



Disaster Risk, Its Sources, and Its Reduction

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A disaster can be defined simply as an event that a community cannot cope with. Worldwide, over the period 1991-2005, 3,470 million people were affected by disasters, 960,000 people died, and economic losses were US\$ 1,193 billion (CRED 2008). Most disasters are weather-related or climate-related, mainly from tropical cyclones, wind-storms, floods including flash floods and related landslides, and droughts. Disasters can affect a small village or span more multiple countries. They kill families and neighbours, destroy houses and livelihoods, and set back long-term hopes and achievements. Their impacts can persist for many years.

The impacts differ widely according to the level of economic development. Over the same period, 1991-2005, the developing and least developed countries suffered 885,000 deaths and 401 US\$ billion in economic losses, while OECD countries suffered 62,000 deaths and 715 US\$ billion in economic losses. Small and poor countries are particularly vulnerable to natural hazards. Grenada's losses of 919 US\$ million as a result of Hurricane Ivan in 2004 were equal to 2.5 times its GDP. By decimating production and diverting scarce national resources to rebuilding activities, disasters are a particular threat to the economic security and long-term growth of developing countries and to the achievement of the Millennium Development Goals.

It is important to distinguish between the extreme event, which is a natural occurrence, and the disaster, which arises from the vulnerability of a community to the hazard event. It is often said that it is not the earthquake that kills someone, but the badly designed building that collapses on them. In other words, disasters arise because communities are located in unsafe places, are housed in unsafe buildings, and are unprepared for extreme events. Human agency is a central factor in the degree to which a natural hazard event is transformed into a disaster, and therefore disasters should be interpreted largely in human terms, rather than in traditional geophysical hazard terms. For example, poor management by the authorities of the droughts of late 19th century resulted in massive famines in India. The devastation of New Orleans from Hurricane Katrina in 2005 is now widely recognised in the United States as principally a failure of public management. From this viewpoint, the term “natural disaster” is a misnomer.

The reported number of disasters has approximately doubled over the last 20 years, owing mainly to a mix of improved reporting, population growth, increases in assets at risk, and increases in the vulnerability of communities. Weather and climate related disasters have increased faster than geologically related disasters, which is not surprising given the observational evidence and projections for weather and climate extremes. Nevertheless, the trends and their sources remain poorly described, and this is a significant handicap to those advising policymakers and political authorities.

In a recent major study being undertaken by a number of ISDR System partners, a sample of 12 countries revealed that the number of municipal disaster loss reports associated with weather-related hazard has more than doubled since 1980. While in relative terms the associated mortality is going down, the number of houses damaged per disaster loss report has doubled since 1980, which indicates that there are more weather-related hazard events and that people and assets are increasingly exposed. The number of municipality loss events in the category of 1-9 events per year has doubled since 1980, while those in the category of 10-49 events per year have quintupled. Weather-related disaster risk is affecting an ever growing area, while some areas are being affected more regularly.

About 90% of these municipal level loss reports were weather-related and therefore sensitive to any future increase in hazard intensity and frequency due to climate change. The number of loss reports associated with flooding and heavy rains is increasing faster than all other hazard types, and for example, in countries like Costa Rica these have at least quintupled since 1990. Flood-related hazards are increasing in those major cities in which disaster losses have been historically reported.

But it is important to note the evidence from Africa, Asia and Latin America that this expansion of weather-related disaster risk has closely mirrored development-related processes such as the expansion of cities or the expansion of the agricultural frontier into previously sparsely populated areas. It is necessary to carefully map and model these socio-economic processes and not assume that increased risk arises from processes of climate change.

Any increases in weather and climatic extremes will create a magnifying effect on the distribution of disaster risk. For example, mortality risk to tropical cyclones is approximately 200 times more in low-income countries than in OECD countries, and therefore any increases in the severity of cyclones can be expected to magnify the current unevenness of the distribution of risk. It is estimated that about 2% of the GDP of Madagascar is at risk annually from Category 3 cyclones but the corresponding figure for Japan is only 0.1%. If these Category 3 cyclones were to increase to Category 4 storms, the additional losses would be 1.3% of GDP for Madagascar but only 0.07% of GDP for Japan.

