



help strengthen local organizational and decision-making capacity. ●●● Local leaders too often fail to take advantage of the recovery period to reshape their devastated communities to withstand future events. Most local disaster plans need to be extended not only to explicitly address recovery and reconstruction but to identify opportunities for rebuilding in safer ways and in safer places. ●●● Fortunately, revisions to disaster legislation in the last several years have allowed a greater percentage of federal relief monies to fund mitigation programs. Pre-disaster planning for post-disaster recovery is vital to communities' ability to become disaster resilient.



A New Approach to Hazards

Researchers and practitioners in the hazards community need to shift their strategy to cope with the complex factors that contribute to disasters in today's—and especially tomorrow's—world. Here are the main guidelines for improving our ability to mitigate hazards.

- **Adopt a global systems perspective.** Rather than resulting from surprise environmental events, disasters arise from the interactions among the earth's physical systems, its human systems, and its built infrastructure. A broad view that encompasses all three of these dynamic systems and interactions among them can enable professionals to find better solutions.
- **Accept responsibility for hazards and disasters.** Human beings—not nature—are the cause of disaster losses, which stem from choices about where and how human development will proceed. Nor is there a final solution to natural hazards, since technology cannot make the world safe from ALL the forces of nature.
- **Anticipate ambiguity and change.** The view that hazards are relatively static has led to the false conclusion that any mitigation effort is desirable and will—in some vague way—reduce the grand total of future losses. In reality, change can occur quickly and nonlinearly. Human adaptation to hazards must become as dynamic as the problems presented by hazards themselves.
- **Reject short-term thinking.** Mitigation as frequently conceived is too short-sighted. In general, people have a cultural and economic predisposition to think primarily in the short term. Sustainable mitigation will require a longer-term view that takes into account the overall effect of mitigation efforts on this and future generations.
- **Account for social forces.** Societal factors, such as how people view both hazards and mitigation efforts or how the free market operates, play a critical role in determining which steps are actually taken, which are overlooked, and thus the extent of future disaster losses. Because such social forces are now known to be much more powerful than disaster specialists previously thought, growing understanding of physical systems and improved technology cannot suffice. To effectively address natural hazards, mitigation must become a basic social value.
- **Embrace sustainable development principles.** Disasters are more likely where unsustainable development occurs, and the converse is also true: disasters hinder movement toward sustainability because, for example, they degrade the environment and undercut the quality of life. Sustainable mitigation activities should strengthen a community's social, economic, and environmental resiliency, and vice versa.

PROVIDE COMPREHENSIVE EDUCATION AND TRAINING. Today hazard managers are being called upon to tackle problems they have never before confronted, such as understanding complex physical and social systems, conducting sophisticated cost-benefit analyses, and offering long-term solutions. Education in hazard mitigation and preparedness should therefore expand to include interdisciplinary and holistic degree programs. Members of the higher education community will have to invent university-based programs that move away from traditional disciplines toward interdisciplinary education that solves the real-world problems entailed in linking hazards and sustainability. This will require not only new degree programs but also changes in the way institutions of higher education reward faculty, who now are encouraged to do theoretical work.

MEASURE PROGRESS. Baselines for measuring sustainability should be established now so the nation can gauge future progress. Interim goals for mitigation and other aspects of managing hazards should be set, and progress in reaching those goals regularly evaluated. This effort will require determining how to apply criteria such as disaster resiliency, environmental quality, intra- and inter-generational equity, quality of life, and economic vitality to the plans and programs of local communities.

Also important is evaluating hazard-mitigation efforts already in place before taking further steps in the same direction. For example, the National Flood Insurance Program, which combines insurance, incentives, and land-use and building standards, has existed for 30 years, yet its effectiveness has never been thoroughly appraised.

Each disaster yields new knowledge relevant to hazard mitigation and disaster response and recovery, yet no entity collects this information systematically, synthesizes it into a coherent body of knowledge, and evaluates the nation's progress in putting knowledge into practice. Systematic post-disaster audits, called for in the 1975 assessment by White and Haas, are still needed.

SHARE KNOWLEDGE INTERNATIONALLY. The United States must share knowledge and technology related to sustainable hazard mitigation with other nations, and be willing to learn from those nations as well. Both here and abroad, disaster experts also need to collaborate with development

experts to address the root causes of vulnerability to hazards, including overgrazing, deforestation, poverty, and unplanned development. Disaster reduction should be an inherent part of everyday development processes, and international development projects must consider vulnerability to disaster.

THE KEY ROLE OF THE HAZARDS COMMUNITY

To support sustainable hazard mitigation, researchers and practitioners need to ask new questions as well as continue to investigate traditional topics. Important efforts will include interdisciplinary research and education, and the development of local hazard assessments, computer-generated decision-making aids, and holistic government policies.

Future work must also focus on techniques for enlisting public and governmental support for making sustainable hazard mitigation a fundamental social value. Members of the hazards community will play a critical role in initiating the urgently needed nationwide conversation on attaining that goal.



ACKNOWLEDGMENTS

This work to summarize knowledge and catalogue research and policy needs related to hazards and disasters in the United States was funded by the National Science Foundation under Grant Number CMS93-12647, with supporting contributions from the Federal Emergency Management Agency, the U.S. Environmental Protection Agency, the U.S. Forest Service, and the U.S. Geological Survey. The support of these agencies is greatly appreciated; however, only the author is responsible for the information, analyses, and recommendations contained in this summary.

Special appreciation is extended to the following people who served as members of the project's Advisory Panel:

William A. Anderson, National Science Foundation
Michael Armstrong, Federal Emergency Management Agency
Riley Chung, National Institute of Standards and Technology
Caroline Clarke, National Research Council
James F. Davis, California Division of Mines and Geology
Walter Hays, U.S. Geological Survey
Edward J. Hecker, U.S. Army Corps of Engineers
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Randall Updike, U.S. Geological Survey
Gilbert F. White, University of Colorado at Boulder
Arthur Zeisel, Federal Emergency Management Agency

Over a score of professionals reviewed the manuscript drafts of the book that this document summarizes. The greatest appreciation is extended to the reviewers for their insightful critiques and recommendations. Warm appreciation also goes to David Morton, who lent his patience and willingness to serve as a personal librarian to every contributor to the project. Finally, Jacquelyn L. Monday edited the manuscript drafts without complaint—a Herculean effort. Jacki, you will always have my deepest appreciation for your excellent work as an editor, and for your substantive contributions to the text as it emerged over several drafts. Mostly, thank you for taking on this project as your own and for your relentless commitment to it.

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