

VI. Lessons From Disasters in Less Developed Countries for U. S. Domestic Disaster Programs

The United States, for more than the past three decades, has tried to lead the less developed nations into modernization. For better or worse, the flow of knowledge, technology, and innovation has been from America. In the disaster field, experience gained by U.S. participation with the developing countries may present a useful counter trend. In small but significant ways, developing country adaptations of informational, organizational, managerial, and educational practices could benefit U.S. domestic programs.

The first chapters of this report described the context of disasters in less developed countries and pointed out that individuals respond similarly under the stress of disaster across cultures and place similar demands on institutions. The key difference between disasters in developing countries and those in urban and industrialized countries lies in the internal capability to prepare and respond. Thus, institutions are the focus of a search for transferable lessons.

The existence of possibly useful lessons need not imply a deficiency in U.S. domestic efforts. Indeed, many of the models for disaster programs in less developed countries were derived from industrialized countries. These lessons, however, represent alternative forms of organizational and managerial performance that may be useful in assessing and improving domestic disaster actions.

The most important element in transferring lessons to domestic programs, a transfer mechanism, is missing. Neither lessons derived from institutional adaptations in developing countries nor from the international operations of OFDA will be readily incorporated into domestic programs without an explicit transfer mechanism. Even the aggregation and evaluation of possible lessons is made difficult by the lack of a systematic overview of all practices in less developed countries which may be applicable to domestic programs.

The first area of possible transferability of lessons involves dealing with the entire hazard lifecycle. The second area is a cluster of 16 topics directed to particular program adaptations and improvements.

THE HAZARD AND DISASTER LIFECYCLES

In the United States, a major emphasis over the years has been response to and recovery from disasters. As a result, deficiencies in mitigation, preparedness, education, training, and warning were, in many ways, "obscured" by our capacity to respond and reconstruct. Poor preparedness was seldom an issue because the U.S. infrastructure is vast and recovery capability abundant. In time of emergency, local capacity is supplemented by that of the State, which can be supplemented by Federal resources. Thus, a strong political system can guarantee the dispersal of an individual community's loss across an entire nation.

Less developed countries often lack both abundant resources and a political system that can assure special consideration for every victim. As a result, less developed countries have turned, in many cases, to impressive education and training in preparedness. The United States is only now recognizing that mitigation and preparedness may be less expensive in the long-run than continued reliance on recovery. A good base of experience in this programmatic approach to predisaster activities lies in the Office of Foreign Disaster Assistance (OFDA) which has, for several years, been directed toward the full lifecycle of hazards.

In dealing with disasters and their impact on populations and property, emergency response to the event itself is increasingly seen as insufficient and a misuse of scarce and valuable resources. To simply deliver goods to disaster-stricken people

fails to recognize that the hazard exists long before the disaster strikes and that it will recur unless things change. An exclusive focus on the emergency phase ignores contributions that can be made to the mitigation or avoidance of the hazard. Figure 1 suggests one approach to illustrating the events in the lifecycle of a hazard. Emergency relief and short-term recovery are only small, but important, parts of the hazard lifecycle. Recognition of the other events in the lifecycle (such as steps 9 through 15) can result in positive benefits for populations living in risk areas. Figure 2 presents the OFDA image of the disaster cycle.

According to a document prepared by OFDA:

