

population influx combines with fragile infrastructure to produce unprecedented vulnerabilities. In general, one expert observes, "... the earthquakes of Tangshan, China, in 1976, with 275,000 fatalities, and Kobe, Japan, in 1995, with losses in excess of \$ 120 billion, are harbingers of the extraordinary loss and destruction that natural disasters can cause in a modern urban environment."¹⁴

A hazard may be defined as a phenomenon that may cause disruption to humans and their infrastructure. Atmospheric and geophysical extremes therefore can be regarded as "natural" hazards in the sense that they are inevitable. By contrast, disasters – i.e., events that can cause such disruptions, often involving entire communities, persisting after the hazardous event has come and gone, and exceeding the ability of the affected communities to recover unaided – reflect the ways societies do business. In this sense, the so-called "natural disasters" are primarily social in origin. They result from decisions and policies with respect to land management and land use, building and engineering practices, as well as the presence of supportive social institutions.¹⁵ In situations where societal care frameworks are weak or altogether absent, the impacts of natural disasters can be politically just as destabilizing as are conflicts that arise out of political, economic, ethnic, religious or territorial disputes.¹⁶ In that sense, natural disasters can be viewed as crises for they can create large numbers of refugees and/or IDPs in need of humanitarian relief and assistance in order to prevent even greater disasters, such as famines, epidemics, large scale political unrest or even complete societal breakdown, from taking place.

Monitoring Requirements

Natural disasters cannot be prevented, but their social and economic impacts can be mitigated through a set of activities and processes designed to lessen their effect – the disaster management program. Typically, a disaster management cycle can be broken down into three components, or phases: 1) Prevention and Preparedness; 2) Emergency Response, and; 3) Recovery. Each phase can be further divided into areas of dominant activity, with each link in the chain subsequently supporting all other and forming together a seamless system for managing disasters.

Prevention and Preparedness

Prevention involves activities implemented in advance of the event and which are aimed at the reduction of risk to human life, property and productive capacity. It leads to the collection and analysis of data to evaluate the likelihood of hazards taking place and the vulnerability of particular locations to these hazards. These result in the production of risk and vulnerability assessments. This activity goes under the term of Danger Assessment. Preparedness, on the other hand, refers to pre-event activities designed to increase the level of operational readiness for responding to and coping with a specific hazard. The dominant activity in that case takes the form of Detection and Early Warning.

Emergency Response

This is the crisis stage. It involves actions taken at the outset, during and immediately after the disaster intended to reduce the impact of the event after it occurs. During the crisis stage the dominant activities are Impact Assessment, to assess the extent, severity and location of the damage and thereby facilitate the provision of appropriate relief measures, and Emergency Relief, which involves activation of pre-planned relief strategies and the delivery of relief measures.

Recovery

These are actions taken to implement remedial measures in the weeks and months after the event. They result both in short-term activities, or Rehabilitation, to quickly revitalize life-supporting system in order to reduce the possibility of secondary damages, as well as long-term activities, or Reconstruction, where the goal is returning life to normal or improved levels.

¹⁴ Robert M. Hamilton, "Science and Technology for Natural Disaster Reduction." *Natural Hazards Review* (February 2000), p. 59.

¹⁵ The U.S. Science and Technology Council, Committee on the Environment and Natural Resources, Subcommittee for Natural Disaster Reduction, *Progress and Challenges in Reducing Losses From Natural Disasters – Report*. Available online @: <http://www.usgs.gov/themes/sndr/sndr09.html>.

¹⁶ G. Ted Constantine, *Intelligence Support to Humanitarian – Disaster Relief Operations*. Washington, D.C.: Central Intelligence Agency, Center for the Study of Intelligence, CSI Monograph 95-005 (December 1995), p. 3.