



# Nature, Disaster, and Recovery

*Disasters reflect the ways societies structure themselves and allocate their resources.*<sup>1</sup>

**O**n December 26, 2004, an undersea earthquake measuring 9.0 on the Richter scale hit off the coast of Sumatra. The fast-moving tsunamis it generated devastated the shores of countries from Indonesia to Somalia, killing an estimated 220,000 people and leaving 1.5 million people homeless.

Three months later, an 8.7 magnitude earthquake with roughly the same epicenter generated widespread panic at the prospect of another tsunami and killed almost 2,000 people in Indonesia. Then, in the fall of 2005, a record number of hurricanes battered the Caribbean, Mexico, and the U.S. Gulf Coast. At the same time, Central America experienced a series of natural disasters including a hurricane, flooding, and an earthquake.

Most recently, world attention focused on the powerful 7.6 magnitude earthquake that struck the region bordering Pakistan and northern India on October 8, 2005. A humanitarian disaster of enormous proportions, the earthquake devastated towns and villages throughout the region, leaving tens of thousands of dead and injured, and millions homeless. In Pakistan, the official government estimate of the death toll was 86,000. India did not escape the devastating effects of the quake, with estimates of over 1,000 deaths.

The reported number of disasters has been increasing, growing from fewer than 100 in 1975 to more than 400 in 2005. This increase has many

possible explanations (box 1.1). Without doubt, though, the cost of disaster damages has been exploding:

the economic costs of major disasters in constant dollars are now estimated to be 15 times higher than they were in the 1950s—\$652 billion in material losses in the 1990s (IMF 2003) (figure 1.1).

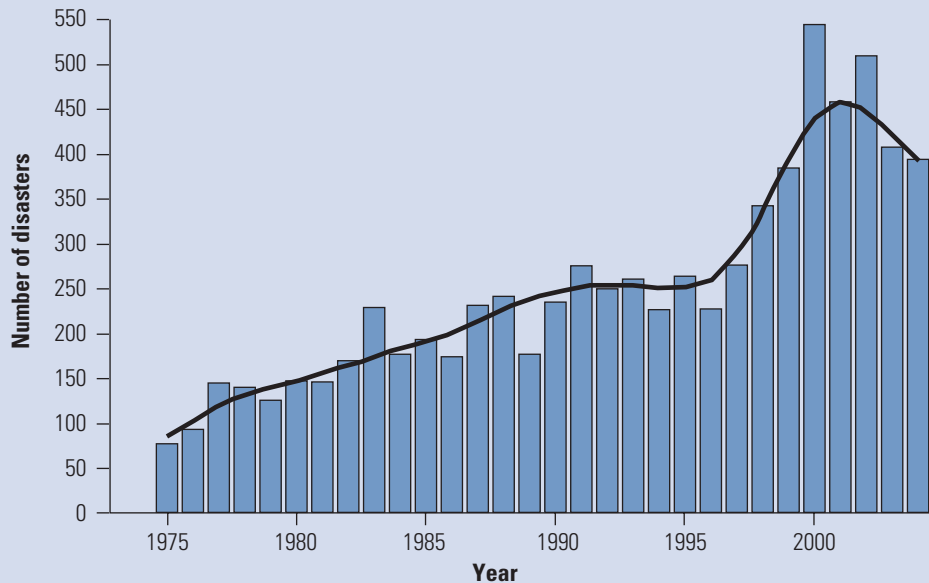
The human cost is also high: over the 1984–2003 period, more than 4.1 billion people were affected by natural disasters (Guha-Sapir, Hargitt, and Hoyois 2004, p. 85). The number of people affected has also been rising, from 1.6 billion in the first half of that period (1984–93) to almost 2.6 billion in the second half (1994–2003), and has continued to increase in the current decade (Guha-Sapir, Hargitt, and Hoyois 2004, p. 85).

