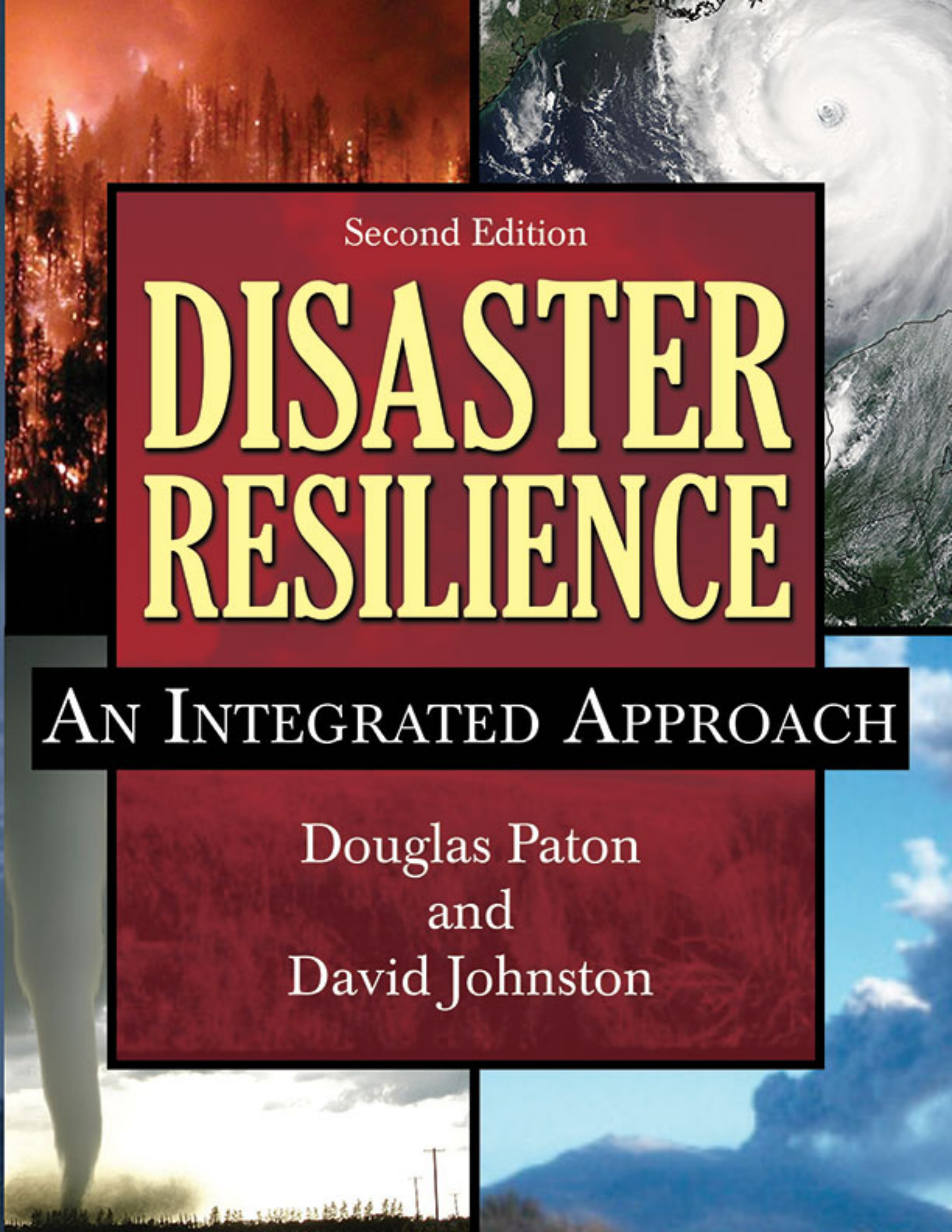

Second Edition

DISASTER RESILIENCE

An Integrated Approach

Douglas Paton
and
David Johnston

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Edited by

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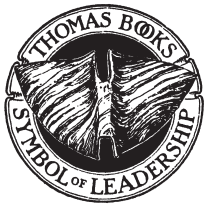

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PREFACE

Events such as the December 26th 2004 Indian Ocean tsunami, Hurricane Katrina in 2005, and the Japanese earthquake and tsunami in 2011 have provided unfortunate reminders of the susceptibility of many communities to devastating losses from natural hazards. These events provided graphic illustrations of how extreme hazard events adversely impact on people, affect communities, and disrupt the community and societal mechanisms that serve to organise and sustain community capacities and functions. While societies and citizens are powerless to prevent the occurrence of, for example, the seismic, volcanic, and tsunami activity that arises from plate tectonics, there is much they can do to mitigate their risk and to understand and manage the consequences they could experience should disaster occur. The construct that has come to epitomize how this is done is resilience.

This book describes resilience in terms of how interdependence between societies, citizens and environment creates a need to develop policies, plans knowledge, competencies, relationships that progressively support the development of strategies that facilitate the ability of societies and citizens to co-exist with an environment that presents opportunities and amenities, but also challenge and change. If the recommendations, resources, and practices contained in this volume can be developed in sustainable ways, estimates of community capability to anticipate, cope with, adapt to, recover from, and learn and develop from natural hazard events will increase substantially, as will confidence in the planning and policies that define societal responsibility and the actions they stimulate to develop resilience in societies and citizens who must co-exist with generally beneficial, but periodically hazardous environmental processes.

