

# Preface

The main topics of this volume comprise fundamentals, models, and information technologies (IT) means and tools for disaster prediction and mitigation. A more detailed list of topics includes mathematical and computational modeling of processes leading to or producing disasters, modeling of disaster effects, IT means for disaster mitigation, including data mining tools, knowledge-based and expert systems for use in disaster circumstances, GIS-based systems for disaster prevention and mitigation, and equipment for disaster-prone areas. The volume is not focusing on a specific type or class of disasters (natural or human-made). It was conceived to offer a comprehensive, integrative view on disasters, seeking to determine what various disasters have in common. Because disaster resilience and mitigation involve humans, societies, and cultures, not only technologies and economic models, special attention was paid in this volume to gain a comprehensive view on these issues, as a foundation of the IT tool design.

The concept for this volume is that of a collection of “state-of-the-art” expositions combined with prospective, “out-of-the-box” presentations of new directions. The book explores the recent conclusions of various bodies on the use of IT in emergencies and disasters, the predictable developments, and the required advances that would make IT and communications (IT&C) more useful in disaster mitigation. Some chapters also make implicit or explicit recommendations.

It is Editors’ view that a relevant purpose of the volumes in this series is to advance knowledge and science, as well as to help improving prevention and mitigation of disasters. This book was conceived taking into account that purpose. We hope that the audience of the book will find useful ideas and answers to several current questions related to IT means in disaster mitigation.

The structure of the volume reflects its purposes and scope. The first part of the book is devoted to fundamentals and modeling and includes chapters that do not bear directly to IT subjects, nevertheless relating intimately to the principles of modeling and use of IT in disasters. The second section addresses topics related to IT tools in disaster mitigations. The two sections are well balanced and they cover a wide range of issues.

In many respects, this volume is a ‘first’ as, with the notable exception of the volume edited by R. R. Rao, J. Eisenberg, and T. Schmitt on a similar but not identical topic (*Improving Disaster Management: The Role of IT in Mitigation, Preparedness, Response, and Recovery*. National Academy of Sciences. 2007), this is the first volume (and, relatedly, we had the first ARW) specifically dedicated to almost all aspects of IT use in the various phases of increasing the resilience of societies facing disasters.

This volume is *not* and should not be listed as a “conference proceedings”. Every lecture in the related ARW was carefully drafted as a chapter, with an extended number of pages and deep coverage. The chapters were written after drafted versions of the general part and of the concept of the ARW and volume were circulated to the contributors by the first editor. All authors were asked to take into account the need for in-depth conclusions and recommendations. Moreover, the contributors, who are front-running scientists representing 14 countries, were selected based not only on top scientific merit, but on complementarity and variety of points of view too.

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