This growth in damage to built environments and to the societies that use them is a product of human actions. Social and economic vulnerability to natural events is rising as the world becomes more populated. The pursuit of economic opportunity brings more people into

*Natural disasters are becoming increasingly destructive.*

### Box 1.1: Why Do Natural Disasters Seem to Be Increasing in Number?

Several factors contribute to the apparent increase in the number of reported disasters.



Source: EM-DAT: The OFDA/CRED International Disaster Database—www.em-dat.net—Université Catholique de Louvain, Brussels.

- Increases in relief and reconstruction assistance have encouraged international reporting of more disasters. This is particularly the case for smaller events, which were previously treated as a local concern (IFRC 2005).
- More specialized agencies are tracking natural events and their disastrous impacts. Many country governments have now developed specialized agencies for tracking and reporting on natural disasters. The increased accuracy of observation and reporting on the weather contributes to the increase in reported extreme weather events—a 50 percent increase each decade from the 1950s to the 1990s (Guha-Sapir, Hargitt, and Hoyois 2004).
- Sea temperatures have risen. A rise in tropical sea temperatures of up to 2 degrees Fahrenheit over the past century has contributed to an increase in weather-related disasters, some of which may be cyclical in nature (Webster and others 2005).

#### *Human actions that contribute to the destructiveness need to be addressed.*

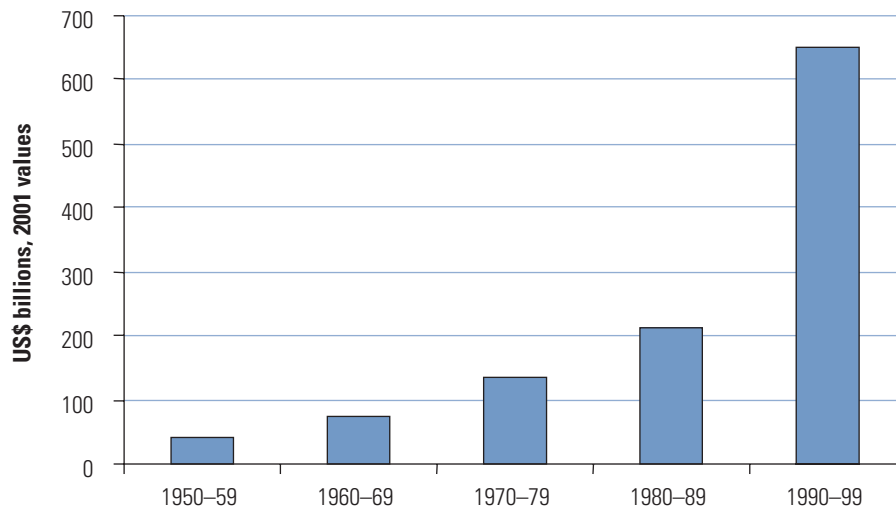
urban settings and fragile coastal areas where the damage of earthquakes and extreme weather events is often greatest.

The more vulnerable people are, the more disastrous a natural event will be. Increasing environmental degradation also contributes to the intensification of the effects of natural events.

- In **drought**, problems associated with a shortage of water are exacerbated by deforestation, soil erosion, and inappropriate land use.
- **Floods** are caused by the silting up of rivers

and the loss of absorptive capacity of the soil—both legacies of poor agricultural practices that destroy groundcover and other natural environmental defenses.

- **Human actions that contribute to the destructiveness need to be addressed.**
- Destruction of forests and overgrazing to meet the needs of growing population leads to **desertification**.
- **Earthquakes** are most destructive in countries with poor building code enforcement and high seismic vulnerability of construction, and when landslide-prone, steeply sloped land loses grass and forest cover and becomes occupied by informal housing.

**Figure 1.1: The Cost of Disaster Damage Is Rising**

Source: IMF 2003.

Note: Data are for "great" disasters, in which the ability of the region to help itself is distinctly overtaxed, making interregional or international assistance necessary.

## Developing Countries and Natural Disasters

Although disasters caused by natural events occur throughout the world, losses to disaster in developing countries are generally much higher than in developed countries in percentage of gross domestic product (GDP) or government revenues. For example, Maldives' tsunami losses amounted to 66 percent of GDP. Hurricane Mitch caused losses equal to 41 percent of GDP in Honduras.