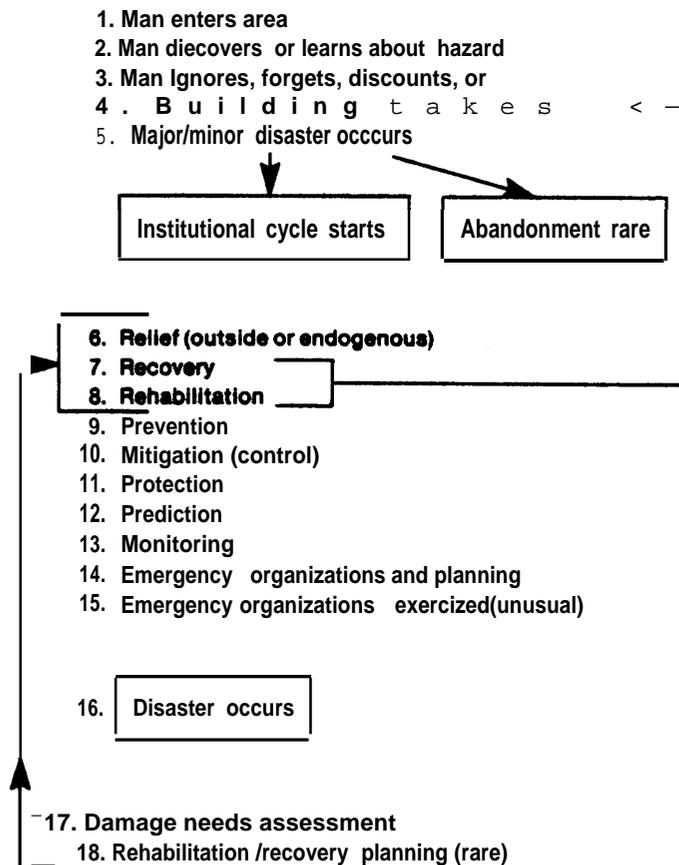
From the beginning, responsibilities of the AID Disaster Relief Coordinator were recognized as being twofold: 1) coordination and direction of the U.S. Government response to foreign disaster emergency requirements; and 2) development, in advance, of plans and policies for improved preparedness for foreign disaster emergencies, both in

the United States and in foreign disaster-prone countries.¹

Even with those original intentions, the early emphasis of the Agency for International Development (AID) /OFDA disaster program was directed toward emergency response. As the OFDA officials freely admit, in the early years the limited staff size and the large number of disasters (averaging nearly 50 a year) prevented even a brief look at preparedness and planning.

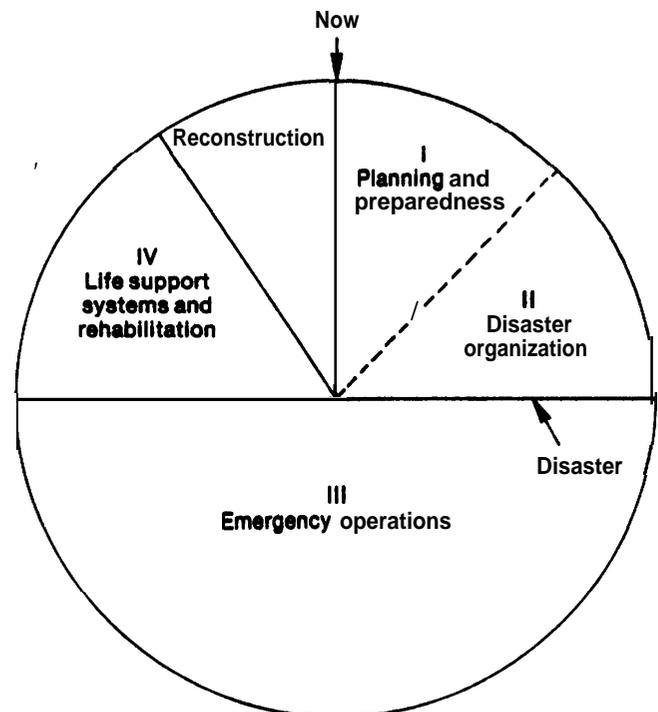
The Disaster Office began to train disaster relief officials from foreign countries in 1967 when a single disaster relief official from Jamaica came to the United States. Six weeks of training with OFDA and the American National Red Cross led to the development of the first International Disaster Preparedness Seminar for foreign officials. Held every year since 1969, the 6-week seminars have involved 132 foreign disaster officials from 48 nations.² Beginning in 1979, a series of regional preparedness seminars have also been held to bet-

Figure 1.-Lifecycle of a Hazard



SOURCE: Office of Technology Assessment

Figure 2.-"The Disaster Cycle"



SOURCE: *Instruction Guidelines, International Disaster Preparedness Seminar*. OFDA Disaster Technical Assistance Branch, Agency for International Development (Washington, D. C., 1977), p. iv.

ter address specific common problems of a small group of neighboring nations. The foci o these seminars are to encourage countries to p pare, improve, and test national disaster plans; to make hazard and disaster resource analyses; to reate permanent disaster organizations; to en; national disaster emergency laws; and to mantain systematic working relationships with Voluntary agencies.

