



A GLOBAL REPORT

REDUCING DISASTER RISK **A CHALLENGE FOR DEVELOPMENT**

United Nations Development Programme

Bureau for Crisis Prevention and Recovery

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REDUCING DISASTER RISK: A CHALLENGE FOR DEVELOPMENT
A GLOBAL REPORT**

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FOREWORD

Natural disasters exert an enormous toll on development. In doing so, they pose a significant threat to prospects for achieving the Millennium Development Goals in particular, the overarching target of halving extreme poverty by 2015. Annual economic losses associated with such disasters averaged US\$ 75.5 billion in the 1960s, US\$ 138.4 billion in the 1970s, US\$ 213.9 billion in the 1980s and US\$ 659.9 billion in the 1990s. The majority of these losses are concentrated in the developed world and fail to adequately capture the impact of the disaster on the poor who often bear the greatest cost in terms of lives and livelihoods, and rebuilding their shattered communities and infrastructure. Today, 85 percent of the people exposed to earthquakes, tropical cyclones, floods and droughts live in countries having either medium or low human development.

This Report is premised on the belief that in many countries the process of development itself has a huge impact — both positive and negative — on disaster risk. It shows how countries that face similar patterns of natural hazards — from floods to droughts — often experience widely differing impacts when disasters occur. The impact depends in large part on the kind of development choices they have made previously. As countries become more prosperous, for example, they are often better able to afford the investments needed to build houses more likely to withstand earthquakes. At the same time, the rush for growth can trigger haphazard urban development that increases risks of large-scale fatalities during such a disaster. The same is true in many other areas. While humanitarian action to mitigate the impact of disasters will always be vitally important, the global community is facing a critical challenge: How to better anticipate — and then manage and reduce — disaster risk by integrating the potential threat into its planning and policies.

To help frame such efforts, this Report introduces a pioneering Disaster Risk Index (DRI) that measures the relative vulnerability of countries to three key natural hazards — earthquake, tropical cyclone and flood — identifies development factors that contribute to risk, and shows in quantitative terms, just how the effects of disasters can be either reduced or exacerbated by policy choices. Our hope is that the index will both help generate renewed interest in this critical development issue and help bring together stakeholders around more careful and coherent planning to mitigate the impact of future disasters.



Mark Malloch Brown
Administrator
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UNDP is the UN's global development network, advocating for change and connecting countries to knowledge, experience and resources to help people build a better life.

Today, disaster reduction is a key component of UNDP efforts in crisis prevention and recovery. UNDP first allocated core resources for disaster preparedness in 1989, with an approved policy framework aimed 'to stimulate the interest and actions needed to create comprehensive disaster preparedness plans, strategies and structures and to promote disaster mitigation activities within the context of development planning and implementation'. The United Nations General Assembly has transferred to UNDP, the responsibilities of the Emergency Relief Coordinator for operational activities concerning natural disaster mitigation, prevention and preparedness. Furthermore, the UNDP Bureau for Crisis Prevention and Recovery (BCPR) has made considerable progress in developing an implementation framework that adds value to ongoing activities in disaster reduction.

UNDP plays an active and central role in the implementation of the International Strategy for Disaster Reduction (ISDR). This publication, *Reducing Disaster Risk: A Challenge for Development*, and the global review of disaster risk reduction, *Living with Risk*, published by the ISDR Secretariat, are two complementary and coordinated initiatives. They are aimed at assisting countries and international organisations to enable communities to become resilient to natural hazards and related technological and environmental disasters so economic, environmental, human and social losses can be reduced. UNDP and the ISDR Secretariat are currently working towards a framework of joint reporting on disaster risk reduction.

While much has been achieved, much remains to be done if disaster loss is not to jeopardise the achievement of the Millennium Development Goals. The humanitarian community has made progress in mitigating the losses and suffering associated with disasters through improved response preparedness and early warning. However, humanitarian actions do not address the development processes that are shaping disaster risk in the first place. The development community generally continues to view disasters as exceptional natural events that interrupt *normal* development and that can be managed through humanitarian actions.

The linkages between development and disaster risk are not difficult to visualize. Any development activity has the potential to either increase or reduce disaster risk. When a school or a health centre is destroyed in an earthquake, we have to remember that this same school or health centre was once a development project, whether funded from national budgets or external development assistance.

When we decided to produce a global report on development and disaster risk, we wanted to highlight these *development choices*. Disaster risk is not inevitable, but on the contrary can be managed and reduced through appropriate development actions. This is the message we want to convey in this Report to our programme countries, our donors, our partners in the United Nations system, regional and international organisations, civil society and the private sector. A great deal of support was provided in preparation of this publication, known as the *World Vulnerability Report* when the process began in 2000, and we acknowledge many generous contributions.