Even when the national impact is relatively small, the local impact may be catastrophic—the 2004 tsunami is estimated to have reduced Indonesia's GDP growth by just 0.1–0.4 percent, but the province of Aceh suffered destruction of its capital stock equivalent to 97 percent of its GDP. Small island nations can lose multiples of their GDP to natural disasters: Grenada lost 200 percent of its GDP to Hurricane Ivan.

The damage caused by large disasters can also outweigh development assistance. The Kashmir earthquake of October 2005 caused an estimated \$5 billion in damage in Pakistan,<sup>2</sup> roughly equivalent to the total official development assistance for the preceding three years, and equivalent to the amount the World Bank had lent to the

country over the preceding 10 years.<sup>3</sup>

The impacts of natural disaster on societies also differ, depending on their

level of development. In December 1999, landslides in Venezuela and storms that hit France caused similar amounts of physical damage, estimated at about \$3 billion in both cases. But the human costs differed greatly: there were 50,000 deaths in Venezuela compared with 123 in France.

The disproportionate effect on developing countries has many explanations. One is simply that areas of the world that have harsh climatic conditions, are subject to extreme weather, or have unstable geology are difficult to develop, and development gains can be fragile and easily overwhelmed by the effects of natural events. Lack of development itself contributes to disaster impacts, both because the quality of construction often is low and building codes, land registration processes, and other regulatory mechanisms are lacking, as well as because numerous other development priorities displace attention from the risks that natural events present.<sup>4</sup>

*Impacts of natural disasters are very large in developing countries.*

*Lack of development contributes to destructiveness.*

### Response, Recovery, and Reconstruction

The first days following a disaster are typically very dynamic, in part because the global and national media sharply and swiftly focus attention on the immediate needs of victims and because of the risks to health and social order. Donors and governments are compelled to act. However, their initial actions affect all future actions.

A Harvard University study of 30 disaster and relief and reconstruction efforts concluded that initial actions are never neutral—they either support longer-term development or undermine it (Anderson and Woodrow 1989). In the first months after a disaster the situation remains

*The actions of the first few days affect all future decisions.*

highly dynamic—needs can shift very quickly and missteps are common and can have serious consequences. In Bolivia, for example, initial relief efforts created additional difficulties for the recovery (box 1.2).

Without question, attention to natural disasters is growing. In particular, the recent Asian earthquakes focused the world's attention on the magnified effects of disaster in developing countries and generated commitments of support from donor nations. Shortly after the tsunami

disaster, an unprecedented outpouring of international support provided assistance to the affected populations. But donor promises during the first few weeks following a disaster are usually reduced later, or even dropped altogether, when initial estimates of need prove too high or when the sudden inflow of assistance exceeds the country's ability to manage the funds.

In any event, most of the costs of recovery ultimately are borne by the country itself. The Organisation for Economic Co-operation and Development (OECD) Development Aid Committee has reported that outside financing and donations usually offset less than 10 percent of a country's disaster losses (Linnerooth-Bayer and Amendola 2000). Hence, disasters can represent a permanent loss of development momentum.

Although the destructive impacts of disasters are tightly connected with development, disasters are typically treated as an interruption in development rather than as risks that should be a calculated part of development. Some countries are in a near-permanent state of recovery. The countries themselves also tend to lose sight of long-term priorities related to reducing their vulnerability to disasters as immediate needs are met and media attention

#### Box 1.2: A Troubled Relief Compromises the Ability to Recover

Following an earthquake that devastated the urban areas of Aiquile, Totorá, and Mizque on May 22, 1998, the Government of Bolivia requested an International Development Association (IDA) reallocation of \$5 million from the El Niño Emergency Assistance Credit to help finance reconstruction. A Bank technical mission found that a number of troubling decisions had been made on how temporary shelter would be provided:

- Victims of the disaster had been obliged to abandon their homes and possessions and move to refugee camps under military control, where they were fed for free. This effectively destroyed the local economy and, without commerce, few could afford to pay for services.
- Victims had not been allowed to recover the recyclables from their

homes (doors, windows, floor and roof tiles, kitchen and bathroom fixtures), which represented about 70 percent of their cost.

