PREPARING FOR DISASTER

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PREPARING FOR DISASTER

Building Household and Community Capacity

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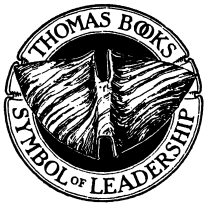

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PREFACE

Throughout human history, societies have been established and have developed, usually as a result of people's desire to profit from, benefit from, enjoy or utilize the physical, economic, and aesthetic amenities afforded by their natural environment, in areas that increase societal exposure to volcanic, wildfire, storm, flooding, tsunami, and seismic systems. Periodically, however, the activity of these often beneficial natural processes can interact with the human settlements in ways that create hazardous conditions for societies, their members and the institutions and infrastructure that people rely on to sustain normal functioning. When this happens, these natural processes become natural hazards.

When societies and their members find themselves, by accident or design, having to co-exist with natural processes capable of threatening life and livelihood, there is much they can do to protect themselves from the potentially adverse consequences of hazard events. However, despite the evident advantages that being prepared confers on people and communities, and the fact that people are often aware of their risk, research has consistently found that individual, community, and business preparedness levels tend to be low. This book examines why this is so and identifies what can be done to expedite the development of sustained preparedness, at household, community, and societal levels. It does so by emphasizing the need for this aspect of social risk management to be based on engagement principles: how people engage with their natural environment, how they engage with each other, and how people and agencies and businesses engage with each other. An engagement-based approach to hazard preparedness portrays preparedness as a process in which multiple stakeholders (people, scientists, risk management specialists, government agencies, businesses, etc.) share responsibility for societal risk management and play complementary roles in how it develops and how it is sustained over time.

Following a discussion of how people relate to the environmental hazards that they need to prepare for, the book then introduces what being comprehensively prepared to manage the impacts of natural hazards means. An

analysis of the nature and extent of people's preparedness is used to frame the progressive discussion of how intra-personal processes, social cognitive theories, and social theories can be used to both understand preparedness behaviors and inform the development of sustained individual, community, societal, and business preparedness.

Douglas Paton
John McClure

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PREPARING FOR DISASTER

Chapter 1

CO-EXISTING WITH A HAZARDOUS ENVIRONMENT

Civilisation exists by geological consent, subject to change without notice.
Will Durant (1885–1981)

INTRODUCTION

Throughout human history, societies have been established and have developed in locations which have resulted in their members living in proximity to natural processes associated with, for example, volcanic, wildfire, storm, flooding, tsunami and seismic systems. Decisions to live and develop in these locations can be attributed, at least in part, to people's desire to profit from, benefit from, enjoy or utilize the physical, economic, and aesthetic amenities these natural processes afford people and the societies they create. For example, seismic activity can create natural harbours and spectacular mountain scenery, river systems provide navigable routes for trade, and settlements established in volcanic regions often do so to benefit from the fertile soils found in these areas.

However, periodically, the activity of these natural processes can interact with the human settlements that have developed in these environs in ways that create hazardous conditions for societies, their members, and the institutions and infrastructure that people rely on to sustain normal functioning. Thus decisions made in the past, often with little knowledge of the potential threat posed by natural environmental processes, can result in people suddenly finding themselves living in harm's way. When this happens, these natural processes become natural hazards.

Thus, as Durant points out, nature can impose change on people and it can do so suddenly. However, the degree of notice of impending activity and

the extent of the imposed change that accompanies the action of natural processes are outcomes that are, to some extent at least, within the realm of human influence. This book is concerned with identifying how this influence can be exercised by people, communities, and societies. Understanding how people can exercise this influence starts with appreciating the difference between natural processes, natural hazards, and disasters.

NATURAL PROCESS, NATURAL HAZARDS, AND DISASTERS

It is important to note that natural processes are not hazards per se, and hazard activity cannot always be equated with disaster. Natural processes become hazards when the levels of their activity reach a level of intensity or persistence that threatens people and what people value and can significantly disrupt or destroy the infrastructure, systems, and institutions that sustain societal functions. When the interaction between human settlements and human-use processes (e.g., utilities, transportation, administration, etc.) and natural processes (e.g., hurricanes, earthquakes, and floods, etc.) reaches a level where lives being lost, infrastructure damaged or destroyed, societal functions rendered inoperative, and survivors' lives thrown into disarray, the action of a natural hazard becomes a disaster.

Extreme levels of natural process (e.g., earthquakes) activity can expose populations and social systems to demands and consequences that fall well outside the realm of normal human experience. This can occur suddenly (e.g., as with earthquakes) or more insidiously over periods of time that can be measured in years or decades (e.g., as with environmental hazards such as salinity or drought). When particularly intense and/or prolonged hazard events do occur, they impact on people, they affect communities, disrupt the societal processes that serve to organize and sustain community capacities and functions. Consequently, in the absence of activities implemented specifically to develop a capability or capacity for continued functioning, normal routines (e.g., that rely on often taken for granted access to power and water, transportation, social services, etc.) will no longer be supported or maintained within areas affected by hazard activity.

