Managing Natural Disasters and the Environment

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Foreword

Wilfried P. Thalwitz

The United Nations declared the 1990s the International Decade for Natural Disaster Reduction. The Ad Hoc Group of Experts for the IDNDR saw the Decade as a moral imperative and urged the application of scientific and technical knowledge to alleviate human suffering and improve economic security. Therefore, the World Bank has assembled for this important Colloquium on Disasters and the Environment some of the brightest minds in the fields of development and environmental and disaster management

Why is this happening in the Bank? What do natural disasters have to do with an institution that has rather limited involvement in financing relief measures and little technical capability for predicting disasters? The connection is development itself. Poverty in the developing countries limits their resilience in the face of disaster. We have only to remember TV images of the earthquake victims in Iran, flood victims in Bangladesh, and, more vivid still, the emaciated victims of recurrent drought in the Sahel. In all these disasters, many more people died than needed to — and they died because of their poverty. They died for lack of transport, for lack of hospitals, for lack of shelter, for lack of food — they died for lack of means, generally.

You could express it another way: poverty keeps the insurance premium from being paid. There is no risk reduction without development — in the sense of growth and the accumulation of wealth, the ability to save and invest, the creation of functioning institutions, and investments in human capital. Development enables ex-ante precautionary measures to be taken that are an important application and expression of wealth — and makes it possible to cushion the impact ex post, when preventive measures are inadequate.

But development is not enough. Development is a necessary but not a sufficient condition for safety. And one purpose of this colloquium is to focus on ways in which the quality of development must be improved — to examine the important feedback loop between growth and the resource base. We recall that the United States allowed drought conditions — the Oklahoma "dustbowl" of the 1930s — to develop even though the agricultural practices of the time were known to be disturbing the American Prairie's delicate ecological balance. The small farmers lost their land to produce wealth for others.

Even humanitarianism is dangerous when it ignores long-term effects on the ecology. After the first drought in the Sahel, for example, many European agencies rushed to dig wells that would bring water. Cattle herds grew in number, the cattle devoured all available groundcover, and the water table dropped rapidly — because there was nothing to absorb even the little rain that did fall. The herders were worse off than they had been before. All the traditions that had seen nomadic families of the desert through in the past were of no use, the land had lost the ability to sustain animals because of the tube wells.

In short, development is needed to increase

developing nations' resilience in the face of disaster, but development efforts must not result in destruction of the natural resource base.

International efforts to combat global warming and to cooperate on the use of the seas are two components in a major change in resource use. We need to create a fund for poor countries so they can forgo the use of their resources in the short run — as called for in the Montreal Protocol and the Global Environmental Facility. Too often, costs fall on the poor in developing countries while benefits accrue to other, better-off countries

We must also increase the capacity for scientific research. We can never reach the level of precision with data, or the security of prediction, that an insurance company is capable of — but we must improve our capabilities for measuring the risk of disaster. Better data on risk will allow us to develop policy and incentives to channel the use of our natural resource base in more benign ways. How we use these environmental assets has an impact on the entire world. We must understand the interconnectedness of development and the management of disasters and the environment.

Editors' introduction

The purpose of this volume is to explore the relationship of environmental degradation and vulnerability to disaster and their combined effects on both natural and man-made habitats In the past three decades, the frequency of natural disasters has increased and the world has become increasingly aware of the relationship between the declining quality of the earth's environment and the frequency and severity of earthly catastrophes.

On June 27-28, 1990, the World Bank sponsored a colloquium in Washington, D.C., to promote the exchange of experiences of and ideas about the environment and disaster management. The colloquium was organized by the Environmental Policy and Research Division of the Bank's Environment Department in collaboration with the Agriculture and Rural Development Division of the Economic Development Institute and the Training Division of the Personnel Operations Department

The colloquium was attended by about 170 people in a variety of agencies and institutions dealing with the environment and disaster management The papers gathered here represent the concerns expressed at the colloquium and some of the lessons shared there about how to improve our management of disasters and the environment through a better understanding of the important relationship between them.

The colloquium was held at the beginning of the International Decade for Natural Disaster Reduction (IDNDR), a time of great concern about reducing environmental degradation and preventing and mitigating disasters. On December 11, 1988, the United Nations designated the 1990s the IDNDR (through Resolution 42/169) in an effort to reduce the impact of disasters on development. The goals of the Decade are to:

- Improve each country's ability to mitigate the effects of natural disasters.
- Devise guidelines and strategies for applying existing knowledge.
- Foster scientific and engineering endeavors to reduce loss of life and property.
- Disseminate existing and new information about the assessment, prediction, prevention, and mitigation of natural disasters
- Promote programs of technical assistance and technology transfer, demonstration projects, and educating and training tailored to specific hazards and locations.

The organization of this volume

The contributions in this volume have been grouped around four main topics strategic issues, development (from vulnerability to resilience), risk management, and the coordination of efforts to reduce vulnerability to disaster.