- Bulldozers knocked down damaged buildings without preserving the boundary lines between properties, paralyzing subsequent rebuilding efforts.
- Temporary settlement camps had been set up in a manner that led to social disintegration and abetted robbery and assault.

The Bank ultimately directed the requested reallocation to rural housing. The way in which the early part of the process was managed had severely compromised the recovery of the urban areas, because the Bank funds would have filled a major gap in the assistance needed to rebuild the cities, had they been directed there.

Source: Field interviews and observation in 1998 and World Bank data.

turns elsewhere. Mitigation, prevention, and disaster risk management often drop off the development agenda and may be neglected as attention returns to other pressing development priorities.

Cleaning up the damage and rebuilding structures without addressing the human actions that turn recurring natural phenomena into disasters only ensures that the inevitable next event will be as disastrous as the last. Annual flooding only regenerates agricultural soil when human settlements are not located in floodplains. Where environmental degradation turns seasonal events into disaster, environmental restoration needs to be part of the solution. In other places, increased attention to infrastructure and settlement design is all that is required to increase disaster resilience. Effective activities that address root causes of vulnerability and mitigate the potential for future damage are crucial to reducing the steady erosion of development gains that natural disasters represent.

### The World Bank and Natural Disasters

The World Bank has financed reconstruction since its inception and increasingly has been engaged in helping countries recover from disasters and reduce their future vulnerability to natural hazards. Since 1984, most of the Bank's borrowers—110 countries in all—have sought emergency financial assistance related to disaster.

Since the 1970s, requests for Bank financing of post-disaster reconstruction projects, humanitarian crises, and post-conflict recovery have grown steadily. A succession of Bank policy statements has been developed to guide this work: Operational Policy Note (OPN) 10.07, *Guidelines for Bank Participation in Reconstruction Projects after Disaster* (1984); Operational Directive (OD) 8.50, *Emergency Recovery Assistance* (1989); and Operational Policy (OP) 8.50, *Emergency Recovery Assistance* (1995). Table 1.1 outlines the key provisions of the current policy (Annex A analyzes the evolution of policy over its 20-year existence). The changes in policy over time were made primarily for institutional reasons (because all Bank policies were changed

from OPNs to ODs, and then into OPs).

The Bank's three policy statements reflect an evolution in thinking about its response to emergencies such as natural disasters. The three statements differ in how they characterize emergencies, what emergencies are covered, and in several other areas, but all make timeliness a key concern. This concern led to the creation a quick-disbursing instrument in the 1984 OPN. The Emergency Recovery Loan (ERL), as it came to be called, has become the instrument of choice in lending for natural disaster emergencies. Although policy has evolved, the changes have been made without benefit of evaluation or knowledge of Bank experience.

Although it has a policy on emergency assistance for disasters, the Bank has never had a strategy for that assistance. Therefore, strategic planning for natural disasters has been confined to country-level analyses in Country Assistance Strategies (CASs) and Poverty Reduction Strategy Papers (PRSPs).

The Bank is one of a large number of institutions that countries can call on and coordinate after a disaster. Indeed, the number of institutions that respond to disaster has been growing, making donor coordination an increasing challenge.

The roles of the various institutions are not fixed and have blurred over time, though they tend to follow traditional strengths. For instance, the Red Cross/Red Crescent Society and other international and national nongovernmental organizations, along with the military, typically participate in the immediate response. The United Nations Development Program (UNDP) focuses more on the social aspects of recovery. The World Bank typically concentrates on infrastructure and housing during the reconstruction, given its

*Disasters are often treated as an interruption in development rather than as a risk to development.*

*Most Bank borrowers have sought assistance related to natural disasters.*

*The number of institutions responding to disaster is growing and coordination is becoming more complex.*

