Edited by Alejandro López-Carresi, Maureen Fordham, Ben Wisner, Ilan Kelman and JC Gaillard

DISASTER MANAGEMENT

International lessons in risk reduction, response and recovery

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Disaster Management

There is a perennial gap between theory and practice, between academia and active professionals in the field of disaster management. This gap means that valuable lessons are not learned and people die or suffer as a result. This book opens a dialogue between theory and practice. It offers vital lessons to practitioners from scholarship on natural hazards, disaster risk management and reduction and developments studies, opening up new insights in accessible language with practical applications. It also offers to academics the insights of the enormous experience practitioners have accumulated, highlighting gaps in research and challenging assumptions and theories against the reality of experience.

Disaster Management covers issues in all phases of the disaster cycle: preparedness, prevention, response and recovery. It also addresses cross-cutting issues including political, economic and social factors that influence differential vulnerability, and key areas of practice such as vulnerability mapping, early warning, infrastructure protection, emergency management, reconstruction, health care and education, and gender issues. The international team of authors combine their years of experience in research and the field to offer vital lessons for practitioners, academics and students alike.

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Abbreviations and acronyms

ACDM	Committee on Disaster Management
ACLU	American Civil Liberties Union
ADB	Asian Development Bank
ADPC	Asian Disaster Preparedness Center
ADRC	Asian Disaster Reduction Center
AECID	Agency for Development Cooperation
AfDB	African Development Bank
AHTF	ASEAN Humanitarian Task Force
AIDMI	All India Disaster Mitigation Institute
ALNAP	Active Learning Network for Accountability and Performance in Humanitarian Action
AP	Asia-Pacific
ARPDM	ASEAN Regional Programme on Disaster Management
ASCE	American Society of Civil Engineers
ASEAN	Association of Southeast Asian Nations
AU	African Union
AUC	African Union Commission
AUDMP	Asian Urban Disaster Mitigation Program
CA	Change Agents
CAPRADE	Andean Committee for Disaster Prevention
CARICOM	Caribbean Community
CBDM	community-based disaster management
CBDO-DR	citizenry-based and development-oriented disaster response
CBDP	community-based disaster preparedness
CBDRM	community-based disaster risk management
CBDRR	community-based DRR
CBO	community-based organisation
CCAD	Central American Commission for Environment and Development
CCIB	Chamber of Commerce and Industry for Small Businesses
CDEMA	Caribbean Disaster Emergency Management Agency
CDERA	Caribbean Disaster Emergency Response Agency
CDKN	Climate & Development Knowledge Network

CDM	comprehensive disaster management
CDMP	comprehensive disaster management programme
CEDAW	Convention on the Elimination of All Forms of Discrimination Against Women
CEPREDENAC	Central American Coordination Center for Natural Disaster Prevention
CICERO	Center for International Climate and Environmental Research – Oslo
CIPDSS	Critical Infrastructure Protection Decision Support System
CMR	crude mortality rates
CPP	Cyclone Preparedness Programme
CRED	Centre for the Epidemiology of Disasters
CRRH	Central American Commission for Hydraulic Resources
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DCC	Disaster Coordinating Council
DEC	Disasters Emergency Committee
DHS	Department of Homeland Security
DM	disaster management
DMC	Disaster Management Centre
DRR	disaster risk reduction
ECB	Emergency Capacity Building
EDRR	Education for Disaster Risk Reduction
EGS	Employment Generation Schemes
EM-DAT	Emergency Events Database
EPS	Emergency Planning Society
ESCAP	United Nations Economic and Social Commission for Asia and the Pacific
ESD	Education for Sustainable Development
FEMICA	Central American Federation of Municipalities
FSWW	Foundation for the Support of Women's Work
GA	General Assembly
GBV	gender-based violence
GDN	Gender and Disaster Network
GDP	gross domestic product
GEHI	Global Emergency Health Initiatives
GEIS	Global Emerging Infections Surveillance and Response System
GFDRR	Global Fund for Disaster Risk Reduction
GHSI	Global Health Security Initiative
GIEH	Global Initiatives for Emergency Health
GII	Gender Inequality Index
GNDR	Global Network of Civil Society Organisations for Disaster Risk Reduction
GOARN	Global Outbreak Alert and Response Network

