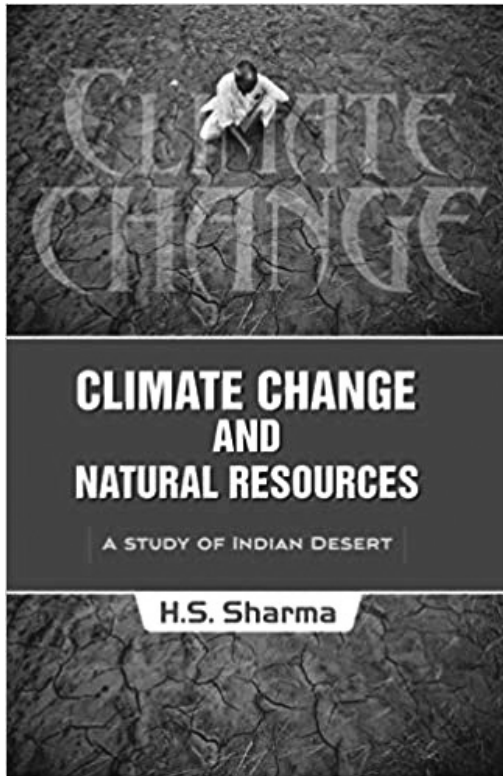


## Book Review - 1

### **Climate change and natural resources: A study of Indian desert by H. S. Sharma (2018)**

Concept Publishing Company, New Delhi. pp 268.



Climate change has recently become a focus of attention in geography. This book by Dr. Hari Shankar Sharma addresses in-depth and comprehensively the major issues associated with climate change and natural resources in the Indian desert. The book examines the relationship between climate change and natural resources during the last 112 years in the Indian desert and its impact on natural resources, particularly, land and water

resources. To that end, the book is a timely contribution. Climate change research by geographers has two objectives: firstly, description of temporal and spatial patterns of change and explanation of natural resource management, and secondly, identification of causal mechanisms. However, the association of climate change and natural resources in the Indian desert region has hardly been attempted by geographers. Such work with longitudinal analysis extending more than a hundred years with quantitative analysis was long overdue. The book is divided into seven chapters preceded by a foreword and preface. The organization of the book is straightforward. The genesis of this book lies in a series of national and international publications on desertification, groundwater resources, environmental geomorphology, climate change and human impact on the environment with special reference to the Indian desert. This research has been financially supported by a Senior Research Fellowship of the Indian Council of Social Science Research.

Chapter 1 is the most theoretically rich and engaging as this chapter provides an overview of book themes and states its objectives. The author seeks to demonstrate that (a) the study attempts to understand the changing pattern of climate during the last 112 years particularly, rainfall and

temperature, (b) to study impact of climate change on land and water resources and (c) to analyze the decadal land use changes and agricultural productivity in relation to climate, (d) to study desertification and its relationship with climate change and (e) to suggest adaptive strategies to mitigate the effects of climate change. Sharma has critically reviewed the literature on climate change-related to Rajasthan and the study is based on primary and secondary data collected at the district level. The simple linear regression technique was applied to develop a model between temperature/rainfall as the dependent variable and years as an independent variable. Sharma has taken a stratified sample of 20 villages in the five agricultural regions of Rajasthan covering 407 households. The primary survey conducted through a structured schedule contains 32 questions related to climate change, water resources, land use changes, agricultural productivity, and adaptation measures. The study area spread over 32 districts of Rajasthan forms the foundation of his observations. Chapter 2 provides an overview of temporal changes using graphs to identify the dominant pattern. Research on temporal changes in climate has recently become an area of active research and several geographers have contributed to this change. This chapter is the most significant part of the book, which is timely, detailed and well-illustrated. The author evaluates most of the climate variables like temperature, rainfall, number of rainy days, rainfall variability, extremes of rainfall conditions, droughts and trends of variation in temperature and rainfall. The chapter displays the scholarly and pedagogic accomplishment of the author in no uncertain terms.

Chapter 3, focusing on water, is a study in contrast between the surface and groundwater availability and their management. The surface water resources are limited, concentrated to south and southeast of the state, with Chambal and Mahi as the only two perennial rivers. The scanty and irregular rainfall from 1901-2012 has resulted in poor the recharge. On the other hand, recharge is expected to be reduced due to declining rainfall and increasing temperature. This is a valuable chapter in addressing the interplay between surface and groundwater resources and their inequality. Therefore, the state needs a more holistic and integrated management of its water resources. In chapter 4, Dr. Sharma offers a detailed account of the impact of climate change on land use, land use change and agricultural productivity. It appears that in all the three studies Dr. Sharma examined, there is an increasing trend of vegetation cover in desert districts due to increasing rainfall, degradation of forest in southern districts and an increase in agricultural productivity from 1985-86 to 2009-10. Particularly, a noteworthy aspect brought out by the present study is that the performance of agriculture in Rajasthan has been satisfactory despite adverse climatic conditions. However, there are many challenges to be tackled to accelerate future agricultural growth in Rajasthan in the event of climate change including but not limited to the expansion of irrigation, water management, low productivity, and agro-forestry. Chapter 5, on desertification and climate change, is both empirical and theoretical in approach. The stationary theory, sand spread theory and man-induced sand reactivation theories are the views

on desert expansion and desertification. Therefore, the process of desertification in Rajasthan is the result of natural and beyond human control. The author states that others are the result of human and animal interaction with the environment. The desert lands are classified into arid, transitional, semi-arid and sub-humid and humid region according to origin morphogenetic characteristics. This chapter is brief and useful for a quick review but readers looking for closure examination will need to consult more detailed studies. The author raises the question that the desert region faces a difficult challenge about the causes of desertification. Is there any widespread evidence that rainfall is decreasing or increasing in Rajasthan? If so, is a fluctuation in progress or is the decrease a lasting change? The author also indicates desertification to less soil moisture availability. This chapter also addresses the causes of desertification to monsoon rainfall and suggests deforestation and population pressure as the main cause of desertification. The most significant process of desertification in Rajasthan is wind erosion followed by degradation of vegetation and water erosion. Arguments in this chapter are complemented with tables, coloured figures and coloured photos that make it an interesting and attractive text. In this chapter, two districts, viz. Dausa and Ajmer have been selected to find out the changes in the status of desertification. Chapter 6 focuses on the relationship between people's perception and response from 20 sample villages in Rajasthan. Perception is a psychological process and is a subjective phenomenon. The 407 respondents are of the opinion that changes in rainfall are occurring more in Western Rajasthan and declining in

the eastern part of the Aravallis. Data also shows that temperature is increasing in all the regions of Rajasthan which is supported by regression analysis of temperature trends (1901-2012). As demonstrated earlier in this book, groundwater levels are declining in most parts of Rajasthan except the humid region.

The last chapter summarizes and provides future directions to this research. Chapters 2 and 5 form the core of this book. Dr. Sharma, a geomorphologist by training conducted field studies in Rajasthan. The book is well documented and illustrated with a detailed notes, photographs, figures, and tables. The cartographic work is generally impeccable though some maps are not dated at all. Responses elicited from 407 households have enriched the analysis. Rajasthan needs a more holistic and integrated management of its water resources. However, there are physical, financial and institutional constraints in achieving the same. In my opinion, Dr. Sharma's book is an outstanding scholarly work and a significant contribution to the body of literature on climate change. The book will be valuable to students, teachers, and researchers in several disciplines like geography, environmental studies, planning, resource management, and climatology. The publisher is to be commended for releasing the book at an affordable price.

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