**Table 1.1: Key Provisions of Current Bank Policy Statement**

<b>Relief and consumption</b>	The Bank does not finance relief and consumption (par. 2 and 4).
<b>Support for damage and needs assessment</b>	The Bank provides immediate support in assessing the emergency's impact and develops a recovery strategy (par. 3).
<b>Implementation time</b>	ERLs are fully implemented in two to three years (par. 6).
<b>Procurement rules</b>	Standard Bank Operational Policies, including those on procurement, consultants, and disbursement, apply to ERLs (par. 8).
<b>Suitability for recurrent disasters</b>	Regular investment projects (not ERLs) may be preferable for recurrent disasters (floods) and slow-onset disasters (droughts) (par. 5).
<b>Design standards, prevention, and mitigation</b>	ERLs use disaster-resilient construction standards, emergency preparedness studies, and technical assistance for prevention and mitigation. Prevention and mitigation projects carry out studies of vulnerability and risk assessment, reinforce vulnerable structures, adjust building and zoning codes, and acquire hazard-reduction technology (par. 6).
<b>Institutional and regulatory framework</b>	The Bank helps countries to establish an adequate institutional and regulatory framework for prevention and mitigation (par. 10).
<b>Donor coordination</b>	Collaboration with the UNDP and other international agencies, local nongovernmental organizations, and donors is helpful in designing the recovery assistance strategy under an ERL and in designing specific prevention and mitigation programs (par. 9).

Source: Operational Policy 8.50 – Emergency Recovery Assistance, August 1995.

Note: ERL = Emergency Recovery Loan.

comparative advantage in that area. However, the Bank also has considerable experience with disaster recovery, as well as an important role in assisting with coordination that ensures that country needs are met with as few overlaps and conflicts of priorities as possible.

A key partnership of the Bank in natural disasters is the ProVention Consortium, launched in February 2000 to reduce disaster risk in developing countries and to make disaster prevention and mitigation an integral part of development efforts. The Consortium is an international network focused on sharing knowledge and leveraging resources to reduce disaster risk. Though launched by and originally housed in the Bank, it is currently under the management of the International Federation of Red Cross and Red Crescent Societies in Geneva. This report does not evaluate the partnership, but the Independent Evaluation Group (IEG) will be evaluating it in 2006, and therefore offers no judgments on its performance in this report. The current evaluation does draw on ProVention analyses.

## The Evaluation

Heightened global awareness, increased public and private generosity, growing Bank investment in disaster recovery as well as disaster prevention and risk management, and greater ability to anticipate some natural events make this an appropriate time for the World Bank to review and update its policy and upgrade practices with respect to natural disasters. This evaluation has been undertaken to inform that process.

No assessment has previously been done of the Bank's disaster-related assistance. The evaluation assesses the relevance and effectiveness of Bank activities related only to *emergencies caused by natural events*. Emergencies caused by armed conflict have been the subject of an earlier evaluation (IEG 1998), and thus are not covered by this report.

The study was conceived as a review of the implementation of Bank policy and examined the relevance and effectiveness of Bank operations, as well as their institutional development impact, to develop lessons from experience. The evaluative questions addressed are detailed in Appendix B.

### Evaluative Instruments and Methods

The study examined the Bank's experience from several angles. The basic approach was to avoid sampling, and instead identify *all* Bank-financed projects with natural disaster activities. For example, in the staff survey, all task managers that worked on at least one project with disaster activities were invited to respond. When the evaluation looked at an activity (such as housing) or a disaster type (such as tropical storms), all the relevant projects were reviewed. Hence, different analyses use different numbers of projects, but all use the full universe of projects relevant to that issue. The key study instruments were as follows (see Appendix B for details and the methods used):

- **Expert knowledge** – *No previous assessment has been done of Bank assistance for natural disasters.* through an extensive review of the literature and the use of an Advisory Panel
- **Bank-financed projects and activities** – through a review of the portfolio of projects and analysis of a textbase of project information
- **Staff knowledge** – through surveys and interviews
- **Detailed examination of critical issues and countries** – through issues papers and case studies (field-based and desk studies).