In addition to the expected increase in hazard extremes, changes in mean climate conditions will undermine the resilience of poorer countries and the ability of their citizens to absorb loss and recover from extreme events and disasters, owing to decreases in agricultural productivity, water and energy stress and increased disease vectors. It is this combination of increasing hazard and decreasing resilience that makes climate change such an issue as a new global driver of disaster risk for the security and economic development of the poor.

The exposure of populations and economic assets to hazards is increasing particularly in coastal and urban areas, and small island states have the highest ratios of economic losses to their capital stock. Globally, however, losses relative to the size of GDP and adjusted for inflation, appears to be fairly stable. Relative mortality risk associated with weather-related hazards may actually be declining in some regions, reflecting improved development conditions, preparedness and response.

Other relevant lessons are that disaster risk is strongly concentrated, firstly geographically, where for example, about 80% of estimated economic loss risk for cyclones occurs in only 5 countries, and secondly in the small number of very large disasters (over 10,000 deaths), where most of the observed mortality is concentrated. Low income countries suffer the highest mortality risks associated with weather related hazards and their economic loss risk is also high relative to the size of GDP.

The methods and tools of disaster risk reduction include risk assessments, improved zoning of land, enforcement of building codes, safer hospitals and other critical facilities, better early warning systems, management schemes for floods and droughts, accessible insurance schemes, and community programmes to assess and manage their own risks. Many sectors have well-established risk management strategies and undertake routine management of weather and climate-related risks, especially in agriculture, fisheries, water resources, tourism, health, and public safety. These approaches are ready and waiting to be applied to the requirements of adaptation, and will need to be a core subject area of the proposed IPCC special report on extreme events and disasters.

The internationally agreed guide to disaster risk reduction, the Hyogo Framework for Action (UN/ISDR, 2005), which is subtitled “building the resilience of nations and communities to disasters”, is increasingly being used by governments and organizations to structure and guide strategies and programs to reduce disaster risk. It sets out a comprehensive set of five priorities for action, with the overall aim to achieve “a substantial reduction of disaster losses, in lives and in the social, economic, and environmental assets of communities and countries by 2015”.

A recent review undertaken by the UNISDR indicates that progress by countries towards this objective is rather mixed. Many countries are making good progress in strengthening their institutional systems, legislation and technical capacities, and in improving early warning and preparedness systems. However, most countries report little progress in mainstreaming disaster risk reduction considerations into social, economic, urban, environmental and infrastructure planning and development. This means that progress toward addressing the root causes of vulnerability to natural hazards, which is a more challenging task, is very limited, most probably because of inadequacies in political commitment and investment.

In many countries, there seems to be little synergy between the policy and strategy frameworks created to address disaster risk and those that deal with development and poverty reduction, such as the Poverty Reduction Strategy Papers (PRSPs) and those that deal with climate change such as the National Adaptation Programmes of Action (NAPAs). On the other hand, Parties to the UNFCCC have explicitly noted in the Bali Action Plan the need for risk reduction strategies, risk management and risk transfer as part of the agenda for adapting to climate change. A follow-up submission to the UNFCCC by the UNISDR has elaborated on key issues and approaches for each of these three categories.

The major ISDR System study referred to above, the first biennial Global Assessment Report on Disaster Risk Reduction, represents a landmark technical assessment of disaster risk and disaster risk reduction. Due to be launched by the UN Secretary General in Bahrain in May 2009, it will provide a significant advance in the global picture and understanding of disaster risks, including through its significant upgrading of the available global spatial data sets on natural hazards and

disaster risks. It will therefore provide a foundational resource for the proposed IPCC special report. The assessment is being coordinated by the UNISDR secretariat, in collaboration with UNDP, the World Bank, UNEP, WMO, ProVention Consortium, UNESCO and a large number of other ISDR System partners. This 2009 report puts a particular focus on the challenge of reducing both disaster risk and poverty in the context of global climate change.