The Instruction Guidelines for the 1977 ainar explicitly described "The Disaster Cycle" IS including five stages. Beginning with "Nov ' the foreign disaster relief officials were told the steps in the cycle precede disaster "Planni : two Preparedness" and "Disaster Organization : and The disaster impact signals the beginning of s ge 3; "Emergency Operations," followed by stag four, "Life Support Systems and Rehabilitation and finally, "Reconstruction."³ The seminars fo is on the two stages prior to disaster.

In addition to the Disaster Prepal dness Seminar, OFDA offers direct technical ass :ance to disaster-prone countries. Personnel of FDA n ac spend periods of time in the countries, of 'part accompanied by experts detailed from other con- ducting hazards analyses, training program , and organization planning sessions with the host governments.

U.S. disaster programs also attempt tore gnize and cope with the whole lifecycle of intern ional hazards by the application of science and hno- ogy. Beginning in 1974, efforts were made to ncor- porate scientific and technical knowledge clud- ing hazard mitigation and preparedness, saster prediction and warning, and weather stems ntly, research into the disaster relief process. Curren , par several areas have the attention of the Offi ticularly satellites and high-level aerial ph ogra- phy for hazard monitoring and damage sses- ment, predictive early warning, and corer nica- tions systems.⁵

The National Academy of Sciences (NAS Com- mittee endorsed the idea of disaster prepa dness but strongly emphasized the use of availab local resources and capabilities rather than hig y de-

³*Instruction Guidelines*, International Disaster Pre redness Seminar, Office of Foreign Disaster Assistance, U. Agency for International Development, Washington, D.C..D.), p. IV.

⁴Ibid., p. 11.

⁵Office of Foreign Disaster Assistance, op. cit., p.

veloped science and technology for predisaster ef- forts. The Committee wrote:

The rationale for these predisaster preventive, pro- tective, and preparedness measures is straightfor- ward. Disaster relief officials assume that the degree of disruption to a society caused by a disaster will largely be determined by the extent to which the society has developed realistic expectations about the problems to be confronted. If the continuity of social life is to be maintained with minimal interrup- tion, a society should be organized to anticipate the probable kinds of disaster it faces and take ade- quate preparatory measures prior to their occur- rence.⁶

In summary, the U.S. international disaster as- sistance program was, for many years, concerned primarily about immediate postdisaster emergency relief. In recent years, with the growing recogni- tion of the repetitive patterns of natural disasters and the inherently common components of most emergency conditions, increasing attention has been given to the preimpact programs of preven- tion, mitigation, warning, and preparedness plan- ning. These programs offer considerable benefit in reducing the net costs of disaster. The interna- tional disaster program has accepted the tradeoff of direct investment in predisaster efforts. The huge direct costs of relief and the indirect costs of inflation and loca[economic depression are likely therefore to be reduced. U.S. domestic disaster policy makers may profitably examine the outcome of these decisions in the future.

SPECIFIC PROGRAM AREAS

There are 16 program areas where experiences in developing country disasters may pro~~e beneficial to U.S. domestic disaster programs. Since no read- ily available technique exists for the transfer of les- sons into U.S. programs, of learning from develop- ing country disasters has merit.

The 16 program areas are:

- Planning
- Building standards
- Self-help for victims
- Emergency organizations

⁶ *4 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. 3.

- Infrequent disasters
- Surveillance
- Practice and training
- Information
- Evaluation
- Contingency funding
- Voluntary agencies
- Stockpiling
- Transportation
- Public contributions
- Reserve cadre
- Adaptation during system failure

Planning

There is **lack of** coordination between disaster plans and State development plans according to a recent study conducted by the National Governors' Association. While some States, notably Hawaii, are advanced in this notion, in general, development planners see few links between disaster emergency planning and community development plans.⁷ As a result of this relative isolation of the two plans, few States have more than a cursory overview of the hazards of development.