GOI	Government of India
GPS	Global Positioning System
GPSA	Global Pathogen Surveillance Act
HAC	Health Action in Crises
HEICS	Hospital Emergency Incident Command System
HFA	Hyogo Framework for Action
IAEM	International Association of Emergency Managers
IASC	Inter-Agency Standing Committee
IATA	International Air Transport Association
IAWG	Inter-Agency Working Group on Reproductive Health in Crises
ICS	Incident Command System
IDNDR	International Decade for Natural Disaster Reduction
IDP	internally displaced persons
IFAD	International Fund for Agricultural Development
IFRC	International Federation of Red Cross and Red Crescent Societies
IHR	International Health Regulations
IIASA	International Institute for Applied Systems Analysis
ILO	International Labour Organisation
IMF	International Monetary Fund
INGO	international non-governmental organisation
IPCC	Intergovernmental Panel on Climate Change
LAC	Latin America and the Caribbean
LDC	Least Developed Country
LESLP	London Emergency Services Liaison Panel
LPG	liquefied petroleum gas
LRRD	Linking Relief, Rehabilitation and Development debate
MFI	micro-finance institution
MISP	Minimum Initial Services package
MPA	Marine Protected Areas
MSV	Many Strong Voices
MTUS	Multinational Time Use Study
NAIS	National Agricultural Insurance Scheme
NAPA	National Adaptation Programme for Action
NCDM	National Council for Disaster Management
NDMD	National Disaster Management Directorate
NDMG	National Directorate of Meteorology and Geophysics
NEO	near-Earth objects
NGO	non-governmental organisation
NIPP	National Infrastructure Protection Plan
NREGS	National Rural Employment Guarantee Scheme
NSET	National Society for Earthquake Technology
NTD	Neglected Tropical Diseases

NTHMP	National Tsunami Hazard Mitigation Program
ODI	Overseas Development Institute
OECS	Organization of Eastern Caribbean States
OED	Operations Evaluation Department
OFDA	Office of Foreign Disaster Assistance
OSDMA	Orissa State Disaster Mitigation Authority
P3DM	Participatory 3-Dimensional Mapping
PAHO	Pan American Health Organization
PCCSP	Pacific Climate Change Science Program
PCDPP	Pan Caribbean Disaster Preparedness Project
PCVA	participatory capacity and vulnerability analysis
PLA	Participatory Learning and Action
PNG	Papua New Guinea
PONJA	Post-Nargis Joint Assessment
PPEW	Platform for the Promotion of Early Warning
PPP	public–private partnerships
PPPiE	Private–Public Partnerships in Emergencies
PREDECAN	European Union-Financed Disaster Prevention Project for the Andean Countries
PREVDA	Central American Environmental Vulnerability Reduction Project
PROMISE	Program for Hydro-Meteorological Disaster Mitigation in Secondary Cities in Asia
PRRM	Philippine Rural Reconstruction Program
PRSP	Poverty Reduction Strategy Paper
R2D	Relief to Development
RHRC	Reproductive Health Response in Crises Consortium
Risk RED	Risk Reduction Education for Disasters
RNA	Rapid Needs Assessment
SAARC	South Asian Association for Regional Cooperation
SDMC	SAARC Disaster Management Centre
SESP	School Earthquake Safety Program
SEWA	Self Employed Women's Association
SIDS	Small Island Developing States
SMEC	Sapang Maisac Evacuation Center
SNET	National Service for Territorial Studies
SRGDI	Sustainable Rural Growth and Development Initiative
STI	sexually transmitted infections
TCG	Tripartite Core Group
TEC	Tsunami Evaluation Coalition
U5MR	Under-Five Mortality Rates
UN	United Nations
UNDESA	United Nations Department of Economic and Social Affairs
UNDP	United Nations Development Programme

