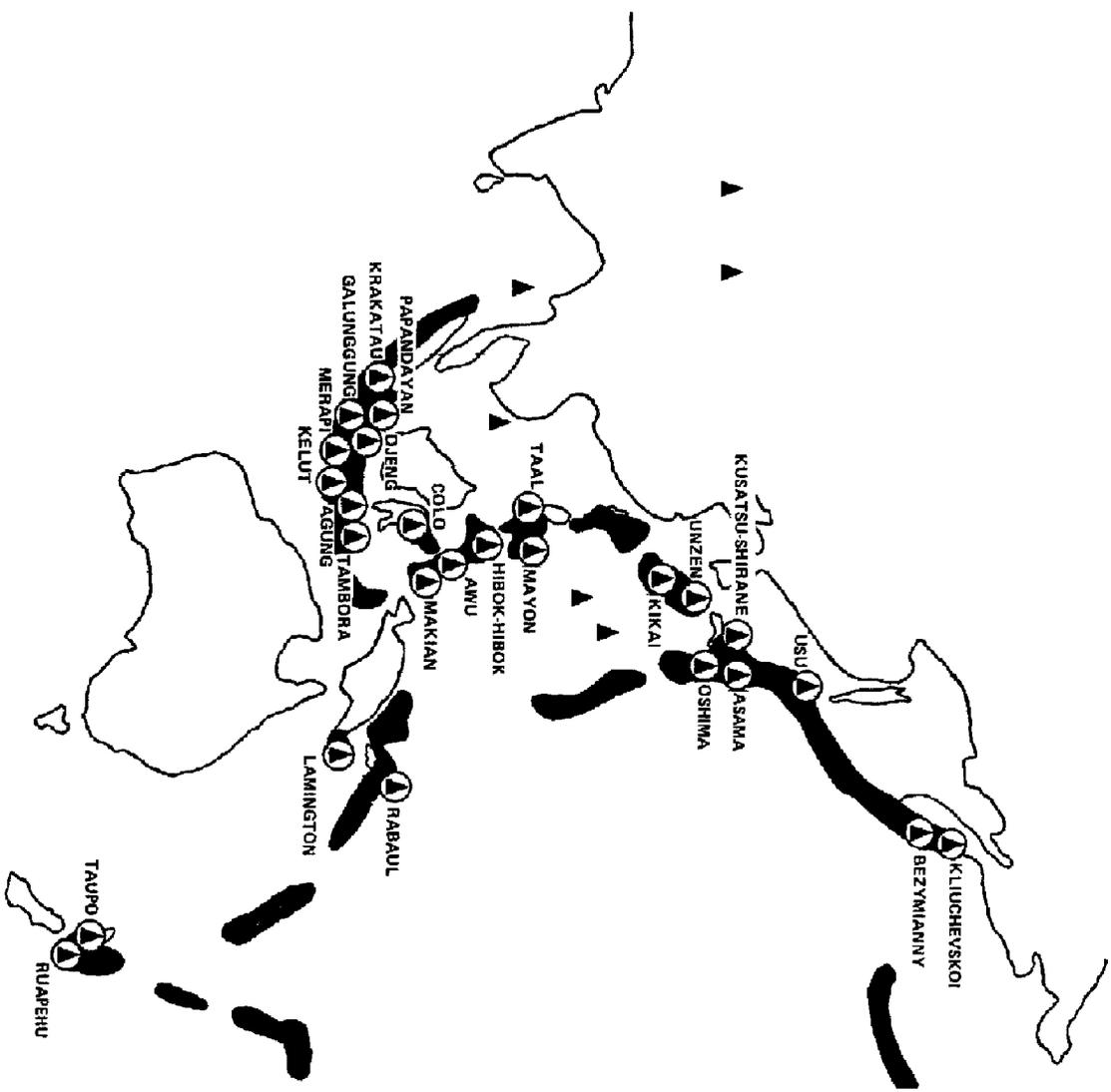


FIGURE 1

World distribution of volcanoes; names are appended for those to which reference is made in the text



**OFFICE OF THE UNITED NATIONS
DISASTER RELIEF CO-ORDINATOR (UNDRO)
Geneva**

Volcanic Emergency Management



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Cover photo: Glowing avalanches descending the south-eastern flank of Mayon Volcano, Philippines, on 23 September 1984. The view is from Casagua Ruins, buried by a large mudflow during the 1814 eruption.

