## Preface

Flooding is the greatest water-related natural disaster known to the human race – its human, material and ecological costs can be devastating for sustainable development. Floods affect an estimated 520 million people across the world yearly, resulting in up to 25,000 annual deaths. Along with other water-related disasters, they cost the world economy some \$50 to \$60 billion a year. An estimated 96 percent of deaths related to natural disasters in the past decade occurred in developing countries with limited capacity to forecast and manage these disasters. The number of people vulnerable to a devastating flood is expected to rise due to large-scale urbanization, population growth in natural flood plains, every increasing rate of deforestation, climate change and rising sea levels. New disaster risk reduction approaches are needed now to build the necessary capacity to address these challenges faced by some of the poorest in the world.

On the other hand, floods are natural phenomena, which contribute to the biodiversity and sustainability of ecosystems and to many human activities. Both developed and developing countries have benefited from economic development in areas prone to flooding. Close to one billion people – one-sixth of the global population, the majority of them among the world's poorest inhabitants – now live on the flood plains. Developing countries with mainly agricultural economies depend largely on their fertile flood plains for food security and poverty alleviation. The nutrient rich deltas of many river systems favor low-tech agricultural practices and provide livelihoods for millions. The wetlands in flood plains contribute to biodiversity and also create employment opportunities.

UNESCO and WMO, aware of both the significant achievements made in flood management in the recent years and of the existing opportunities to develop practical solutions within this context, launched the International Flood Initiative (IFI) in close cooperation with other partners such as the United Nations University (UNU), the International Association of Hydrological Sciences (IAHS) and the International Strategy for Disaster Reduction (ISDR). The initiative has developed an enhanced knowledge system on all flood-related activities, such as monitoring, network design, improving statistical analysis of floods, real-time forecasting and flood modeling and risk management.

In 2010 UNESCO's Division of Water Sciences has launched in the framework of the International Hydrological Programme (IHP) a new Book Series on floods as a contribution to the International Flood Initiative (IFI). The objective of the book series is to provide sound knowledge to the theory of flood disaster management and practice under the current climate change conditions. Best practices around the world and state of the art knowledge are presented along with a set of contemporary computational tools and techniques for managing flood disasters including remote sensing, spatial precipitation analysis, distributed hydrologic modeling and fuzzy risk analysis. The IFI Book Series comprises of four books:

- 1. Floods in a Changing Climate: Extreme Precipitation
- 2. Floods in a Changing Climate: Hydrologic Modeling
- 3. Floods in a Changing Climate: Inundation Modelling
- 4. Floods in a Changing Climate: Risk Management

All four books focus on various aspects of floods in a changing climate. The first book examines and enhances our understanding of the impacts of climate change on extreme precipitation events and quantifies the uncertainties and develops procedures and guidelines for risk-based decision-making in the presence of the impacts of climate change. The second book focuses on practical tools for hydrologic modeling of extreme water-related events under climate change conditions. This book concentrates on a selection of proper hydrologic modelling approaches for the estimation of floods. The third book presents hydraulic tools in public domain and focuses on the use of GIS technology for floodplain mapping under climate change conditions and finally the fourth book puts emphasis on different methodologies of flood risk management presenting fuzzy set approaches to water related disaster risk management. All books contain practical worked examples, case studies, annexes and supporting electronic materials which will be accessible on an accompanying website. The book series will help water managers, decision makers to deal with floods in a holistic manner. It will train students and will help educators to provide a fresh look at various aspects of integrated flood management.

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