UNDP BCPR	United Nations Development Programme-Bureau for Crisis Prevention and Recovery
UNDP–RBA	United Nations Development Programme–Regional Bureau for Africa
UNECA	United Nations Economic Commission for Africa
UNEP	United Nations Environmental Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UN-INSTRAW	United Nations International Research and Training Institute for the Advancement of Women
UNISDR	United Nations International Strategy for Disaster Reduction
UN/SCN	United Nations Standing Committee on Nutrition
UNU-EHS	United Nations University – Institute for Environment and Human Security
UP	University of the Philippines
USACE	United States Army Corps of Engineers
USAID	United States Agency for International Development
USGS	United States Geological Survey
VCA	vulnerability and capacity analysis
VGF	vulnerable group feeding
VSA	Village Social Analysis
WASH	water, sanitation and hygiene
WB	World Bank
WHO	World Health Organization
WWF	World Wide Fund for Nature

1 Introduction

Who, what and why

Alejandro López-Carresi, Maureen Fordham, Ben Wisner, Ilan Kelman and JC Gaillard

Who needs this book?

We have produced this book for practitioners. Too much valuable research and reflection on disaster, hazards, vulnerability, risk and risk reduction has been written in technical language and published in either expensive or obscure places, or both. The editors have worked closely with practitioners at various scales for many years, probably well over 100 years if you total up our careers. We remain closely involved with networks that include many practitioners: the Gender and Disaster Network, Many Strong Voices, the Global Network of Civil Society Organisations for Disaster Reduction, the Emergency Capacity Building (ECB) Project, Periperi U, Duryog Nivaran, the Community Based Adaptation project and the RADIX network. At a further distance, we are also engaged with the Overseas Development Institute's (ODI) Humanitarian Practice Network, the Sphere Project and ALNAP, among others.

Recognising this gap, we tried to fill it with a book that digests research and reflection on good practice, edited specifically for practitioners. Our work was made easier by the fact that our chosen authors are to varying, but close, degrees engaged themselves with the world of practitioners – or are practitioners themselves – and come from many corners of Planet Earth.

What is a 'practitioner'?

If we parse the term 'practitioner', we find many kinds of people: the policymakers, project managers, extension workers, regulators, teachers, members of scientific research councils, **community** leaders – all of them found at different scales of government service; the staff of civil society organisations and their volunteers and pro bono advisors that number in the tens of thousands around the world; the professionals working with international non-governmental organisations (INGOs) and the larger national non-governmental organisations (NGOs); the employees of the UN and international agencies that have 'mud on their boots' (or if they are now in administration, once had that mud). Bilateral and multi-lateral donor team members are also practitioners, and again, those working in the field or closely involved on a day-to-day basis with partners are most likely to enjoy and benefit

from this book. So, too, perhaps, may some of the policymakers and advisors in donor headquarters, but likely not the political appointees who rule development assistance organisations (with minor exceptions).

This large cross section of people work in vastly different organisational cultures, pursue quite different careers, are younger and older, and are professionals and volunteers. Their lives differ greatly in terms of income, health care, housing, education for their children, safety of their own neighbourhoods and provision for their old age. They believe many different things about 'life, the universe and everything'. All these characteristics affect the way such **knowledge** workers take up, interpret and apply new knowledge. They also affect the manner in which they search for knowledge, together with the time and resource constraints that go with

Box 1.1 Some resources for practitioners

- ALNAP (Humanitarian learning network): http://www.alnap.org
- Climate & Development Knowledge Network (CDKN): http://www.cdkn.org
- Community Based Adaptation project: http://www.iied.org/cba7-seventh-international-conference-community-based-adaptation/
- Duryog Nivaran (South Asian practice network): http://www.duryognivaran.org/
- Emergency Capacity Building (ECB) Project: http://www.ecbproject.org/resources/resources-and-learning/
- Gender and Disaster Network: http://www.gdnonline.org/
- Global Network of Civil Society Organisations for Disaster Reduction: http://www.globalnetwork-dr.org/
- La Red (Latin American practice network): http://www.desenredando.org/
- Many Strong Voices: http://www.manystrongvoices.org/
- ODI's Humanitarian Practice Network: http://www.odihpn.org/
- Periperi U (African practice network): http://riskreductionafrica.org/en/home
- RADIX network: http://www.radixonline.org/
- Sphere Project: http://www.sphereproject.org/

their job descriptions. We have tried to take these existential realities into account in our choice of topics and authors.

