

IV. Capacity to Prepare and Respond: Differences Between Developing and Industrialized Countries

The differences between disasters in the developing countries and those found in the United States result in part from different national and social capabilities. However, it is easy to overestimate the fragility of the social systems of less developed countries. Because people are poor does not mean that social relations are poor or inadequate. Social life in less developed countries maybe more easily restored than in industrialized countries. A house can be rebuilt with local labor and materials in 2 days in a developing country, while in the United States a building permit probably could not be obtained in that time. As analysis moves from individuals to institutions to national socioeconomic perspectives, the distinctions between developing countries and urban, industrialized countries become greater.

At the individual level, human beings respond as human beings whether in societies with marginal or affluent economies. Responses by people to stress induced by disasters tend to show strong cross-cultural similarities in perception and behavior. For example, panic flight is rare in any society. Severe mental breakdowns as a result of catastrophes seldom occur on any scale anywhere. Signs of impending danger tend to be perceived as normal occurrences. People tend to personalize the disaster, thinking that it has happened only to them and their surroundings, and they generally share keen anxiety over separation from family members and tend to begin an immediate, independent search for missing people. Finally, convergence of people, information, and material on the scene of the disaster immediately after it happens is seen across all cultures. *

The reference above to building permits makes the point that differences appear more sharply and

clearly at the organizational and institutional level than at the human and individual level. However, with institutional differences also come institutional similarities. For example, developed countries may have greater resources, but they have no monopoly on wisdom or the ideal model of disaster-related decisionmaking. Cities are built in flood plains and on earthquake faults in both industrialized and less developed countries.

Institutions, moreover, are a reflection of the socioeconomic capacity of the nation as a whole. At the macro level of analysis, developing countries are most readily distinguished from the industrialized nations by comparatively fewer resources available to prepare for and respond to disasters.

The continuum of similarities and differences—individual to institution to national systems—suggests the loci of possible lessons transferable to U.S. domestic disaster programs.

Institutions become the bridge between the different resource capabilities of nations and similar human needs. Transferable lessons, therefore, are likely to be those in which less developed country disaster institutions suggest organizational, managerial, informational, or educational alternatives to the resource-intensive disaster preparedness and response methods of the developed countries.

To get a clearer focus on the adaptations likely to be necessary in transferring alternative preparedness and response approaches, it is useful to identify several pressures placed on institutions in less developed countries which affect their capacity to prepare for and respond to disasters.

RESOURCES

Growing numbers of the world's population live in a permanent state of marginal existence "where-

¹Charles E. Fritz, "Disaster," *Contemporary Social Problems* (ed.) Robert K. Merton and Robert A. Nisbet (New York: Harcourt, Brace, and World, 1961), p. 655.

in the slightest natural phenomena can cause terrific loss of life and economic, social, and political disruption on a large scale,"² according to a study conducted by the United Nations Association, Panel on International Disaster Relief. The report continues:

There is now a patchwork of disaster crisis areas in the developing world—regions that are so vulnerable that they are in a virtually permanent state of emergency. Haiti, Ethiopia, Nepal, Indonesia, Bangladesh, El Salvador, Afghanistan, major sections of Nigeria, and the Sahelian countries—there are large sections of the Earth where the life-support systems are so thin that the occurrence of relatively minor natural phenomena can cause major disasters with severe adverse human effects.³

The economic conditions of less developed countries severely limit the resources available to prepare for and recover from disaster. Additionally, the human resource base is weakened by lack of economic opportunity, thus leading to increased susceptibility to disaster consequences.

POPULATION

Urbanization and internal migration are worldwide phenomena caused by real and perceived inequities between rural and urban areas. Lack of resources and problems of unemployment have resulted in increasingly higher density living and the use of marginal lands in less developed countries. This has put larger numbers of people at risk from natural hazards. As flood plains, earthquake zones, marginal agricultural lands, and verdant hurricane coasts draw more and more people, the risks of greater human suffering from catastrophes increase. In 1970, 74 percent of the 2.6 billion people in developing countries lived in rural areas. By 1980, this percentage is expected to decline to 57 percent of the population, thus thrusting nearly 1.5 billion more people into urban areas in less developed countries.⁴

High population growth rates of the developing countries exaggerate the impact of disaster. For the entire world, the growth in population between 1975 and 1990 is expected to be 33 percent. In the developing countries, this increase will be 41 per-

²*Acts of Suture, Acts of Man: The Global Response to Natural Disasters*, (New York: U.N. Association, Policy Studies Panel on International Disaster Assistance, 1977), p. 19.

