

- *Strengthening management systems for natural disasters.* As discussed at the end of this section several types of investments are required to improve the detection and prevention of natural disasters, as well as postdisaster management.
- *Regional goods.* Small island developing states are particularly reliant on improved regional goods, such as economic cooperation or regional infrastructure (chapter 15).

In addition to these recommendations that apply across small island developing states, the major regional clusters of island countries have their own specific needs. In the Caribbean these include:

- *Health services.* At 2.3 percent and rising, HIV prevalence in the Caribbean is second only to Sub-Saharan Africa (UNAIDS 2004). Maternal mortality remains high in many countries, reaching 680 deaths per 100,000 births in Haiti, and disease and malnutrition remain severe problems in some (UNDP 2004a). Priorities include improved training of health personnel and assistance in meeting high treatment costs for communicable diseases.
- *Education.* Given the Caribbean dependence on external trade, the erosion of trade preferences for bananas and the final implementation of the Agreement on Textiles and Clothing will require adjustment to develop new industries to replace declining ones. Job training and skills development will be particularly important to improve human capital across the Caribbean and to support workers displaced by global market adjustments.

Many of the Pacific small island developing states are widely dispersed archipelagos that are far from world markets. In several of these countries, national averages mask striking developmental disparities between inner and outer islands, and between rural and urban areas. The countries' special MDG investment needs include:

- *Health investments.* Though many countries feature strong health indicators, others face damaging resource shortages. The government of the Solomon Islands, for example, has been unable to pay doctors and other health workers regularly, causing declines in health service delivery (Asian Development Bank 2003).
- *Education and science and technology.* Many Pacific countries have had difficulty generating productive employment opportunities for young people and consequently have seen increases in the number of women turning to prostitution. Investments in vocational training, advanced education, and technology development will help these islands diversify and expand the range of available opportunities.

Countries vulnerable to natural hazards

Many developing countries experience frequent natural hazards, including drought, floods, cyclones, earthquakes, and landslides. The countries most

vulnerable lie in the Caribbean, Central America, Oceania, southern and eastern Africa, and Southeast Asia (map 11.4). Many are vulnerable to several types of disaster, often several times a year. As indicated above, many small island developing states have especially high disaster risks.

A large number of the highest-risk countries are in the low-income category, with droughts and floods particularly prominent among their risks.³ In Sub-Saharan Africa, disaster risks related to drought are particularly high. Meanwhile, flood-related risks are especially high in Asia, Central America, and Andean and Southeastern South America. In the tropics and subtropics, heavy rainfall events that lead to flooding can also be accompanied by outbreaks of infectious disease, including malaria. Earthquakes, prevalent at tectonic plate boundaries around the Pacific Rim and across Central Asia, are particularly destructive to low-income countries, where infrastructure is seldom built to appropriate seismic safety standards or to deal with related risks like tsunamis.

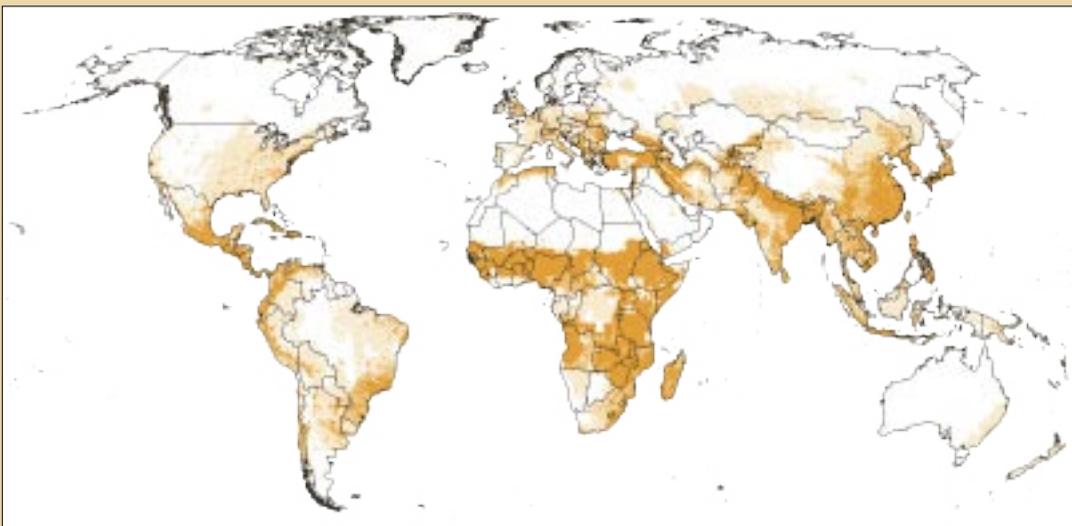
Natural disasters cause enormous damage. They leave large proportions of the population at risk of losing their livelihoods, their homes, and often their lives. But smaller, more frequent disasters also have significant impacts,

Map 11.4

Areas at highest natural disaster-related mortality risk

Mortality decile, all causes

Source: Dilley and others 2005.