The Drum Beat Network (2012) has carried out large surveys of development practitioners in order to find out what sources of knowledge they use. The results show that that they tap a wide variety of sources and that the gap between 'theory' and 'practice' or between 'academia' and 'the real world' is not as great as some might think. Some 1183 people completed the 2012 survey, from over 200 different agencies. Respondents included people with 121 nationalities, based in 115 different countries and covered a full range of primary job functions – with five roles having over 100 respondents: executive or decision-making; information or knowledge management; programme communication; programme management; and research or technical work. There was a good spread of primary areas of work – with the five top roles being health, education, governance, social and economic policy and gender.

In answer to the question: 'How do you keep up to date with the latest developments in your field?', more than 50 per cent replied: publications, colleagues within and outside my organisation and professional conferences. The survey further asked: 'Outside your organisation what kinds of professionals are you most in contact with?' Top of the list were: academics and technical experts (72 per cent), communication professionals (53 per cent), programme managers (53 per cent), and community or civil society leaders (51 per cent).

Other audiences for this book

We also think researchers and students will find this book useful: in particular, academics who are part of a rising wave of interest in interdisciplinary approaches to human development, security, environmental management, hazards, risk and disaster. Communication across and among disciplines has been made easier with the increased funding of teams that work hard to understand one another's language and approach to problems such as the ones just listed. This book can, among other things, help to encourage and validate such team approaches. However, our aim is more ambitious: it is also to encourage a young cohort of 'engaged' academics.

While our primary audience is those knowledge workers described above, we recognise as well that in the twenty-first century the 'engaged' scholar, researcher and academic is becoming an increasingly common figure. 'Engaged' has a meaning that overlaps somewhat with the more common term, 'applied'. In many disciplines inheriting their power structures and cultures from earlier centuries, 'applied' work is still considered second class, something that ranks 'below' highly theorised contributions and 'pure' science that are published in the 'top ranking' journals and earn for their authors recognition and job security. While this archaic bias persists, increasingly some have simply ignored that polarity and defined themselves as 'engaged'. This term describes researchers and scholars (outside as well as inside the academy) who have a long-term relationship of mutual respect and trust with people in communities and institutions with whom the engaged researcher co-produces knowledge. Taking such a stance, attempting to 'walk in

the shoes' (or rubber sandals) of her/his interlocutor, the engaged knowledge worker must adopt methods and frameworks that break down disciplinary and professional silos. As Marcus Oxley, coordinator of the GNDR (Global Network of Civil Society Organisations for Disaster Reduction) has put it: in villages and urban neighbourhoods, people conceive problems, threats and opportunities holistically.

Why is this book necessary?

Confronting the new normal without comforting rhetoric

In the shabby tradition of political rhetoric that has promised 'no child shall go hungry' (Henry Kissinger in 1975) and 'health for all by the year 2000' (World Health Organization), the **Hyogo Framework for Action**'s (HFA) expected outcome was 'The substantial reduction of disaster losses, in lives and in the social, economic and environmental assets of communities and countries' by 2015 (UNISDR, 2005:3). The midterm assessment of the HFA and subsequent reports show that the world cannot expect such a reduction (UNISDR 2011). On the contrary, the mounting evidence suggests that, notwithstanding many solid initiatives from community teams to national legislation, vulnerabilities continue to increase.

Sorting through the statistics is not an easy task, because for comparisons to be made across years, the changing baselines must be taken into account. That is, populations, communities and infrastructure are not the same from year to year. So the Emergency Events Database EM-DAT (http://www.emdat.be) reports that from 2005–2011, the number of deaths from disasters involving environmental events decreased from 2005–2007, jumped significantly in 2008, was extremely low in 2009, spiked in 2010, and dropped again in 2011. Specific disasters made a big difference, such as the 2008 earthquake in China just nine days after Cyclone Nargis struck Burma – with each event causing tens of thousands of deaths.