The potential for interaction between natural processes and human settlements is ever present, but experience of events that pose a threat (i.e., when natural processes occur at levels that present hazards that communities have to respond to) is periodic and generally infrequent. If the nature of the activity of these natural processes can be understood and their physical, personal, and social consequences identified, it becomes possible to develop risk management strategies that can facilitate the ability of people and societies

to co-exist with the potentially hazardous elements in their environment. This can be done by mitigating the risk posed by natural hazards and/or developing the beliefs, resources, procedures, and competencies required to facilitate the ability of people, communities, and societies to anticipate what they might have to contend with and develop the knowledge, attitudes, and behaviors required to ensure they can cope with, adapt to, recover from, and learn from experience of natural hazard events and their consequences.

Mitigation and readiness (or preparedness) strategies afford societies and their members several ways in which they can protect themselves from hazard consequences, minimize the harm and adverse consequences they could experience, and enhance their ability to deal with any consequences they do experience. These activities fall under the general heading of risk management. The starting point for the development and implementation of risk management strategies is understanding what has to be mitigated or prepared for.

WHAT DO PEOPLE AND SOCIETIES HAVE TO CONFRONT?

Risk management starts with identifying the natural processes that exist within an environment and developing an understanding of how the action of these processes can create adverse circumstances for people, societies, and the physical and built environments they inhabit. Armed with this knowledge, scientists and risk management specialists are able to identify actions that can be taken to mitigate and/or manage the threat posed to people and communities. This process would be challenging enough if societies only had to contend with a single natural process. This is, however, rarely the case.

Many societies have to contend with their being susceptible to experiencing multiple hazards. For example, as the tragic events in Japan in March 2011 demonstrated, areas prone to offshore earthquakes can be susceptible to experiencing local-sourced tsunami that can strike in minutes. The Pacific Northwest of the USA faces similar risks. Residents in California can experience both geological (e.g., seismic, volcanic) and environmental (e.g., wildfire) hazards. Residents in countries like Taiwan are susceptible to experiencing geological (e.g., earthquake, landslide) and meteorological (e.g., typhoon) hazards. It is, however, possible to identify the hazards that can occur in a given area. The development of an inventory of the range of potentially hazardous natural processes in a given area defines its "hazard-scape."

Hazard-Scapes

The hazard-scape is a compendium of the natural processes from which the hazards a society and its members will have to contend with emanate. The process of populating the hazard-scape provides the foundation for identifying the hazard characteristics (e.g., ground shaking) and behavior (e.g., intensity, duration, distribution) that provide the raw material for risk management. Analyses of hazard characteristics and behavior define both what people and societies will experience (e.g., ground shaking) and how bad (e.g., how intense) these experiences could be. A further challenge to risk management arises from the fact that the hazard-scape is not necessarily a static entity.

The analysis of hazard characteristics and behaviors need not only be restricted to what is known to exist in the present (based on historical analyses). New scientific information about hazards or changes in environmental attributes (e.g., as a result of climate change) can change the hazard-scape in which people live their lives.

Changes to the hazard-scape could occur as a result of, for example, discovering previously unknown fault lines or as a result of seismic activity being triggered by isostatic processes triggered by loss of large ice fields (McGuire, 2012). Another interesting example, from the point of view of it coming out of left field, is recent research on the potential of a giant slab of rock, the so-called Noggin Block, situated near Australia's Great Barrier Reef to collapse and trigger a tsunami (Cairns Post, 2012). If this occurred, it would create a risk that would not previously have enjoyed a high profile in the areas that could be affected. The emergence of new or more severe problems will also arise from the insidious effects of climate change.

Climate change processes are likely to affect both the distribution and intensity of weather and meteorological hazards (e.g., increased hurricane risk, expansion of drought affected areas, more intense wildfires) and so change what people may have to contend with in future. Places exposed to wildfire hazards, such as California, Australia, Portugal, and Chile can expect to experience more frequent, more prolonged and more intense wildfire hazard events (Paton & Tedim, 2012). Climate change may result in areas which have previously enjoyed relatively benign relationships with their environment experiencing risk from new sources (e.g., increased risk of flooding or drought). Furthermore, the beliefs, decisions, and actions of those living with hazardous circumstances introduce another dynamic influence on how a hazard-scape might evolve over time. For example, people's decisions about land use (e.g., farming, land clearance, irrigation, and industrial development) are increasing the levels of acute and chronic environmental degrada-