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Mitigating Natural Disasters

Frank Press and Robert M. Hamilton

Natural disasters have caused enormous losses in many countries and have set back economic progress in developing countries by years. The future looks even worse, as populations in many parts of the world migrate into hazard-prone regions and into major urban centers, which are particularly vulnerable because of their dependence on complex infrastructures. These exposed situations motivated international organizations of scientists and engineers to focus world attention on the threat and the opportunities to avert losses. They petitioned the United Nations (U.N.) to declare the 1990s the International Decade for Natural Disaster Reduction (IDNDR). As the Decade nears its end, it is appropriate to take stock of what has been accomplished and to chart the most productive future course.

We must address the scourge of natural disasters.

Introducing scientific and technological advances into disaster management is potentially of great value. Improved early warning systems to move people out of harm's way, sound land use to avoid hazards, and construction practices to better withstand loads imposed by hazards are examples of more effective mitigation strategies based on new knowledge. Implementation of mitigation requires raising public awareness of the threat that hazards pose, the opportunities to reduce human losses, and the cost-effectiveness of mitigation measures. Only in this way can we develop the political willingness to mobilize the necessary resources.

Implementing the IDNDR through the U.N. system was a difficult task. Large-scale human migrations caused by the Gulf War and conflicts in central Africa during the 1990s absorbed enormous resources that might otherwise have been used to prevent emergencies, including those caused by natural hazards. Despite these difficulties, as the Decade progressed, the importance of mitigation became more accepted. Now, in looking beyond the Decade, several organizations in the U.N. system, including the United Nations Educational, Scientific, and Cultural Organization; the World Meteorological Organization; the World Health Organization; and the United Nations Development Program are planning substantial new and continuing activities.

In the United States, although high-level leadership and significant new resources were not provided for the IDNDR effort, substantial progress toward mitigation has been achieved on many fronts. Most notably, the Federal Emergency Management Agency (FEMA) raised mitigation to be of equal priority with response and recovery and developed a National Mitigation Strategy. In the private sector, to cite just one example, the Institute for Business and Home Safety, an insurance industry–backed group, promoted development of hail-resistant roofing materials and better building codes and organized community demonstration projects. Private and public structures increasingly incorporate seismic- or wind-resistant design features. These and other activities indicate the growing importance accorded to disaster mitigation in the United States, although rapidly increasing vulnerability may be outpacing these efforts. Population is migrating toward the earthquake-prone Pacific coast and the hurricane-prone Atlantic and Gulf coasts. In Florida, 80% of the population lives within 35 kilometers of the coast.

The growing impact of natural disasters demonstrates the need to further advance mitigation through well-coordinated activities. This will require a U.N. oversight unit to coordinate activities in the program areas of (i) advancing the frontiers of hazard mitigation science and technology; (ii) implementing programs of education, training, and technology transfer; (iii) monitoring hazards phenomena and providing early warning where possible; and (iv) promoting and implementing mitigation as an integral part of economic development. A measure of the progress of civilization in the next millennium will be the degree to which the world community uses science and technology to improve the quality of life of people everywhere. Addressing the scourge of natural disasters that has afflicted humankind for countless generations is a worthy goal for a new era.

F. Press proposed the IDNDR concept in 1984 while president of the National Academy of Sciences and is now at The Washington Advisory Group (e-mail: fpress@theadvisorygroup.com). R. M. Hamilton, who is executive director of the Commission on Geosciences, Environment and Resources of the National Research Council, serves as chair of the IDNDR Scientific and Technical Committee (e-mail: bhamilton@nas.edu).