Douglas Paton
David Johnston

CONTENTS

DISASTER RESILIENCE

Chapter 1

CO-EXISTING WITH NATURAL HAZARDS AND THEIR CONSEQUENCES

Douglas Paton

Keep my words positive, because my words become behaviors.
Keep my behaviors positive, because my behaviors become habits.
Keep my habits positive, because my habits become my values.
Keep my values positive, because they become my destiny.

Mahatma Gandhi

INTRODUCTION

Fifty-thousand years ago, it has been estimated that there were some 5,000 humans on planet earth. The intervening millennia have seen this grow (and exponentially over the past 100 or so years) to over seven billion. During this time, humans have colonized every corner of the globe (except Antarctica) and demonstrated their capacity to cope with, adapt to and recover from many threats and challenging circumstances, including natural disasters, famine, flood, pestilence, disease and climate change, along the way (e.g., Burton, Diringer & Smith, 2006). As climate change looms as a significant threat to all humanity, and at a time of considerable political and social reluctance to accept the need to respond to this challenge, it is perhaps ironic that the human capacity to adapt and change may be due to that very phenomenon.

Slezak (2015) reviewed evidence suggesting that it was environmental change, rather than a specific environment, that drove human evolution. The research Slezak reviewed suggests that in environments in which substantial climatic shifts occurred every 10,000 to 20,000 years (over a period of a few million years), humans with a capacity to change and adapt to these dynamic conditions would have been selected for. While the work discussed by Slezak remains tentative, it is possible to speculate that the legacy of such

experiences has been a capacity to adapt to environmental change in modern humans that underpins the beliefs, behaviors and relationships encapsulated in contemporary understanding of "resilience." One thing is for certain, a need to be responsive and adaptive to environmental challenge and change is a capability that is becoming increasingly important for people, communities and societies.

Responding to Challenge and Change

A prominent reason why being responsive and adaptive to environmental challenge and change is important derives from the growing risk societies and citizens the world over face from the action of natural processes, such as volcanic, wildfire, storm, flooding, tsunami and seismic phenomena. Given the dynamic and complex nature of the characteristics and behaviors of these phenomena (Gregg & Houghton, 2006), it is not surprising that effectively managing the risk they pose is not a straightforward task.

Objectively, societal risk from natural hazards is constantly increasing. Even if the probability and intensity of the activity of the natural phenomena that create the hazards societies and citizens will encounter remain constant, factors such as continuing population growth and economic and infrastructure development in at-risk areas, are making incremental contributions to the potential magnitude and significance of the loss and disruption societies and citizens experience when disasters occur.

It is not possible for societies and citizens to directly influence the natural sources of the hazards (e.g., the seismic, volcanic and tsunami activity that arises from plate tectonics) they face. There is, however, much they can do to mitigate their risk and to understand and manage the consequences they could experience should disaster occur. The construct that has come to epitomize how this is done is resilience. This book explores how adding an environmental co-existence perspective can assist understanding the multifaced and dynamic nature of resilience. First, it is pertinent to ask why placing emphasis on environmental co-existence can complement and contribute to understanding risk management in general and resilience in particular.

Co-existing with a Hazardous Natural Environment

Decisions regarding the location of societal development have often reflected the association between geological and other natural processes and the resources and amenities (e.g., fertile soils, natural harbours, navigable rivers that serve as commercial highways, forests and wood products, water supplies, coastal and mountain scenery etc.) they create for societies and

citizens. The fact that the activities societies and citizens engage in to secure beneficial outcomes from their environment (e.g., where and how they build cities, develop economies through environmental resource use, harvesting forests, develop on flood plains, etc. –see Chapter 2) contribute to their ever-growing risk provides the fundamental rationale for including a co-existence perspective in how resilience is conceptualized. A co-existence framework may facilitate resilience by reconciling societal development goals with the concomitant need to manage risks emanating from the environmental context in which development is situated. There are precedents to adopting this kind of think to frame risk management.

A conceptualization which seeks to balance development with the proactive management of the challenges environmental processes present to societies and citizens is consistent with the original definition of risk. Dake (1992) discussed how the term risk originally defined a process of accounting for the *gains* and the *losses* that arise in circumstances in which chance influences outcomes. This way of thinking about risk, as a combination of gains and losses, echoes the meaning inherent in the Chinese symbol for crisis. By defining it as a mix of a 'danger' and an 'opportunity,' a crisis is represented as an event from which both losses and gains can ensue. Which outcome occurs, gain or loss or the balance between them, is something that is amenable to human intervention. The application of the concept of resilience is intended to tip the balance in favour of gains and development.

If the reality of being faced with potential gains (from environmental situation and characteristics) and potential losses (when the action of environmental processes turn hazardous) can be anticipated, societies and citizens can take steps to minimize potential losses and optimize the attainment of environmental gains. If transferred to a societal risk management setting, a co-existence framework thus affords opportunities for risk management to contribute to reconciling the benefits of sustainable societal development with the management of the periodic hazard activity that occurs when nature presents societies and citizens with its more malevolent side (Paton, 2000; Tobin, 1999). Pulling these various threads together, this book describes resilience in terms of how interdependence between societies, citizens and environment creates a need to develop policies, plans knowledge, competencies, and relationships that progressively support the development of strategies that facilitate the ability of societies and citizens to co-exist with an environment that presents opportunities and amenities, but also challenge and change.