³*Ibid.*

⁴Martin M. McLaughlin, et al., *The United States and World Development Agenda 1979*. (New York: Praeger Publishers, 1979).

cent, and in the least developed countries—which are the more disaster-prone—the growth will be even greater: upwards of 50 percent. As a consequence, the scope of disaster impact on human settlements must increase in the coming years.

UNPLANNED GROWTH

Through inability or unwillingness, failure to plan development in the poor and disaster-prone countries will result in greater exposure to natural and manmade hazards for larger numbers of people. The failure of macro- and micro-planning leads to uncontrolled development. Macro long-range planning of the siting of human settlements and capital development projects often neglects to take hazards into account. For example, following the huge Guatemala City earthquake of 1976, which killed over 23,000 people, building began anew in exactly the same location as the old ruined city.⁵ Similarly, Managua, Nicaragua was rebuilt on the same faultline in 1855, 1937, and 1968.⁶

The second factor in unplanned growth is micro-planning and engineering. Habitable structures in the less developed countries are often inappropriately designed for hazardous conditions. The houses of Managua and Guatemala City are largely adobe with heavy tile roofs. Furthermore, the custom in both cities is to construct the front, and often only, door to open inward for greater security against unwanted intrusion. The combination of heavy walls, the heavy roofs, and the doorway results in an inability to open the door to escape after the first earth tremors. When the quake itself strikes, the heavy tile collapses. The large majority of the dead found in both cities were jammed inside doorways.

One of the opportunities provided by disasters in developing countries is for governments to plan redevelopment. Following a disaster, international assistance is often available to plan the reconstruction of public buildings and therefore to influence the private sector growth of cities. However, in

⁵U.N. Association, *op. cit.*, p. 15.

⁶Computer printout, Office of Foreign Disaster Assistance, U.S. Agency for International Development.

⁷U.N. Association, *op. cit.*, p. 15. Following the most recent earthquake (1972) most reconstruction has been moved several kilometers from the historic center of the city and the earthquake epicenter.

many cases where outside reconstruction planning assistance has been provided, this did not guarantee an improved planning or redevelopment process. The cases of Guatemala, Lice,¹⁰ and Andhra Pradesh¹¹ have been well-documented and show inadequate reconstruction, often on the ruins of the last disaster. Parallel experiences have occurred in many reconstruction efforts in the United States, most notably in the flood-prone areas of eastern Kentucky and Johnstown, Pa.

POLITICS

The political ramifications of a disaster and its relief are usually seen to be especially influential in developing countries. This, however, may be an error of perspective. The role of politics in developing countries may appear more important than it is because of our distance from the events and lack of familiarity with the political systems. In underdeveloped countries, the domestic political systems seem less stable than in the industrialized countries, thus raising attention to political considerations in disaster. Also, ethnic, religious, and racial attitudes and rivalries are often seen to influence the functioning of disaster relief. The well-documented, apparent indifference of ruling ethnic groups to the nomadic cattle herders and other transient minorities in the drought-affected African countries south of the Sahara is illustrative.

In the United States, by contrast, the option of purposeful neglect is rarely raised. Victims may feel slighted by a bureaucracy, or an organization may move in such a muddled fashion that relief is poorly distributed; but there seems to be little conscious neglect. In the United States, there are so many organized interests advocating equity that victims eventually are served—well or badly, but served. In less developed countries, some groups are systematically ignored and become double victims, of disaster and of official neglect.

The preceding problems in developing countries are not to suggest that urban and industrialized nations offer models of political efficiency. A

⁹Comptroller General of the United States, *Observations on the Guatemalan Earthquake Relief Effort*, ID-76-71, 1976. p. 32.

¹⁰William A. Mitchell, *The Lice Earthquake in Southeastern Turkey*. (Colorado: The United States Air Force Academy, 1976).

¹¹Fred Cuny, "Recent Work in the Aftermath of the Andhra Pradesh Cyclone," Memorandum to INTERTECH member, January 1978.

major weakness of the bulk of disaster research in the social and behavioral sciences has been a failure to recognize and study the political factors that cut across all aspects of domestic disaster planning and response. Whether warnings are issued, whether a disaster declaration is sought, what kind of short-term and long-term aid is provided, the equity or lack of equity in disaster relief and rehabilitation, are all often strongly affected by political factors. They are all political decisions in certainly one sense of the term. This stands out rather sharply in the work done on earthquake predictions. Because of the time factor involved, anyone who has to consider the social consequences of predictions with respect to planning and response is forced to recognize the pervasive political overtones of all that is involved.

TRANSPORTATION AND TELECOMMUNICATIONS

A further pressure on disaster-related institutions in less developed countries is the relative lack of a physical infrastructure. Because over half of the population is located in rural areas, communications and transportation systems are important to the efficient assessment and response to disasters. Yet, less developed countries have inadequate roads, airports, railroads, telephones, and other capital development items that are essential to preparedness and response, by the standards of industrialized nations.

