

WORKING P A P E R

Models of Relief

Learning from Exemplary Practices in International Disaster Management

MELINDA MOORE, HORACIO R. TRUJILLO,
BROOKE K. STEARNS, RICARDO BASURTO-
DÁVILA, AND DAVID EVANS

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SUMMARY

Hurricane Katrina, which struck the U.S. Gulf Coast in August 2005, was the most destructive and costly natural disaster in U.S. history. While shortcomings in disaster preparedness and response associated with Hurricane Katrina were numerous and have been reported extensively, they more broadly illustrate areas needing improvement in this country's overall disaster management system.

Natural disasters are a common occurrence in the United States. Between 1974 and 2004, an average of 38 federally declared major disasters occurred annually. While the number of such disasters has been relatively stable and the number of disaster-related deaths has decreased in recent decades, the associated economic losses have increased exponentially, from less than \$25 billion over earlier five-year periods going back to the 1950s, to nearly \$100 billion over the five-year period from 1992-1996. In contrast, the occurrence of natural disasters worldwide has been increasing: from an average of 100 per year in 1975-1980 to more than 400 per year in 2000-2005. In parallel, the number of persons affected by disasters has increased from approximately 160 million per year from 1985-1995 to an average of nearly 260 million per year in 1995-2005, and economic losses due to natural disasters have increased as well, from \$38 billion during the 1950s to \$660 billion during the 1990s. Thus, the sheer volume and human and economic impact of natural disasters worldwide offered a substantial body of experience warranting further examination.

This study sought information not traditionally considered by U.S. policymakers: disaster experiences from the international community. It began with examination of the U.S. response to Hurricane Katrina to identify areas that were problematic. These areas in turn served as a basis for identifying and analyzing exemplary practices from disaster management in other countries. Without purporting to provide exhaustive documentation of all events related to Hurricane Katrina, the case study presented in this report details the circumstances and activities, with a focus on New Orleans. The following areas were identified as problematic:

Prevention and preparedness

- *Coordination/management:* Lack of coordination between state and local emergency plans posed challenges.
- *Planning and exercises:* Despite annual exercises, Louisiana's planning for a massive storm had not been completed, and communities were not sufficiently prepared.
- *Early warning:* Advance warnings from the National Weather Service of a severe advancing storm did not prompt commensurate action by local populations.
- *Evacuation:* Evacuation plans were not consistent with the realities of the local population, e.g., a high proportion of the population did not have access to personal vehicles for evacuation, as called for in the plans.
- *Shelters:* Planning included community registers of evacuation shelters, but no corresponding state or national registers; also, New Orleans did not release information on local shelters to the public in advance of hurricane landfall.
- *Health:* Poor health planning ultimately led to critical delays, shortages in resources and flawed emergency protocols in the health and medical response.

Response

- *Coordination/management:* The FEMA response was delayed for administrative and logistical reasons and to allow for completion of worker training; FEMA administrative procedures delayed or even precluded a good deal of external assistance.
- *Communications:* Among the communications problems experienced during the Hurricane Katrina response, the generator for the New Orleans emergency communications system was damaged and rendered dysfunctional by the storm, and the batteries of radios used by emergency responders became depleted.
- *Evacuation:* Despite severe storm warnings, New Orleans residents were only *encouraged* to prepare for evacuation rather than actually to evacuate; voluntary evacuation orders came too late, and many residents were unable to respond for numerous reasons including lack of personal or public transportation. Also, despite individual organizations' efforts, evacuee registration

through a central database of displaced persons was delayed for several days.

- *Shelters:* Excessive numbers of persons unable to evacuate safely had to seek refuge in two large “shelters of last resort”, which were unable to meet the needs of vulnerable populations and experienced violence that posed a further security threat.
- *Health:* Healthcare facilities were damaged and became inaccessible and inoperable; some external medical assistance went unused.
- *Emergency supplies:* Emergency shelters were not adequately stocked in advance of the storm, and the storm precluded delivery of some supplies afterward.
- *Security and law enforcement:* Local police and National Guard troops were quickly overwhelmed, and external assistance was delayed; detainment facilities for offenders were inadequate or unavailable.
- *Search and rescue:* Coast Guard and National Guard conducted successful efforts, but additional active duty military personnel were not used because their commanders did not approve the rescue missions.

This report is based largely on detailed case studies of thirteen natural disasters in eleven countries around the world. In particular we sought to identify exemplary practices in areas there were problematic in the response to Hurricane Katrina. However, finding instances of exemplary practice proved difficult. Most written reports tend to document negative rather than positive experiences, and virtually none reflect rigorous evaluations that link response actions to outcomes or impact, we developed our own criteria for selecting the exemplary practices reported here. These positive experiences were selected because of potential applications to U.S. preparedness for future disasters. In evaluating cases to include as examples of exemplary practice, we sought disaster management activities, at any phase of the disaster management cycle (which includes prevention and preparedness, response, recovery and redevelopment):

- related to particular weaknesses identified in the Hurricane Katrina response;

- that were innovative - new or creative in some way - whether in relation to the affected country's previous policies or in relation to commonly accepted international practices;
- for which there was evidence that these practices resulted in a reduction in the losses that would have been expected from similar disasters; and/or
- that reflected general practices or principles subsequently validated by recognized disaster management experts and considered to be potentially replicable in other settings.

The thirteen international case studies reflect disasters that caused considerable economic and human loss across a broad range of countries. Some of them provided a robust range of exemplary practices, e.g., Cuba, Mozambique and the Philippines, while others provided fewer or only a single relevant exemplary practice, e.g., Mexico and Vietnam (see table S.1). Though each disaster is unique and country contexts vary considerably, systematic examination of positive experiences, principles and insights from international disaster management offers a fresh avenue to help enrich the body of information from which U.S. policymakers can draw as they seek to improve this country's disaster management.

Table S.1 Summary of Exemplary Practices Identified, by Country

Location	Type	Year/s	Prevention/Preparedness	Response	Recovery and Redevelopment
Cuba	Hurricane	2001	Early warning; planning; exercising; community preparedness	Coordination/management; evacuation; shelter; security; health	Community involvement
Mozambique	Floods	2000, 2001	Early warning; regional coordination; planning; exercising; community preparedness	Evacuation; search and rescue; coordination	Development orientation
Philippines	Volcanic eruption	1991	Early warning; early evacuation; regular public warnings and public awareness building	Health (surveillance and disease control)	
Iran	Earthquake	2003		International and local response coordination; health (surveillance and needs assessment); search and rescue	Community involvement (local liaisons, communications)
Bangladesh	Flood	1998	Orientation; social and economic development	Coordination/management	Development orientation; private sector
Indian Ocean countries	Tsunami	2004	Local disaster management capacity building	Private sector involvement in logistics	
Honduras	Hurricane	1998	Local risk management capacity		Decentralization, simplification, and acceleration of project implementation; community involvement; development orientation
India	Earthquake	2001			Coordination/management; integrated information systems; disaster impact mapping; community empowerment; housing; community training
Vietnam	Floods	1998, 1999			Housing
Mexico	Earthquake	1985			Infrastructure; community involvement; rent payment assistance; rapid completion
Czech Republic	Floods	1997, 2002	Early warning; emergency medical care	Coordination	
Indonesia	Landslides	2002-2003	Early warning		
Vietnam	Typhoon	2005	Prevention/protection		