The situation in planning institutions in the less developed countries is sometimes different, not by considered effort but because of scarcity of human resources. The developing countries cannot afford separate planning; development and emergency plans are often undertaken by the same organization. Developing countries, therefore, offer a body of experience on the coordination of planning which could be examined to determine the desirability of such integration for U.S. planning.

Building Standards

In several recent earthquakes (Italy, Romania, and Guatemala), National Bureau of Standards (NBS) teams have traveled to the disaster site to conduct research and offer assistance. New reconstruction techniques have sometimes been experimented with, thus adding to the body of knowledge available to U.S. disaster operations. For example, following the Romania earthquake the NBS Center for Building Technology sent a team that was able to observe the use of a plastic adhesive injected into unstable walls. This successful innovation will almost certainly be integrated into U.S. planning.

⁷*Final Report* (Washington, D. C.: National Governors' Association, Emergency Preparedness Project, 1978), p. 79.

Self-Help for Victims

Compared to postdisaster behavior in the developing countries, self-help is often minimized in U.S. disaster recovery efforts.

For instance, both domestic and foreign studies have shown that people want houses rebuilt as rapidly as possible and will do extensive work themselves if provided with proper materials. People prefer advice and supplies to extensive mass shelter or temporary housing, people want advice and supplies. Such supplies are particularly important since they can help prevent further damage to structures weakened by the disaster or exposed to the elements. In international disasters, providing steel roof sheeting contributes to this end. While the solution internationally may not be completely suited to the United States, the enhancement of the self-help concept deserves further review as an aid in postdisaster recovery from domestic catastrophes.

Emergency Organizations

In the United States, five types of organizations have responsibility for State emergency operations: (a) Governor's office, (b) department in the executive branch, (c) civil defense council, (d) Adjutant General, and (e) State police.⁸

The international environment offers an observatory in which to examine additional alternative organizational structures and interorganizational relationships that can benefit domestic as well as international disaster efforts. The international disaster arena permits the development of a comparative body of knowledge and a frame of reference against which domestic organizations can be measured. This body of knowledge can highlight both similarities and differences in human and organizational response and suggest other effective organizational forms.

Infrequent Disasters

Terrorism, civil strife, and kidnapping are examples of events from which U.S. cooperation in international disasters can provide benefits in knowledge for domestic disaster policy. In such events, developing countries offer lessons about response because, from an organizational view these events occur so infrequently in the United States as to lack response precedents.

⁸*Ibid.* p. 8.

Testing techniques of preparedness and hazard reduction in this world laboratory also offer potential benefits to the United States. Long-range hazard mitigation efforts can be measured in terms of alternative organizational structures, effectiveness of implementation, and utility in actually lessening damage to people and property.

Scientific research, hypothesis testing, and the development of monitoring instrumentation for several types of hazards would be more difficult without the opportunities presented by U.S. activities in developing countries. The research opportunities on earthquakes in this country are supplemented by foreign disaster studies. U.S. Geological Survey (USGS) teams have engaged in close scientific exchange on recent earthquake sites in Guatemala, Nicaragua, Italy, and Romania. In Romania, USGS actively engaged in warning of the possibility of a second quake based on several previous incidents of "double" earthquakes (a second strike occurring shortly after the first) in that region. Such exchanges of information benefit both U.S. and foreign country preparedness programs.

Surveillance

Any form of warning system incorporating the observation of events with remote-sensing satellites or aircraft would be most effective when international in scope, because weather patterns, earthquake faults, and ocean currents are global. Similarly, the effective utilization of such technologies as satellite photography, computer models, and long-range forecasting necessitates close international cooperation. Lessons learned from U.S. involvement in helping other countries build a data base will enhance the ability to interpret domestic long-range trends. This is especially true in research on climate change. Only when meteorological organizations in all countries can provide valid input to scientific research will clear interpretations of future weather patterns be possible. The U.S. role in developing such expertise will, in the long run, benefit U.S. domestic disaster programs.

