

Impacts of climatic variability on agriculture and options for adaptation in the Surma River basin, Bangladesh

Md. Nazir Hossain  · Paromita Paul

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Abstract The objectives of this study are to explore the impacts of climatic variability on agriculture and to find out the viable options for adaptation to the changing climate. The primary data are collected through a questionnaire survey, key informant interviews and field observations in two agriculture-based villages of the Surma River basin. A household-level structured questionnaire survey was conducted on 260 households selected from 746 through simple random sampling. The study first explored the impacts of climatic variability on agriculture and fishery. Then, the existing adaptation measures undertaken by the farmer to combat the adverse impacts of climatic variability were identified. It was found that climatic variability adversely affects the crop production, crop diversity and cropping pattern in the study area. It hampers production rate, cultivation area, soil productivity and the mode of irrigation of an agricultural system of an area. Similarly, inauspicious climatic events also destroy the fishery and livestock sectors. In addition, the socioeconomic circumstances of farmers are also being influenced by climatic change. Hence, farmers are adopting feasible adaptation measures to cope with and adapt to the adverse and changing

climatic events. The present study explored a number of indigenous and modern adaptation measures undertaken by the farmers.

Keywords Climatic variability · Agriculture · Adaptation · The Surma basin · Bangladesh

Introduction

Climatic variability is defined as a variation in the mean state and related statistics of the climate on all temporal and spatial scales, beyond individual weather events (IPCC 2014; Paul et al. 2014). It is one of the major factors that influence all of the biophysical systems, and agriculture is the most vulnerable (Paul 1998; Gong et al. 2016). There is increasing evidence that greenhouse gases have already begun to warm the planet. If nothing is done to curb emissions, the stock of greenhouse gases is expected to increase substantially over the next century largely from burning fossil fuels. This, in turn, will cause future climates to warm and will likely cause changes in precipitation patterns (IPCC 2007). According to the fifth assessment report of Intergovernmental Panel on Climate Change (IPCC), each of the last three decades has been successively warmer at the earth's surface than any preceding decade since 1850 (IPCC 2014). In the northern hemisphere, 1983–2012 was likely the warmest 30-year period of the last 1400 years. Changes in many extreme weather and climate events have been observed since about 1950. Some of these changes have been linked to human influences, including a decrease in cold

M. N. Hossain (✉)
Office of the Deputy Commissioner, Kishoreganj, Bangladesh
e-mail: nazirawapoor@gmail.com

e-mail: nazir_saujan@yahoo.com

P. Paul
Department of Geography and Environment, Shahjalal University
of Science and Technology, Sylhet 3114, Bangladesh

Symposium On The Impacts Of Climatic Change And Variability On The Great Plains

Eric S. Kasischke, Brian J. Stocks



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Symposium on the Impacts of Climatic Change and Variability on the Great Plains Geoffrey Wall, Canadian Climate Centre, 1991 Report of the First U.S.-Canada Symposium on Impacts of Climate Change on the Great Lakes Basin Canadian Climate Centre, 1989 **Report of the First U.S.-Canada Symposium on Impacts of Climate Change on the Great Lakes Basin**, 1989 The symposium concluded that there is a high likelihood of a major climatic change in the Great Lakes Basin and recommended that the U S and Canada establish a joint planning group to develop an integrated study of the Great Lakes Basin as a regional pilot project *Ecological Consequences of Climate Change* Erik A. Beever, Jerrold L. Belant, 2016-04-19 Contemporary climate change is a crucial management challenge for wildlife scientists conservation biologists and ecologists of the 21st century Climate fingerprints are being detected and documented in the responses of hundreds of wildlife species and numerous ecosystems around the world To mitigate and accommodate the influences of climate ch *Modeling the Impact of Climate Change on Rice Production in Asia* Robin B. Matthews, C.A.B. International, International Rice Research Institute, 1995 Although recent rapid industrialization has contributed greatly to improved living standards it has also resulted in an increase in concentration of greenhouse gases leading to global warming The relationship between climatic change and agriculture is particularly important as world food production is under pressure from a growing population Rice is the second most important crop in the world after wheat with more than 90% currently grown in Asia where it is the main item of the diet It has been estimated that rice production needs to increase by 70% over the coming decades to meet the demands of population growth Hence it is vital to understand the effect of climate change on rice growth development and production This book is the outcome of a collaborative study between the United States Environmental Protection Agency s EPA Environmental Research Laboratory and the International Rice Research Institute It quantifies the impact of climate change on rice production using crop simulation models and integrates existing knowledge of the effects of increased levels of carbon dioxide and temperature Detailed scenarios are provided for selected major rice producing countries in Asia Japan India Malaysia South Korea China and the Philippines The book represents a major addition to the literature Impacts of Climatic Change and Variability on the Great Plains Canadian Climate Centre, Canada. Inland Waters Directorate, 1991 *Climate Change Impacts On The United States, The Potential Consequences Of Climate Variability And Change, Foundation, 2001*, 2001 **Droughts** Donald A. Wilhite, 2016-09-17 Drought draws together contributions from over 75 leading international researchers in the field to present the most comprehensive body of research on the physical and social dimensions of drought to date Including an extensive range of case studies covering the most drought prone and most affected countries the contributors examine new technology planning methodologies and mitigation actions from recent drought experiences worldwide Following a discussion of the critical concepts of drought the work is divided into the following additional parts causes and predictability monitoring and early