The events which cause the spikes are not the anomalies. Instead, they are symptomatic of the systemic vulnerability existing around the world, indicating major disasters just waiting to happen. This 'new normal' – or, in reality, not so new – is one of precarious existence for a large part of humanity produced by the negative, worsening influence of multiple crises: violence of all kinds, climate change, unplanned urbanisation, polarisation between rich and poor, **corruption** and bad government practice and the instability of a globalised economy. This means that disaster management and disaster risk reduction (DRR) cannot be seen as 'technical' matters. They are deeply political. Figure 1.1 suggests a wide range of interconnected processes at work that combine to produce and reproduce, generation after generation, conditions in which marginal people are allocated to marginal places; the weakest in society are placed in harm's way, usually not through their own choices.

The challenges apply to rich locations as well. The USA lacks neither wealth nor power, yet chooses and perpetuates allocations of that wealth and power that create and continue vulnerability. What can a disaster manager practitioner do

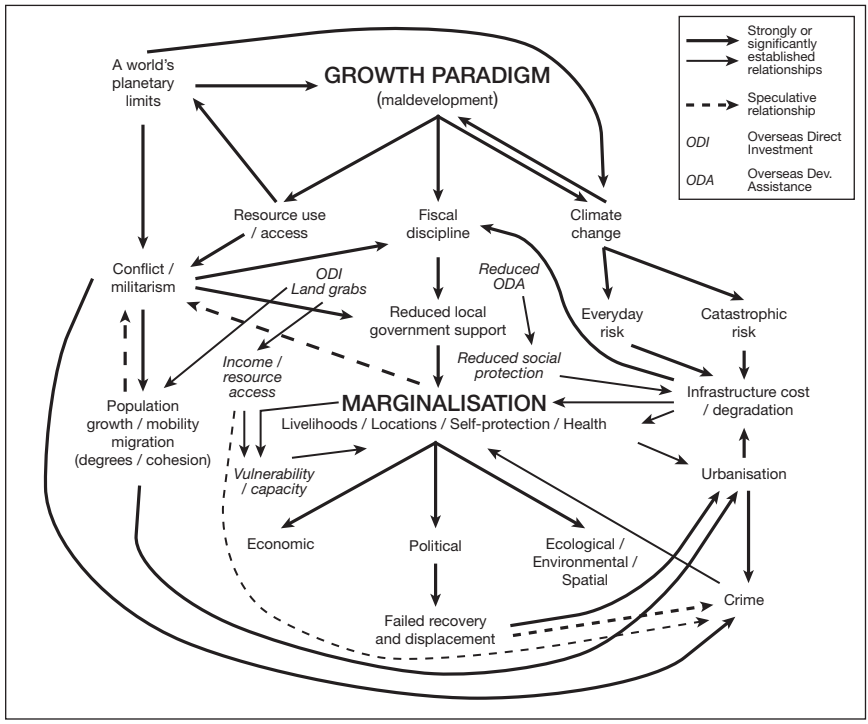

Figure 1.1 Spaghetti of doom: some complex interactions that link the dominant development approach to marginalisation and the creation of disaster risk

against the long-standing system in Figure 1.1 that encourages the destruction of wetlands along Louisiana's shoreline and forces poor people to live behind inadequately managed flood control works, thereby permitting Hurricane Katrina's storm surge to inundate New Orleans in 2005, killing over 1500 people? New York City is not going anywhere, meaning that emergency management practitioners must deal with the millions of people (rich and poor) and hundreds of billions of dollars of infrastructure in the flood zone, as demonstrated by Hurricane Sandy in 2012. These are the realities of vulnerability.

Frameworks that are supposed to guide the **policy**, programming and projects aimed at reducing disaster risk, such as the HFA, either completely ignore what one sees in Figure 1.1 or talk about these processes in vague ways that do not help practitioners. The framework we offer in Chapter 2 and the rest of this volume will hopefully begin to fill that gap.

The buzzword is not mightier than the sword

One only has to look at what the HFA lists as '**underlying risk factors**' to see that huge gaps exist. Corruption is not mentioned (Transparency International 2005, 2011; Lewis and Kelman 2012). There is no reference to land grabbing (LDPI

2012) in the name of 'modernising agriculture' or addressing 'the climate imperative' with production by foreign companies of biofuel for export on what was once land used by small farmers or herders (Wisner *et al*. 2012).