□ 1st–4th deciles

□ 5th–7th deciles

■ 8th–10th deciles

□ Low population density

especially in developing countries with poor infrastructure and weak response capacities. Population groups that are typically most at risk include smallholder farmers, rural landless poor, fishers, and the urban poor. Apart from the direct economic loss, vulnerability to natural disasters also contributes to economic volatility, which in turn contributes to higher risks and higher costs of investments. Evidence suggests that in some cases natural disasters and the ensuing environmental stress, such as drought-induced crop failures, can fuel conflict (chapter 3).

It is important to stress that the furies of nature systematically claim the lives of the poor in much greater numbers than they do the rich. When disasters strike regions that include both developed and developing countries, as the devastating 2004 hurricanes in the Caribbean and Southeast United States did, it is in poor countries where most lives are lost. People in low-income countries are four times as likely to die in a natural disaster as people in high-income countries, and in developing countries disasters cause annual economic losses of 2–15 percent of GDP (Kreimer, Arnold, and Carlin 2003).

What the rich world suffers as hardships, the poor world often suffers as mass death. The rich, unlike the poor, can afford to live in fortified structures away from floodplains, riverbanks, and hillsides. They have early warning systems, such as seismic monitors, weather forecasts, and disease surveillance systems. And they have cars and trucks that enable them to leave on short notice when natural disaster threatens. Moreover, rich countries, unlike poor ones, can quickly mobilize food, drinking water, backup power generators, and doctors and emergency medical supplies in the aftermath of a disaster.

In recent decades, population and economic growth have been higher on average in coastal regions that are highly exposed to cyclones and floods. Losses per event will rise in the future, particularly in rapidly growing urban areas, unless systematic efforts are made to reduce vulnerability. Climate change is further expected to affect rainfall and temperature patterns, altering the frequency, severity, and location of climactic hazard events. Climate changes may result in rising sea levels, which would contribute to storm surges and flooding and enhance the hydrologic cycle, altering patterns of extreme events such as drought (IPCC 2001a).

For countries at risk, strategies to reduce losses associated with natural disasters need to be mainstreamed into MDG-based poverty reduction strategies and fall under four broad categories: infrastructure investments, investment in safety nets, early warning systems, and emergency and contingency plans.

First, in places at risk of natural disasters, investments in infrastructure are necessary to minimize the damage from natural disasters. These can include earthquake-proof buildings, emergency shelters, and protective embankments. Such preemptive planned investments can minimize not just the loss in lives and incomes, but also the disruption of strategies for achieving the Millennium Development Goals. They are particularly important in rapidly growing

cities since uncontrolled urban growth increases vulnerability to disasters. For this reason urban planning must include systematic risk assessments, design appropriate land use plans, and set construction standards.

Second, ongoing investments in social safety nets are necessary to safeguard lives during times of crisis. Governments need to make these investments during noncrisis periods in order to establish an institutional presence capable of effectively delivering services when shocks or disasters occur. During drought, for instance, employment guarantees, microfinance schemes targeted at the hungry, and the protection of livestock-based livelihoods can all play a role in protecting communities exposed to crisis.

Third, governments should invest in building and strengthening national and local early warning systems to monitor conditions and provide advance warning of potential disasters. Few natural disasters can be prevented, but their impacts can be mitigated by advance planning, advance notice, and a comprehensive response. Surveillance systems can include field monitoring, remote sensing, and meteorological forecasting. Properly designed early warning systems can provide a critical window of opportunity to act before a crisis strikes. Public information campaigns are important for raising awareness of the risks of natural disasters and adequate responses. Early warning capabilities for managing climate hazards have been greatly enhanced in recent years through seasonal-to-interannual climate forecasting.

Fourth, precrisis emergency and contingency plans need to be drawn up so that early warning systems can yield an early and effective response. Plans should include strategies for evacuation, emergency safety zones, insurance schemes, and the prelocation and financing of humanitarian resources for rapid distribution. As part of contingency plans, governments must establish mechanisms for delivering emergency services after a disaster has occurred, especially immediate healthcare to prevent the outbreak of disease amongst displaced populations. Developed countries should establish a far more systematic financial mechanism for disaster response, including contingent credit investments for individual countries. Once triggered, responses need to be more rapid, and disbursement decisions need to be made more flexible than they are at present. For example, the UN's Immediate Response Account has recently been funded at only \$35 million, which would cover only two weeks' worth of food in a large operation. A level of \$300 million would be more appropriate to facilitate rapid response at the outset of a food crisis (UN Millennium Project 2005d).