

## Preface

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Volcanic hazards and risk have not been considered in previous global assessments by UNISDR as part of the biennial reports on disaster risk reduction. This book developed as a consequence of Global Volcano Model (GVM) being invited to make such an assessment by UNISDR for its 2015 report. GVM worked in close collaboration with the International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI) to contribute four background papers for the 2015 Global Assessment Report (GAR15) of UNISDR. These background papers contain a lot more information than could be included in GAR15 and can be construed as the evidence on which UNISDR have been able to include volcanic risk into their report. Although the background papers were placed on the UNISDR website they would have become part of the ephemeral grey literature that increasingly pervades scientific publication. Thus the decision was made to publish the reports together as an open access e-book with the support of UNISDR.

The book represents the efforts of the global volcanological community to provide a synthesis of what we understand about volcanoes, volcanic hazards and the attendant risks. The book owes its existence to the efforts of many scientists from many countries. There are over 130 authors from 47 countries. Members of the World Organisation of Volcano Observatories (WOVO) have been immensely helpful and collaborative in providing information for the country profiles and making sure that the facts are correct. Outside of those who have directly contributed are many thousands of scientists throughout the world who have provided the data and scientific analysis within the peer-reviewed literature to contribute to the collective knowledge, which we have tried to synthesise. There will be shortcomings and omissions in any endeavour of this kind. GVM and IAVCEI have the ambition to carry out future global analyses to reflect advances in knowledge and to address shortcomings and omissions in this inaugural attempt at a global synthesis.

The book is organised and presented in a rather unconventional way, reflecting that it represents four different background papers for the GAR15. Each background paper has a different and complementary purpose and may also attract different readers. We decided not to change the reports in any significant way apart from some minor re-formatting and cross-referencing. The reader will likely notice some repetition between the main chapters, which reflects the logic of the reporting to UNISDR. Chapter 1 is a summary of our findings and key issues designed for a non-technical readership. We hope that a wide range of people within the disaster risk reduction community will find this chapter accessible. Our findings are evidence-based and draw from the scientific literature as well as some new analysis. We also utilise case studies to illustrate the issues or provide a more detailed analysis of certain key topics. Thus Chapter 2 is essentially a much longer version of Chapter 1 containing much more technical detail and the evidence base on which Chapter 1 draws, including references to the peer-reviewed scientific literature and authoritative sources. This chapter is written more for a technical audience or for those who want to understand the science and evidence in more detail. We do not though assume any expertise in geoscience disciplines so the chapter is reaching out to a wide technical audience within the disaster risk reduction (DRR) and natural hazards communities. Chapter 3 is a more specialist study of volcanic ash fall hazard based on the work of the GVM ash hazard task force. Ash hazard has risen to prominence in recent years due to the impacts on aviation and is the volcanic hazard where probabilistic methods have advanced the most. There are 23 case studies, each of which constitutes a short chapter. Brief synopses of these short case studies are included in Chapter 1 for the non-technical readership, with three

supplementary short case studies. These case studies were chosen to illustrate the wide range of scientific and risk management issues related to volcanoes. Finally there is supplementary material, which consists of profiles of each of the 95 countries and territories with active volcanoes. Most of these profiles were written in collaboration with members of the World Organisation of Volcano Observatories (WOVO). The intention is to update these profiles as new information becomes available and it is anticipated that these updates will be a collaboration between GVM and WOVO members.