Again, the HFA makes much use of the phrase 'community participation', but large surveys at the grassroots conducted by the Global Network of Civil Society Organisations for Disaster Reduction in 2009 and 2011 showed that very little of what is done with money for DRR in national capitals 'trickles down' to localities (GNDR 2009, 2011). While **local governments** are the lynchpins for linking up community and civil society efforts with national resources, local government itself is starved of adequate resources (O'Brien *et al*. 2012).

Similarly, many other phrases, buzzwords, and concepts compete for attention and cause confusion. Just some of the examples are vulnerability, sustainability, resilience, resiliency, complexity, holistic, adaptation, adjustment, capacity, capability, surprise, transformation, and security. They all have their place and they all have the potential to confuse (Box 1.2).

But ultimately, dealing with disasters is about people and communities, not about words and phrases. Any practitioner (and academic) must keep in mind that words do make a difference, so it is important to clarify definitions and vocabulary

Box 1.2 Terminology

A new word is like a fresh seed sown on the ground of the discussion.
– Ludwig Wittgenstein

People use words such as 'disaster' and 'vulnerability' in many ways. There are 'common-sense' meanings, and these also vary from language to language. In addition, there are many 'technical' uses in different disciplines such as economics, politics, sociology, engineering, and climate science, among others. None of these uses are 'natural' or foundational. They all have histories and contexts, and to that extent are 'constructed'. Political, social, economic and gender power are evident in the choice of words and the meaning(s) they are given. Land-use changes that are 'resilient' over time in the face of climate change from the point of view of overseas agribusiness investors in an African country may not at all be 'resilient' from the point of view of small farmers or herders who are displaced from the land.

At a minimum, the core terminology used in this book has been standardised so that seeds of confusion are not sown together with the seeds of productive discussion. On the whole, we follow the usage recommended by the UNISDR (http://www.unisdr.org/we/inform/terminology). Where we differ, these key terms are discussed fully in Chapter 2. There is a Glossary of key terms used in this discipline on p. 310, and the Glossary word is emboldened on its first occurrence in the chapter.

to ensure that concepts are accepted and agreed upon. Then one must rapidly move on to the real work in terms of understanding the processes leading to disasters and how to solve those. Why do people live in certain places in certain ways? What options and **resources** do they have and not have? How do they interact and not interact with other sectors of the community and those further afield? How could that situation be changed without undermining or marginalising others? These questions are tackled on the ground and by the authors in this book.

What will you find in this book?

Part I Prevention and disaster risk reduction (DRR)

Part I deals with prevention of disaster and DRR. There are seven chapters. The section begins with a framework that has guided our organisation of the book and has also been found to be useful in operational contexts. The framework uses some basic concepts – **hazard**, **vulnerability**, **capacity**, **risk** and **participation**, and it is found in Chapter 2. Then, Chapters 3 and 4 firmly ground this book in the place where most practitioners are most at home: the community, and it explores a theme that is central to work by practitioners on DRR as well as **livelihoods**, health and empowerment, namely gender.

The community focus continues with Chapter 4 on the origin and development of **community-based DRR** (CBDRR), while Chapter 5 reviews the experience of people-centred early warning systems. Schools may act as centres of DRR in the community and are structures and functions in the community that must have priority protection. This is the argument of Chapter 6, which is taken up and amplified by a discussion of public awareness and adult education for climate change adaptation in Chapter 7.

The final chapter of Part I provides a thorough overview of the kinds of damage to structures and infrastructure that are vital to the entire built environment: from megacities and towns to neighbourhoods and villages to those in isolated locations – the built environment that is humanity's 'second nature' – as well as critical to economic activity and livelihoods. Without demanding expertise in engineering, this chapter also suggests ways of preventing or limiting such damage.

Part II Response and recovery

Five chapters delve into the issues surrounding response to and recovery from disaster. Chapters 9 and 10 are mirrors of each other. The former lays out the state of knowledge and practice as regards professional management of emergencies, while Chapter 10 enters the murky realm of mythology that attends such events. It covers persistent myths concerning disease, cadavers, social disorder and looting. The 'irrationality' of the common human response to disaster stands in contrast to the precarious rationality of the Emergency Operations Centre.