Contributors

The technical production of the Report was made by the following team: Mark Pelling (editor), Andrew Maskrey, Pablo Ruiz and Lisa Hall. Yasemin Aysan was responsible for the overall coordination of the Report in its first stages, with critical support from Ben Wisner and Haris Sanahuja.

The preparation of the Disaster Risk Index (DRI) was originally conceived during the meeting of a Group of Experts in 2000 and commissioned to the United Nations Environment Programme (UNEP) Global Resource Information Database (GRID) in Geneva. Main scientific collaborators include Hy Dao, Pascal Peduzzi, Christian Herold and Frédéric Mouton. Maxx Dilley and Haris Sanahuja provided key guidance in concepts and definitions. We would like also to thank those whose work has directly or indirectly contributed to the success of this research, such as Brad Lyon and his colleagues from the International Research Institute (IRI) for Climate Prediction at Columbia University for his methodology on determining physical drought. Regina Below and Debarati Guha-Sapir for EM-DAT databases and Bruce Harper, Greg Holland and Nanette Lombarda for input on tropical cyclones. This work also benefited from the contributions of Stephane Kluser, Antonio Martin-Diaz, Ola Nordbeck, Damien Rochette, Thao Ton-That and Bernard Widmer.

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Peter Gisle, John Handmer, Ailsa Holloway, Jorge Hurtado, Fouad Ibrahim, Amer Jabry, Allan Lavell, Komlev Lev, Paul Llanso, Elisio Macamo, Detlef Muller-Mahn, Elina Palm, Jennifer Rowell, Jahan Selim, Linda Stephen, Brian Tucker and Krishna Vatsa. The Report also benefited from additional initial inputs from Abdul Bashur, Mihir Bhatt, Peter Billing, Charlotte Benson, Christina Bollin, Lino Briguglio, Omar Darío Cardona, Bob Chen, Ian Christopolos, Edward Clay, Michael J. Coughlan, Uwe Diechmann, J. Dobie, Keith Ford, Terry Jeggle, Pascal Girot, Kenneth Hewitt, Julius Holt, Dilek Kalakaya, Charles Kelly, Thomas Krafft, Fred Krüger, Jaana Mioch, Helena Molin Valdes, Mary Otto-Chang, Dennis Parker, Edmund Penning-Rowsell, David Peppiatt, Everett Ressler, Andrew Simms, M.V.K. Sivakumar, Andrej Steiner, John Telford, John Twigg, Juha Uitto, Juergen Weichselgartner, Donald A. Whilwhite and Gustavo Wilches Chaux.

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Advisory Panel and Consultation Process

The Report underwent a long consultation process. An advisory panel made up of international experts and UNDP specialists in disaster reduction provided guidance and advice in the finalization of the Report. The panel included Andrew Maskrey (chair), Angeles Arenas, Mihir Bhatt, Thomas Brennan, Omar Dario Cardona, Maxx Dilley, Ailsa Holloway, Kamal Kishore, Allan Lavell, Kenneth Westgate, Ben Wisner and Jennifer Worrell. Additional inputs were received from Terry Jeggle.

The Report benefited from the discussions of the Working Group on Risk, Vulnerability and Impact Assessment of the International Strategy for Disaster Reduction (ISDR). A large number of consultations around the conception and preparation of the different components of the DRI were realized in 2002.

The Report was shared with a large number of UN organisations involved in disaster reduction: the Food and Agricultural Organization (FAO), International Labour Organization (ILO), the United Nations Centre for Regional Development (UNCRD), the United Nations Educational, Scientific and Cultural Organization (UNESCO), the United Nations Environment Programme (UNEP), the United Nations Human Settlements Programme (UN Habitat), the United Nations Office for the Coordination of Humanitarian Affairs (OCHA), the World Food Programme (WFP) and World Meteorological Organization (WMO). The Report was also shared with the Inter-American Development Bank (IDB), the International Federation of Red Cross and Red Crescent Societies (IFRC), the Organization of American States (OAS), the ProVention Consortium and the World Bank (WB). Their comments, suggestions and views have been extremely useful during the drafting of the final version of this Report.

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Bureau for Crisis Prevention and Recovery Support

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This Report would not have been possible without the many instrumental contributors. We hope that this common effort towards reducing disaster risk will make an important contribution to our main challenge, the achievement of the Millennium Development Goals.