warning techniques impacts and assessment methodologies links between drought and other global issues conclusions and future challenges *Fire, Climate Change, and Carbon Cycling in the Boreal Forest* Eric S. Kasischke, Brian J.

Stocks, 2012-08-22 In boreal forests which contain large amounts of the world's terrestrial organic carbon fire is a natural and fundamental disturbance regime essential in controlling many ecosystem processes As a result of predicted climate change in the future the fire regime and consequently the forest cover and carbon storage of boreal regions will undergo dramatic alterations This volume discusses the direct and indirect mechanisms by which fire and climate interact to influence carbon cycling in North American boreal forests The first section summarizes the information needed to understand and manage fire's effects on the ecology of boreal forests and its influence on global climate change issues Following chapters discuss in detail the role of fire in the ecology of boreal forests Subsequent sections present data sets on fire and the distribution of carbon discuss the use of satellite imagery in monitoring these regions and discuss approaches to modeling the relevant processes The book offers the following new results improved estimates of carbon released during fires at a variety of scales from individual sites to the entire North American boreal forest region direct evidence of enhanced soil respiration after fire in Alaskan boreal forests studies of the influence of fire on long term forest succession patterns modeling results of the effects of climate warming on the fire regime examples of the use of satellite imagery to monitor surface characteristics important in carbon cycling modeling results of how climate change will interact with the fire regime to influence carbon storage *Selected Readings in Applied Climatology* Robert V. Rohli, 2015-11-25 Over the last 40 years

applied climatologists have been producing increasingly sophisticated and insightful research which has led to the current level of recognition that climate and particularly climatic changes have important environmental economic and recreational impacts Furthermore as societal needs for optimizing the use of resources increase applied climatology will continue to grow in importance *Selected Readings in Applied Climatology* is a collection of academic style vignettes of research over the past 40 years that represents the evolution of this important subfield and therefore provides a framework for appreciating the impacts of climate on society After an introductory editorial chapter placing the development of applied climatology in its historical context the book is divided into topical sections on applied climatological research in atmospheric circulation variability the biosphere water and energy resources agriculture and human health comfort and behavior The final section includes a collection of essays on communicating climatic information to the public *Selected Readings in Applied Climatology* will be beneficial to those whose field of interest affects and is affected by climate such as meteorologists ecologists water resource planners energy demand forecasters commodities brokers agriculturalists sociologists and media consultants

Symposium On The Impacts Of Climatic Change And Variability On The Great Plains Book Review: Unveiling the Magic of Language

In a digital era where connections and knowledge reign supreme, the enchanting power of language has become more apparent than ever. Its capability to stir emotions, provoke thought, and instigate transformation is really remarkable. This extraordinary book, aptly titled "**Symposium On The Impacts Of Climatic Change And Variability On The Great Plains**," written by a very acclaimed author, immerses readers in a captivating exploration of the significance of language and its profound impact on our existence. Throughout this critique, we will delve into the book's central themes, evaluate its unique writing style, and assess its overall influence on its readership.

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