Health, micro-insurance and recovery are the subjects of Chapters 11, 12 and 13, respectively. They take us back to the community focus of this whole book since a robust primary health care system is shown to be a precondition for DRR in Chapter 11. Meanwhile, formal micro-insurance is a fairly recent outgrowth of the decades-old breakthrough known as microcredit. Chapter 12 discusses the need for micro-insurance and how it has functioned so far in a pilot in India. Recovery, in Chapter 13, is then shown on the basis of much experience to be successful only where communities are deeply involved in the design and implementation of rehousing and other sectors.

Part III Regional perspectives

Chapters 14, 15 and 16 trace the outlines of policy and practice in the face of regionally specific sets of hazards over the past few decades. These regional perspectives provide the context for understanding why implementation of the HFA has been difficult and why so few of the processes pictured in Figure 1.1 have been addressed. Yet they do narrate some progress, especially as regards engagement with communities, a shift from an exclusively technical focus on hazards to a consideration of comprehensive vulnerability and the establishment of mutual aid and co-learning arrangements among countries in these regions. Chapter 14 discusses Africa; Chapter 15 takes us to Latin America and the Caribbean; while the focus of Chapter 16 is Asia and the Pacific.

Part IV Tools

Part IV includes two chapters that both talk about tools that have been found useful as aids for CBDRR (Chapters 17 and 18). In the recent past, there has been an explosion in the availability and use of many different tools and methods with which communities may assess their own vulnerabilities and capacities, map hazards and plan systematically for increased safety.

The book ends with a special sort of Conclusion. We have asked a number of practitioners with long experience to review the chapters and to help us draw out lessons and recommendations for policy and practice. The conclusion is based on this correspondence. This is timely in the context of 2015 when the entire current architecture for reducing disaster risk, helping people adapt to climate change and implementing the Millennium Development Goals is up for grabs. Much improvement is needed in all these efforts, and they have to be tackled together, not from isolated 'silos' acting as distant, top-down command centres.

Under an improved regime for DRR, including climate change adaptation and nested within a New Development Agenda, practitioners will hopefully have more freedom to develop plans together with communities, to help implement them and to evaluate the effects. Our hope is that this little book can provide help for practitioners in doing precisely that.

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Part I

Prevention and risk reduction

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2 Hazard, vulnerability, capacity, risk and participation

Ben Wisner, Ilan Kelman and JC Gaillard

A framework for practitioners

Existentialist Søren Kierkegaard said of the huge system of ideas built by the philosopher Hegel that '[he was] like a man who builds an enormous castle and himself lives alongside it in a shed' (Kierkegaard 1840). In this chapter, we offer practitioners a way of framing the quest for reduced **vulnerability** to disasters, not by giving answers, but by suggesting useful questions. In Chapter 1, we critiqued the international frameworks generated both by individual disciplines and international agencies such as UNISDR (United Nations International Strategy for Disaster Reduction). They rarely help with the complexity that confronts local practice, the details and **root causes** of people's vulnerability, and their creativity and **capacity**. Let's see if we can do better with a grounded framework that has been built up from our observations in communities over many years.

Many causes but one clear truth: disasters are not 'natural'

Hazards

Human settlements and **livelihoods** depend on the Earth's variations and variability, past and present, in the form of geology, topography, bathymetry, geomorphology, climate, and the distribution of biota and fresh water. At the same time, these variations and variability pose potential threats, sometimes termed natural **hazards**. Extreme movements in the Earth's crust release energy experienced as earthquakes. Volcanic eruptions and tsunamis are other geological extremes. Climate extremes such as hurricanes release gigantic amounts of energy. Heat waves, blizzards, and ice storms are other climate extremes. Floods and mass movements such as landslides, rock falls, and avalanches are generally more localised but can be destructive and deadly, as are tornadoes and lightning strikes. Drought is a slow-onset hazard, but is nevertheless associated with large mortality, great economic cost, and significant displacement of people.

Hazards, however, are not in themselves a problem for humanity. As with the tree falling in the forest with no one around to hear it fall, every day thunderstorms flash and rumble around the world in uninhabited areas and over the large surface