For example, in the area of public communication, the broadcast media plays an important role in issuing warnings of impending disaster and conducting educational campaigns. In the less developed countries, there is an average of 17 radio stations per country and 2 television stations. Fourteen of those countries, however, have three or fewer radio stations and eight have no television at all. Among the developed countries, Italy has 795 radio stations, the United Kingdom has 17, and the United States has 8,100. Additionally, the United States has 985 television stations, the United Kingdom has 300, and France has 1,500.

KNOWLEDGE OF HAZARDS

Among persons who professionally deal with hazards in the United States, there are four com-

mon complaints. These concern information on long-term trends, vulnerability of population, short-term impact needs, and capability to respond. For the less developed countries, the information base is far worse, if it exists at all.

This inadequacy of information constitutes an additional pressure placed on planning capabilities in less developed country disaster institutions, which is shared with institutions in the United States.

The Committee on International Disaster Assistance of the National Academy of Sciences has identified several information problems, of which four correspond to the four complaints above and are reviewed here: hazard analysis, vulnerability analysis, short-term needs assessment, and disaster-relevant resource analysis.

Hazard Analysis

A hazard is defined as “a potentially harmful condition whose existence and magnitude of occurrence can be expressed in probabilistic terms.”¹² The goal of hazard analysis is the understanding of occurrence patterns and the impact of past events in order to predict both occurrence and impact for the future. This is achieved by the collection and assessment of information about the nature, causes, frequency, distribution, and effects of past, and therefore potential, disasters. Given the complexity of natural hazards—the variety of agents (earthquake, wind, flood, drought, etc.) and the interaction of agents (earthquakes may cause direct damage due to the ground shaking and secondary effects through power failures and gas explosions, tsunamis, and Landslides)—large amounts of analytical data are necessary to make accurate forecasts. Both historical data (the longer the period, the more accurate the analyses and forecasts) and current, real-time monitoring of events are necessary to achieve useful forecasts.

Currently, many forms of environmental data acquisition exist: direct observations of local informants, networks of observing stations, instrument observation, satellite observation utilizing the most advanced remote-sensing technology,

¹²A *Review of the U.S. Government Foreign Disaster Assistance Programs* (Washington, D. C.: National Academy of Sciences-National Research Council, Commission on Sociotechnical Systems, Committee on International Disaster Assistance, 1978), p. 38.

¹³*Ibid.*, p. 39.

telecommunications networks, and data processing at national, regional, and world centers. For example, the world weather watch program of the World Meteorological Organization of the United Nations incorporates observation, communication, and data processing in providing member nations with meteorological data. Similarly, the Food and Agriculture Organization of the United Nations uses local ground observers, air reconnaissance, and weather information to report monthly on the crop situation in many less developed countries and warn of impending food shortages and crop failure. It was the view of the committee, however, that “The data collection methods are available, but the collection and utilization of technical data to mitigate disasters is lacking.”¹⁴ The problem, in hazard analysis, is in promoting the use of information and its dissemination in usable form.

Vulnerability Analysis

Vulnerability to hazards is a population’s susceptibility to loss when a hazard event of a given magnitude occurs.

The committee asserts that vulnerability analysis is concerned with the “human response systems to natural hazards which enlightened humans may control. All human actions that either aggravate or mitigate the effects of natural hazards must be taken into account in assessing vulnerability.”¹⁵

Vulnerability analysis requires considerable amounts of information. At a minimum, the committee writes, the following kinds of information are necessary for “known hazard-prone areas:”

- number and geographic distribution of population, buildings, and lifeline systems (e.g., public works, medical facilities);
- measurements reflecting catastrophic loss potential (e.g., structures of high occupancy such as schools and places of public assembly); and
- measurements reflecting vulnerability to secondary losses (e.g., industrial and commercial locations, dangerous materials storage).¹⁶

The problems inherent in collecting these vital pieces of information are huge. In the developing world, in particular, engineering research on struc-

¹⁴*Ibid.*, p. 41.

¹⁵*Ibid.*, p. 43-44.

¹⁶*Ibid.*, p. 45.

tures is often of little value. The great bulk of building-related fatalities have occurred in simple nonengineered structures, typically of adobe or other local construction. Furthermore, the large-scale migration of rural populations to urban centers makes vulnerability analysis more difficult. Finally, the records of natural events have not been kept for more than a few years; thus, the accuracy of predictions is suspect.