Training and Practice

Linking preparedness and response through exercises, practice, or training enables organizations to measure performance and engage in corrective measures. Disasters in developing countries offer two contributions to domestic training and exercises.

First, several countries appear to be more adept at training their people in effective disaster responses. For example, while we have a relatively sophisticated weather prediction system, the associated organizational system for implementing disaster warnings in many areas is inadequate. Public education and training programs for disaster preparedness in the United States suggest that there may be lessons to learn from how developing countries organize for preparedness and response. Because some of the nations from which lessons might be transferred have dictatorial or semidictatorial forms of government, with concomitantly greater ease in mobilizing social control mechanisms, these education and training techniques must be examined cautiously.

Second, disasters in the developing countries offer an opportunity for U.S. organizations to utilize some functions that are infrequently called into action. Specifically, voluntary organization fund-raising, mass food and clothing collection, coordination among organizations, and transportation of large volumes of material would occur only in a large domestic mass emergency. However, these efforts can be practiced as frequently as desired in support of foreign disasters.

Information

No cohesive disaster information coordination system currently exists in the United States, although the establishment of the Federal Emergency Management Agency in 1979 is expected to improve existing data bases in mitigation, preparedness, and response.

Two types of information would be useful in such a system: (1) real-time disaster monitoring and (2) applications of research. The former category involves monitoring hazards and disaster-response resources. A proposal of the U. N'. Association to create a food-monitoring system for the developing countries might offer models for U.S. development of a domestic information system.⁹ Research applications suggest an information clearinghouse that specializes in coordination of disaster-related research and engages in the translation of such research into operationally useful information for disaster managers.

⁹*Acts of Nature, Acts of Man: The Global Response to Natural Disasters* (New York: U.N. Association. Policy Studies Panel on International Disaster Assistance, 1977), pp. 67-68.

Evaluation

Effective emergency operations are vital to success in delivering disaster-related services to victims. The evaluation of experiences in disasters in the developing countries can contribute to the development of effective procedures which, in turn, can be applied in the response to domestic disasters.

The Office of Foreign Disaster Assistance has recently developed an integrated evaluation system called "Lessons Learned." The system employs a set of evaluative criteria to identify performance characteristics and recommendations for future improvement of disaster response. The use of this computer-based information permits the analysis of consistent areas of successful and unsuccessful performance across several disasters. These findings can be incorporated into management decisions instantaneously. Both the "Lessons Learned" system design and the substantive findings of the performance evaluations should prove of interest and benefit to domestic disaster professionals.

Contingency Funding

The power to "mobilize contingency funds in a fast, efficient manner" is of such importance, according to a recent study by the National Governors' Association, that the report recommended each Governor have such authority.¹⁰ In disaster assistance to developing countries, each U.S. Ambassador has a contingency account of \$25,000 available for distribution within the host country immediately upon the declaration of disaster. Thus, there is a body of experience about the utilization of these funds in disaster response. Despite the widely divergent sums of money likely to be involved domestically, the methods used and results of foreign contingency funding could provide models for applications in the United States.

Voluntary Agencies

Voluntary agencies with ongoing programs in the less developed countries are an effective channel for disaster assistance by international donors. In the United States a similar, if not more extensive, voluntary infrastructure exists in most communities. The domestic attitude, it seems, is to

make use of these capabilities during the emergency period, but use them only minimally during recovery and reconstruction.

Internationally, in the India cyclone of 1977, OFDA channeled all aid through existing voluntary agency programs, making them responsible for meeting eligibility, budgeting, and accounting requirements. Effective contributions were made to meeting victims' needs with speed, efficiency, and administrative economy. Domestically, a contrary example exists. Disaster officials reconstructing after the eastern Kentucky floods of 1977 found little use for voluntary agencies with established links to the affected communities. Federal agencies set up one-stop centers, requiring the relocation of already operating service organizations and the transportation of victims. Furthermore, the Federal agencies monitored all activities themselves, maintaining some presence for nearly 1 year.

