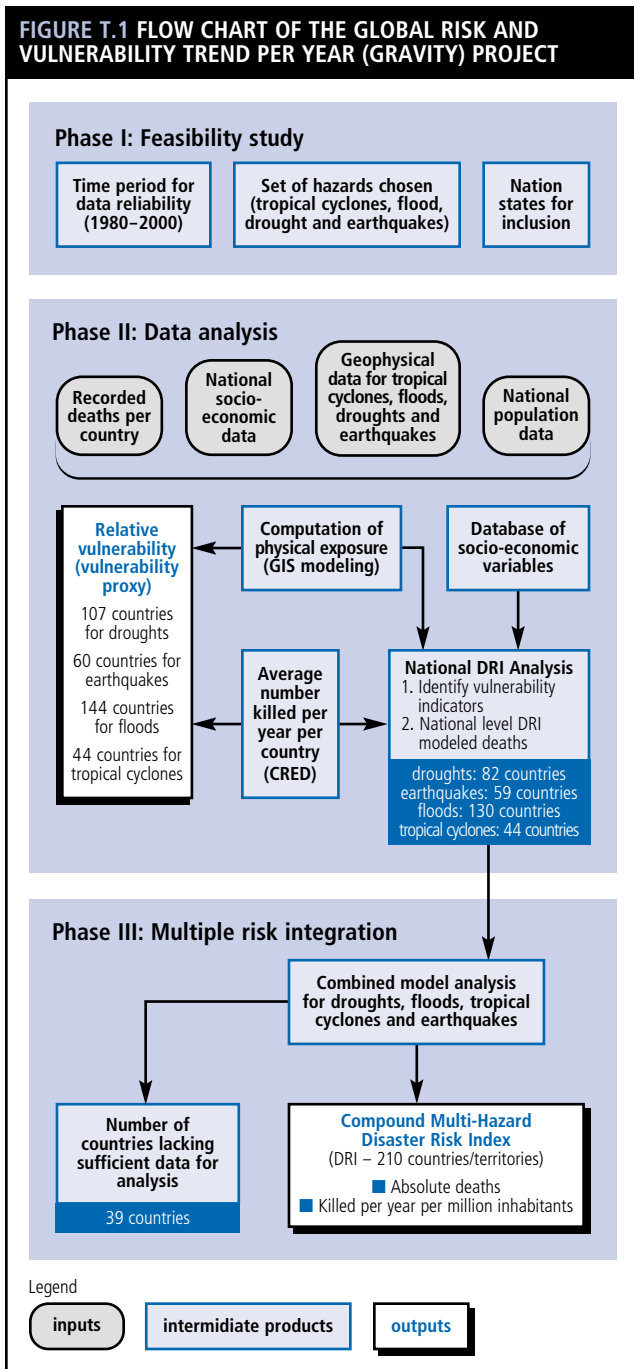
different variables that make people more or less able to absorb the impact and recover from a hazard event. The way vulnerability is used in the DRI means that it *also* includes anthropogenic variables that may increase the severity, frequency, extension and unpredictability of a hazard.

**Natural Disaster:** A serious disruption triggered by a natural hazard causing human, material, economic or environmental losses, which exceed the ability of those affected to cope.

*In the DRI:* Disasters are a function of physical exposure and vulnerability.

**Risk:** The probability of harmful consequences or expected loss (of lives, people injured, property, livelihoods, economic activity disrupted or environment damaged) resulting from interactions between natural or human-induced hazards and vulnerable conditions. Risk is conventionally expressed by the equation Risk = Hazard + Vulnerability.

*In the DRI:* Risk refers exclusively to loss of life and is considered as a function of physical exposure and vulnerability.



## T.2 Sourcing Data

### T.2.1 EM-DAT Database

The DRI exercise is calibrated against the mortality data in the EM-DAT global disaster database. It is important to be clear about the data collection and management methods employed by EM-DAT.

The Centre for Research on the Epidemiology of Disasters (CRED) maintains the EM-DAT database at the University of Louvain in Belgium. Events that conform to a consistent definition of a disaster are included in the database. Such events meet at least one of the following criteria: 10 or more people reported killed; 100 people reported affected; a call for international assistance; and/or a declaration of a state of emergency. Information on losses comes from secondary sources (government reports, the International Federation of the Red Cross and Red Crescent Societies (IFRC) and other disaster relief agencies, Reuters, reinsurance company assessments) and is cross-checked where possible. These criteria exclude smaller loss events which are not considered disasters.