Short-Term Needs Assessment

No single factor hampers the ability of both domestic and international disaster agencies to respond to an emergency more than the lack of damage assessment and assessment of victims' needs. Damage and needs assessment are the vital components necessary for agencies to make sound decisions promptly. The U.S. missions in the impacted country frequently have not had the resources to make dependable assessments of damages and needs. In-country mission disaster relief officers who have had assessment training are hampered by communication and transportation difficulties. OFDA was reluctant for a long time to use U.S. military personnel to assess damage because it was believed that they might not be accepted in a disaster-stricken country. A Military Disaster Assessment and Survey Team was used in the El Salvador earthquake of 1965 for the first time. It was successful but demonstrated the need for better training and closer ties between the military and OFDA. William Dalton of OFDA has confirmed that improvements have taken place in recent years but that disaster assessments continue to be a prime concern of the Office.¹⁸

The National Academy of Sciences (NAS) committee report highlighted four aspects of impact and needs assessment that make the accurate interpretation of damage difficult. These aspects suggest the complexity of the problem and the paramount importance of such assessments in disaster relief. The NAS committee devoted its entire second year of activity to the study of damage and needs assessment.¹⁹

First, preimpact conditions of buildings, health, institutions, etc., need to be known to determine

¹⁷Ibid., p. 13.

¹⁸William Dalton, interview, Feb. 13, 1978.

¹⁹Committee on International Disaster Assistance, *Assessing International Disaster Needs* (Washington, D. C.: National Academy of Sciences-National Research Council 1979).

change resulting from the disaster. One of the problems with preimpact data is that, when it exists, it is often diffused throughout different administrative units. Disaster officials face difficulties in obtaining, collating, and promptly assessing such disparate information.

Second, the difficulties in collecting postimpact data revolve around inability to gain access to disaster areas, disruptions in the often inadequate communications, destruction of existing records, and the exodus of victims with potentially useful information. The NAS committee also emphasized the lack of expertise in conducting local surveys, the deficiency in methodologies for rapid ground survey assessment, the political problems involved in the use of external assessment teams, and the local and international politics involved in the assessment of needs.

Third, organizational and cultural biases enter into the assessment process. On the one hand, organizations typically commit their resources to the most visible task within their capabilities rather than assessing needs and satisfying them.²⁰ On the other hand, cultural standards of value place differing importance on different disaster-induced losses. For example, relief officials from developed countries may well be more impressed by industrial losses, while the people and officials of the stricken developing country might place a greater value on food, energy, and agricultural recovery. The problem of imposing the values of the relief donor on the recovery efforts of the disaster-impacted country increases with the unfamiliarity of donors with recipient cultures.

Fourth, "A major problem in damage assessment results from the fact that lack of damage is seldom reported."²¹ Because disaster impact damage is virtually never complete, resources for relief and recovery may exist in proximity to the disaster zone but never be utilized. The NAS committee cites mass media reports, in particular, as tending to overlook this fact because they concentrate on the drama of destruction rather than what has been untouched. In industrial societies, certainly, large amounts of resources are undamaged and can be redirected to the emergency. "Even though the level of stored resources within developing countries may not allow the same com-

²⁰Committee on International Disaster Assistance, *op cit.*, p. 28.

²¹Ibid., p. 29.

portable margin, the same situation would probably pertain in many disasters occurring in developing countries.”²² In the Managua, Nicaragua earthquake of 1972, for example, six different medical units were dispatched to the scene by almost as many countries. The earthquake, however, had done little damage to the 16 hospitals in the area and did not merit outside resources. Nearby in-country medical facilities were more readily available. Thus, a tremendous waste of resources—which could have been avoided by an accurate needs assessment— occurred during the emergency.

Disaster= Relevant Resource Analysis

The last of the four information problems associated with U.S. and developing country disaster programs lies in the fact that response to both natural and manmade disasters requires resources, both human and material. As the committee stated: “If the primary objective of international disaster assistance is to respond to victims’ needs that have not been met at the local level, it is important that agencies like AID/OFDA have documented information on the capability of developing countries to respond to various disaster-generated demands.”²³

²²Ibid., p. 29.

²³Ibid., p. 48.

Two types of information are necessary: first, the level of disaster preparedness in the disaster-impacted society, and, second, a general resource profile of the society.

The need for these two profiles of in-country disaster preparedness and available resources is an information problem shared by developing and developed countries.

In summary, the commonality—and transferrability—of disaster experiences from developing countries to U.S. programs lie in institutional adaptations of disaster procedures. Despite differences in resources, population, growth patterns, and political systems, which appear at the national level, all people have similar responses in disaster. Institutions link individual needs to national capabilities.

Two sources of institutional innovation are the focus of attention. On the one hand, developing countries have created alternatives to the resource-intensive U.S. disaster procedures. On the other hand, OFDA has adapted domestic disaster procedures to its international operations. Lessons applicable to U.S. disaster programs are to be found in these two sources of procedural, managerial, or informational alternatives.