The comparative capabilities in relief and reconstruction management of voluntary organizations must, of course, be measured in individual cases. However, the experience of international disaster assistance with third-party relief management may be instructive domestically.

Stockpiling

The experience of OFDA in the development of its four regional stockpiles may offer benefits for domestic logistical systems. Problems of expiration dates on drugs as well as material maintenance have been addressed through a computerized accounting system. Similarly, experience in frequency of turnover and quantity of items may be of use in domestic preparedness.

Transportation

Experience with various forms of transport in emergencies is held both domestically and in developing countries. The individual domestic city or locality, however, probably has limited experience with transport compared to that gained across the whole spectrum of activities in developing country disasters. For example, experience with several different types of helicopters in the Guatemala earthquake has led the Department of Defense to recommend that OH-58 helicopters be used in future disaster relief operations rather than the UH-1H helicopter because of maneuverability

¹⁰Final Report, op. cit., p. 212.

and economy.¹¹ An inventory of similar experiences in developing countries might prove useful in selecting appropriate military and other transport support in domestic emergencies.

Reserve Cadre

Full-time staff for emergency management can be effectively supplemented with a trained reserve cadre, as shown in the experience of several donor countries, including the United States. These reserve emergency officials are drawn from subject or geographic area divisions. Thus, their specialized knowledge plus disaster-related training offer useful complements to professional disaster staffs. State emergency offices across the country might review the experience of OFDA with reserve cadres to determine the benefits to be derived from that approach. If found useful, the cadre training program of OFDA might be an adaptable source of training methods and materials.

Public Contributions

A well-publicized disaster in the developing countries often initiates an overwhelming response from the American people. During relief operations following Hurricane Fifi's devastation of Honduras in 1974, OFDA developed a plan for addressing the problem of indiscriminate donations. This plan involves appointment by each State Governor of a foreign disaster assistance coordinator who is responsible for disseminating news of foreign disasters. If the disaster-stricken country has not requested some form of material aid, the foreign disaster assistance coordinators encourage the public to give cash donations to voluntary agencies. If specific material aid is requested, the State coordinators join with the Red Cross, other voluntary agencies, and the Defense Civil Preparedness Agency in collection, screening, and shipment of supplies from communities throughout the United States. This procedure has been used following the Guatemala and Italian earthquakes of 1976 and the Mexican hurricane of the same year.

This system is readily transferable to domestic disaster operations because in domestic disasters

the same tendency to ship used clothing and other materials must be combated.

Adaptation During System Failure

In the United States, a considerable proportion of emergency-response capabilities is dependent upon technical systems which are themselves, vulnerable to disasters. For example, epidemiological surveillance techniques rely on computerized information systems. In the event of an emergency, technological systems may be unavailable. Domestic response personnel may then experience conditions not unlike daily life in less developed countries.

Institutional adaptations to a limited resource base may yield transferable lessons to the United States in the event of technological systems failures. For instance, in a recent epidemic in Zaire, an international epidemiological surveillance team developed effective surveillance methods adapted to a rural village environment. Those methods might well prove a useful backup in domestic instances where computer facilities are unavailable. Similar examples of forced resourcefulness are likely to be available for consideration in alternative forms of domestic preparedness.

CONCLUSION

Taking advantage of the available lessons from U.S. participation in developing country disasters requires that two organizational Requirements be addressed.

First, a body of information must be organized in a framework which seeks transferable lessons. This should include the system; evaluation of existing studies plus original research, as necessary.

Second, a dissemination mechanism is necessary that creates, out of cross-national research, principles, practices, and suggestions applicable to U.S. disaster programs. This mechanism should produce the results of research in a format specifically directed to disaster planners and operational personnel.

This combination of tailored research and problem-oriented diffusion of adaptations and innovations could materially contribute to the improvement of U.S. domestic disaster programs.

¹¹ *Guatemala Disaster Relief Operations—After Action Report* (Washington, D. C.: Department of Defense, Apr. 23, 1976), p. 23.