

Preface

The Intergovernmental Panel on Climate Change's (IPCC) Fourth Assessment Report (2007), especially chapter 17: *Assessment of Adaptation Practices, Options, Constraints and Capacity* demonstrates the importance of adaptation to climate change. The IPCC (2007, 2014) warned that the megadelta basins in South Asia, such as the Ganges Brahmaputra Meghna (GBM) will be at greatest risk due to increased flooding, and that the region's poverty would reduce its adaptation capacity. A key issue in assessing vulnerability and adaptation (V&A) in response to extreme flood events (EFEs) in the GBM river basin is the concept of autonomous adaptation.

This book investigates autonomous adaptation using a multimethod technique which includes two participatory rapid appraisals (PRA), a questionnaire survey of 140 participant analyses over 14 *mauzas* in the case study area, group and in-depth discussions and a literature review.

The study has four key approaches. First, it reviews the flood literature for Bangladesh from 1980 to 2009 and identifies a general description of flood hazard characteristics, history, and research trends, causes of floods and types of floods. Second, it examines farmers' crop adaptation processes in a case study area at Islampur, Bangladesh, in response to different types of EFEs (multipeak with longer duration flood, single-peak with shorter duration flood and single-peak at the period of harvesting) and describes how farmers have been adapting to the extreme floods over time. Third, it assesses the V&A in response to three EFEs in 1998, 1995, and 1988. V&A are categorized on the basis of a weighted matrix index. The book uses PRA methodology and makes an important methodological contribution for assessing V&A. Fourth; the book assesses the economic consequences of failure effects of autonomous adaptation in response to EFEs. The results show that Bangladeshi farmers are highly resilient to EFEs, but the economic consequences of failure effects of autonomous crop adaptation (FEACA) on marginal farmers are large. These failure effects are defined as total crop loss against potential production, plus total agricultural cost multiplied by the number of flood events in the studied area. Total agricultural cost includes cost of seedlings, fertilizer, pesticides, land preparation, human labor, and watering. The book

estimates that the crop- related loss plus plants and houses damaged due to extreme flooding in 1998 in Bangladesh was US\$14001.26 million.

The book contributes to current knowledge by filling three important research gaps as follows: (1) farmers' autonomous crop adaptation processes in response to various types of EFes; (2) methodological contribution for assessing V&A through PRA; and (3) the economic consequences of the failure effects of autonomous crop adaptations. The findings of this study can act as a guide to policy decisions for effective allocation of adaptation funds at community level in Bangladesh. The book concludes that urgent action is needed to improve the sustainable crop adaptation capacity at community level in the foreseeable future to cope with extreme floods under a regime of climate change.

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Bangladesh

Processes, Assessment and Effects

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