FOREWORD

This handbook is the outcome of a suggestion, made at the General Assembly of the International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI) held in Durham, England in August 1977, that it would be useful to review the experience acquired in recent years in dealing with volcanic emergencies in various parts of the world, and to draw some general conclusions from this experience.

The United Nations Educational, Scientific and Cultural Organization (UNESCO) had already held, between 1974 and 1976, three regional seminars on the surveillance and prediction of volcanic activity, which, though devoted mainly to the scientific aspects, had stimulated discussions of the role that scientists could play in such emergencies, mainly by providing forecasts of eruptions which were imminent or in progress. In response to the suggestion made by IAVCEI, a meeting of experts was convened by UNESCO at its Headquarters in Paris in August 1978. The report on this meeting (UNESCO document SC-78/726/3) contains a list of topics suggested for inclusion in a handbook on the subject ; several of the participants offered to write, or to provide material for, the various chapters of the book.

As is often the case in collective efforts of this kind, the assembling of the material and the drafting of texts took considerable time. At a second meeting, held at UNESCO Headquarters in May 1980 (UNESCO document SC-E80/CS/649/2) progress was reviewed and several changes made to the outline and contents of the handbook.

The final text has been prepared in the UNDRO secretariat by a Senior Co-ordination Officer and vulcanologist with the assistance of Dr. E. M. Fournier d'Albe. It is based on the texts and other material provided by the following persons, whose collaboration is gratefully acknowledged:

- H. Kim, Hawaii County Civil Defense Agency, Hilo, Hawaii, USA.
- G. Petersen, Icelandic Civil Defence Organization, Reykjavik, Iceland.
- D. W. Peterson, US Geological Survey, David A. Johnston Cascades Volcano Observatory, Vancouver, Washington, USA.
- D. Shimozuru, Earthquake Research Institute, University of Tokyo, Japan.

Valuable advice and comments on the draft text were also received from the following persons: P. E. Baker, R. B. Crandall, R. S. Fiske, M. and K. Krafft, A. Sudradjat, H. Tazieff, R. I. Tilling, and G. P. L. Walker. Drs. M. and K. Krafft kindly provided the photographs reproduced in figures 3, 4, 6 and 8-17.

It is not the purpose of this handbook to discuss the details of the planning and organization needed to deal with volcanic emergencies, since these will of necessity vary from country to country according to political, social, legal and economic conditions and to the level of technological development. What has been attempted, is to distil from past experience in various parts of the world some general principles of organization and practice which, it is hoped, may prove to be of universal validity. The text has been kept as concise as possible, with numerous references to actual events.

The first two chapters review the nature of volcanic hazards and describe some recent emergencies caused by eruptions. The problems of assessing hazard (defined as the probability of occurrence of a potentially dangerous event) and of predicting the onset or development of volcanic eruptions, is dealt with in some detail in chapter 3.

Measures that can be taken to mitigate risk (defined as the probability of loss), and to protect life and property against destructive volcanic phenomena, and the limitations of such measures, are discussed in chapter 4.

Against the more violent manifestations of volcanic activity, the only possible protection is escape from the threatened areas. Mass evacuation and other protective measures are more effective if they are planned and organized before an emergency arises. The main elements of pre-emergency planning are identified and discussed in chapter 5. Mass evacuation entails, however, major disruption of normal life for large numbers of people and is only undertaken when the risks of staying in a threatened area are judged to be unacceptable. Chapter 6 discusses perception of and response to risk, and their implications for decision-making in volcanic emergencies.

Clear division of responsibilities and close liaison between the scientists, the civil authorities, the news media and the general public are of vital importance in all emergencies which call for rapid and decisive action by a whole community. The difficulties that may arise, and the means to overcome them, are discussed in chapter 7. Finally, in chapter 8, some examples are given of organizations which have been set up in various countries for volcanic emergency planning and management.

Awareness of the need to prepare for events such as volcanic eruptions and to provide protection against them, rather than simply to await and endure them, has been growing steadily throughout the world. It is hoped that this handbook will be of help to those involved in pre-disaster planning.

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