Julia Taft
Assistant Administrator and Director
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ABBREVIATIONS

ADB	Asian Development Bank
ADPC	Asian Disaster Preparedness Center
ADRC	Asian Disaster Reduction Center
AfDB	African Development Bank
AGR _{EMP}	Percentage of labour force in agricultural sector
AOML	Atlantic Oceanographic and Meteorological Laboratory
AUDMP	Asian Urban Disaster Mitigation Program
BCC	Baroda Citizens Council
BCPR	Bureau for Crisis Prevention and Recovery
CDB	Caribbean Development Bank
CDC	Centers for Disease Control and Prevention
CDERA	Caribbean Disaster Emergency Response Agency
CDIAC	Carbon Dioxide Information Analysis Center
CDMP	Caribbean Disaster Mitigation Project
CDMS	Comprehensive Disaster Management Strategy
CEPREDENAC	Coordination Center for the Prevention of Natural Disasters in Central America
CGIAR	Consultative Group on International Agricultural Research
CIESIN	Center for International Earth Science Information Network
CMA	Cape Town Metropolitan Area
CMAP	CPC Merged Analysis of Precipitation
CNSS	Council of the National Seismic System
COPECO	National Commission for Contingencies
CPC	Climate Prediction Center

CPI	Corruption Perceptions Index
CRED	Centre for Research on the Epidemiology of Disasters
DAC	Development Assistance Committee
DFID	Department for International Development of the United Kingdom
DiMP	Disaster Mitigation for Sustainable Livelihoods Programme of the University of Cape Town
DMFC	Disaster Mitigation Facility for the Caribbean
DPC	Direction de la Protection Civile
DRI	Disaster Risk Index
ECHO	European Community Humanitarian Office
ECLAC	Economic Commission for Latin America and the Caribbean
EM-DAT	EM-DAT: The OFDA/CRED International Disaster Database
ENSO	El Niño/Southern Oscillation
FAO	Food and Agriculture Organization
GDP	Gross Domestic Product
GDP _{AGR}	Percentage of agriculture's dependency for GDP
GDP _{CAP}	Gross Domestic Product per capita
GEO	Global Environment Outlook
GIS	Geographical Information System
GLASOD	Human Induced Soil Degradation
GLIDE	Global Identifier Number
GRAVITY	Global Risk and Vulnerability Index Trend per Year
GRID	Global Resource Information Database
GTZ	German Technical Co-operation
HDI	Human Development Index
HDR	Human Development Report
HIPC	Heavily Indebted Poor Countries
HPI	Human Poverty Index
IDB	Inter-American Development Bank
IDNDR	International Decade for Natural Disaster Reduction
IFI	International financial institution
IFRC	International Federation of the Red Cross and Red Crescent Societies
IFPRI	International Food Policy Research Institute
IGAD	Intergovernmental Authority on Development
ILO	International Labour Organization
IMF	International Monetary Fund
IRI	International Research Institute for Climate Prediction
ISDR	International Strategy for Disaster Reduction
IUCN	World Conservation Union
LA RED	Network for Social Studies on Disaster Prevention in Latin America
LDC	Least Developed Country

MANDISA	Monitoring, Mapping and Analysis of Disaster Incidents in South Africa
MDGs	Millennium Development Goals
NCEP	National Center for Environmental Prediction
NCGIA	National Center for Geographic Information and Analysis
NGO	Non-Governmental Organization
NOAA	National Oceanic and Atmospheric Administration
OAS	Organization of American States
OCHA	Office for the Coordination of Humanitarian Affairs
ODS	Official Development Assistance
OECD	Organisation for Economic Co-operation and Development
OECS	Organization of Eastern Caribbean States
PADF	Pan American Development Foundation
PAHO	Pan American Health Organization
PhExp	Physical Exposure (if not specified, for drought)
PPP	Purchasing Power Parity
PRSP	Poverty Reduction Strategy Paper
SADC	The Southern African Development Community
SIDS	Small Island Developing States
SNPMAD	Sistema Nacional para la Prevención, Mitigación y Atención de Desastres
SOPAC	South Pacific Applied Geoscience Commission
U5 _{MORT}	Under five years old mortality rate
UNAIDS	Joint United Nations Programme on HIV/AIDS
UNCRD	United Nations Centre for Regional Development
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNEP/GRID	United Nations Environment Programme, Global Resource Information Database
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UNHABITAT	United Nations Human Settlements Programme
USAID/OFDA	United States Agency for International Development, Office of U.S. Foreign Disaster Assistance
USGS	United States Geological Survey
WAT _{RUR}	Percentage of population having access to improved water supply in rural area
WAT _{TOT}	Percentage of population having access to improved water supply
WAT _{URB}	Percentage of population having access to improved water supply in urban area
WB	World Bank
WFP	World Food Programme
WMO	World Meteorological Organization
WRI	World Resources Institute
WTO	World Trade Organization
ZENEB	Zentrum für Naturrisiken und Entwicklung (Center for Nature Risks and Development)