Papers in the first section examine the implications of strategic global, systemic, and survival issues. The magnitude of the problems we face is discussed in papers on the possibility of global climate change and the drastic effects it might have on daily life and national economies. Erik Arrhenius sums up current thinking on the subject: although there is no definite scientific consensus, there is increasing agreement among scientists that the "greenhouse

gases" accumulating in the atmosphere will eventually raise the average worldwide temperature significantly, and such global warming may have profound effects. It is not clear when climate change will occur or what its precise effects will be, but should it take place the consequences could be disastrous. It is clear that we must formulate strategies for confronting potential disaster and measures to reduce our vulnerability to it William Riebsame emphasizes the need for a prudent stance — not waiting for conclusive proof before making adjustments, and making adjustments that expand rather than limit future options for development, particularly low-cost options Mary B. Anderson explains how inefficient and wasteful it is not to allocate resources to disaster prevention, now that all societies are potentially capable of forecasting and preparing for disaster. A case history of a Bank-financed project in Rio de Janeiro after Rio's 1988 floods (by Mohan Munasinghe, Braz Menezes, and Martha Preece) illustrates how such disaster mitigation efforts increase the resilience of disaster-prone areas. Neelam Merani emphasizes the link between natural hazards and environmental degradation and Stephen Rattien highlights efforts in this direction being made by the U.S. Committee on the IDNDR.

Papers in the second section of the book explore the continuum of responses to disaster, from vulnerability to resilience, examining different approaches to ensuring the sustainability of development. Some experts discuss options for prevention and mitigation, including adjustment to floods (Frederick Cuny), and indigenous adaptations to drought, locust infestations, and other disasters in Africa (Thomas Odhiambo and Daniel D.C. Don Nanjira) A case study of Pakistan illustrates how to counter environmental damage through income-generating activities that involve the very refugee communities that caused the damage in the first place Manuel Aguilera Gomez, Michael Cohen, and Jelena Pantelic discuss the important issue of vulnerability in urban settings. Case studies on vulnerability underline the importance of adopting recovery mechanisms that promote the resilience of both man-made environments in Mexico City, Nepal, and China and natural environments in China and Brazil.

The third section focuses on risk management. E L Quarantelli and Parviz Towfighi discuss the differences and similarities between natural hazards and man-made emergencies, and identify generic issues that help define how best to organize institutions to deal with them. Other experts discuss some other approaches to managing risk, through market mechanisms (Andrew Natsios), insurance (Lloyd B. Falck), coastal zone management (John R. Clark), disaster preparedness (Idris Nur), and disaster training (Brian Ward). Hassan Hassan and Wayne Luscombe discuss technologies available for assessing risk. Chen Hong describes how technologies are being used to reduce risk in China.

Section four describes local, national, and international efforts to coordinate prevention, mitigation, and recovery efforts. Jonathan Brown and Mohamed Muhsin highlight efforts to coordinate a flood reconstruction program in Sudan Stephen Bender describes a framework for managing material hazards Seyril Siegel and Peter Witham describe experiences the UN Development Programme has had in reducing vulnerability, Kenzo Toki describes Japan's efforts to help developing countries, and Austin Fernando, Jurg Vittani, and Charles Sykes discuss the contributions of nongovernment organizations. A case study in Taiz illustrates efforts in prevention and mitigation at the municipal level.

To keep the text readable, footnotes and bibliographical references have been kept to a minimum. References for all papers will be found at the back of the book, as will a key to the acronyms and abbreviations that abound in the fields of development and disaster management.

The Colloquium was organized and coordinated by Alcira Kreimer, Senior Environmental Specialist. Michele Zador (consultant) assisted in the organization. Significant support came from Wilfried Thalwitz, V.N. Rajagopalan, Kenneth Piddington, Jeremy Warford, Alberto Harth, Surinder Deol, Nicholas Wallis, and Ernest Hardy. Cheryl Francis, Olivia McNeal, Mariatu Morton, Gail Thoms, and Marietta Visaya graciously provided administrative support. The thoughtful contributions of the panelists and moderators (listed on page 197), and the provocative questions and comments of those attending the conference reflected the uniqueness of the occasion — the convergence of specialists in two traditionally disparate areas, environmental management and natural disaster management. We are indebted to the World Bank for making possible both the con-

ference and this volume based on it.

We are grateful to the authors of the papers in this volume not only for preparing the papers but for submitting to the whittling and other editorial changes needed to convert conference papers into a coherent reflection of the main conference themes. Under Bruce Ross-Larson, the staff of the American Writing Corporation — particularly writer-editor Pat McNees — provided invaluable help in shaping these papers into a book that might be useful for readers who could not attend the conference Alison Strong did a thorough final proofing. Kim Bieler of AWC designed and desktopped the manuscript, but not before its many versions first passed through the hands and word processors of Cheryl Francis and Lydia Maningas.

The papers by Cuny and Quarantelli were not presented at the conference but were prepared for this volume The case studies were prepared as a result of discussions held at the conference. The authors of the case studies — on which Martha Preece worked particularly diligently — gratefully acknowledge the extensive help provided by the following people: Arne Dalfelt (for the case study of the Da Xing An Ling Forest Fire Rehabilitation Project); Christian Delvoie, S. Kowalski, Jaime Larrazabal, Maryvonne Plessis-Fraissard, and Jerry Vargas Ugalde (the La Paz Municipal Development Project), Ricardo Halperin, Felix Jakob, and Tova Solo (the Mexico Housing Reconstruction Project); William Beattie, Daniel Gross, and Rene Ruivivar (the Minas Gerais Forestry Project); Mary B. Anderson, Iain Christie, Chandra Godivitarne, Linda Lowenstein, Pat McCarthy, Grant Sinclair, and Mateen Thobani (the Nepal Municipal Development and Earthquake Reconstruction Project); Daud Ahmad and Paul Cadario (the North China Earthquake Reconstruction Project); Guy Motha and Michael Saddington (the Pakistan Income Generating Project); Michel Pommier and Mario Zelaya (the Taiz Flood Disaster Prevention and Municipal Development Project), Robert Nooter, Joe Searce, and Ronald Parker (the Sudan Emergency Flood Reconstruction Project). Ronald Parker also prepared a summary of conference proceedings