

### About the book

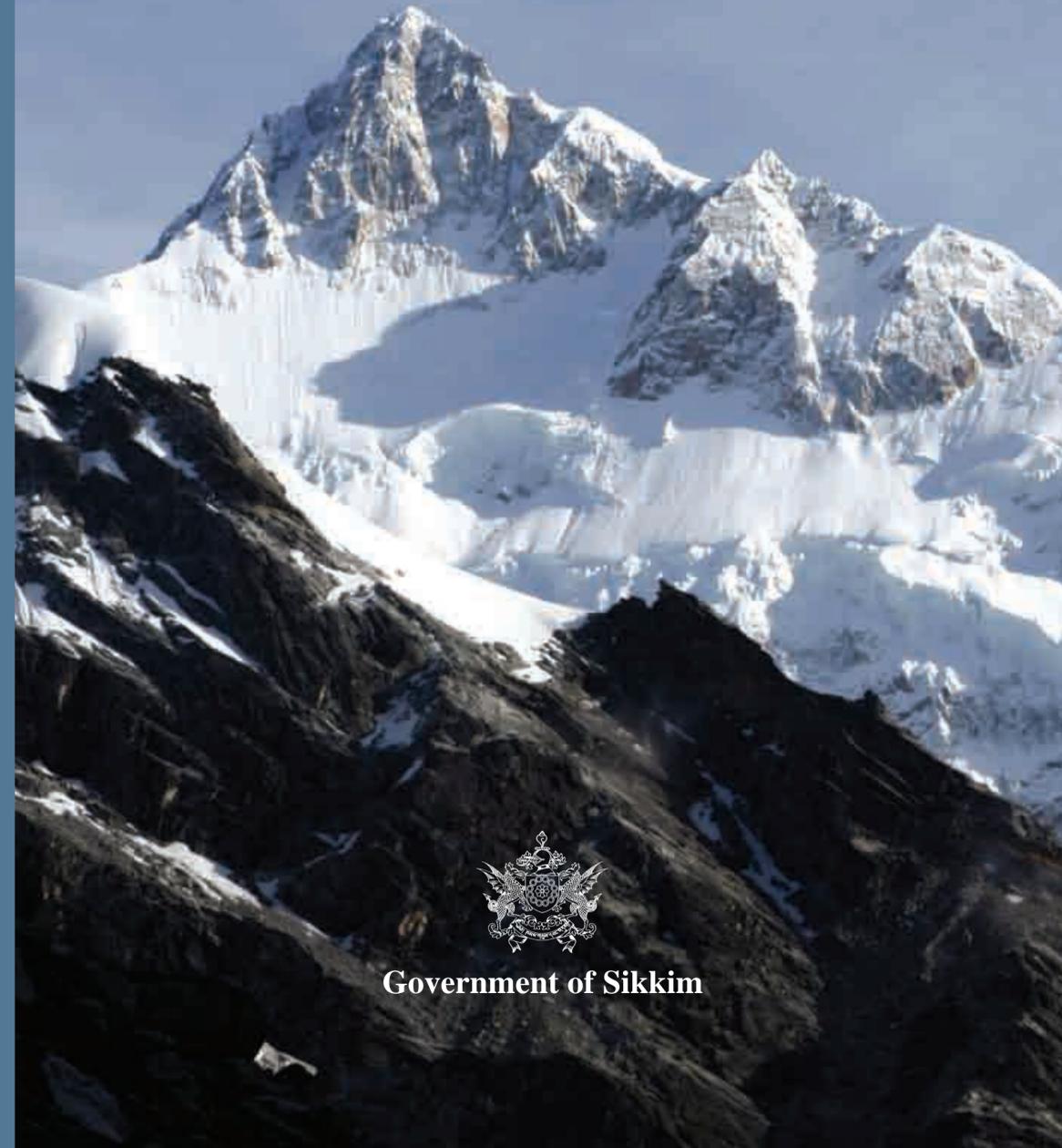
The novel idea of having a comprehensive, academic book, on climate change in Sikkim was conceptualized by the Chief Minister of Sikkim, Shri Pawan Chamling. The book is unique in the sense that it encapsulates scientific information in an attractive coffee table format. The book has been made possible by sharing of knowledge, based on years of in-depth research in the state, by several scholars affiliated to premier research institutes. Also several experts have selflessly contributed their photographs. This book is second in the series after Biodiversity of Sikkim, and is a compilation of a diverse set of 23 articles from eminent scholars and academicians. The articles include patterns of climate change, signals and indications, historical perspective, impacts of climate change on forests, glaciers, lakes, environment, flora, fauna, agrobiodiversity, indigenous livelihoods, vulnerability assessment and adaptation experiments which are being up-scaled and mainstreamed in the ongoing development programs. This book will help to consolidate the growing scientific literature in the state and assist budding scientists to assess the present state of knowledge. The whole book has also been made available online at the official website of the forest department - [www.siknvis.nic.in/climate-change-in-sikkim](http://www.siknvis.nic.in/climate-change-in-sikkim).



Climate Change in Sikkim  
Patterns, Impacts and Initiatives

# Climate Change in Sikkim

## Patterns, Impacts and Initiatives



Government of Sikkim

### Introduction

Climate change is emerging as a new challenge that governments have to address effectively. Climate change discussions which were earlier restricted to academic circles are now taking place amongst farmer's clubs, elected representatives, development institutions and donor agencies. Mountain regions are facing accelerating climate change, thereby adversely impacting ecosystems services, biodiversity elements and livelihood security. Mountain ecosystems due to their sensitive and fragile nature act as a laboratory where the impacts of climate change get amplified and can be studied closely and understood better. Impacts on mountain ecosystems are diverse and include receding glaciers, reduced snowfall, frequent natural hazards, higher surface runoff and soil erosion and declining dry season base-flow of rivers, streams and springs. Biodiversity gets affected due to phenology changes, reduced food availability in the wild, forest fires, degradation in habitat quality and even extinction. Also livelihood security gets compromised due to reduced productivity, water shortage, increased pest attacks, weed infestation and depredation by wildlife.

The strategy to combat climate change impacts will involve a greater use of science in decision making, new multi-sectoral institutional mechanisms and innovative use of financial resources. Rural areas where livelihoods are sensitive need to be addressed first. The Chief Minister of Sikkim – Shri Pawan Chamling has been sensitive to this emerging threat and proactive steps are already underway to mainstream climate change adaptation in the development planning of the State. Scientific studies, adaptation programs, multi-sectoral institutional mechanisms and village consultations have been organized to better understand and tackle this threat. The State Government has initiated a number of scientific studies to better understand climate change in the local context, established institutional mechanisms for implementing multi-sectoral programs, undertaken resource survey of water sources, taken up large-scale construction of water storage tanks at household and community level, initiated revival of springs, streams and lakes, expanded the network of minor irrigation channels and torrent control measures, ensured universal sanitation, strengthened the last mile delivery of social assistance and safety net programs, undertaken climate change related vulnerability assessments at Gram Panchayat level, launched the State Green Mission, the Sikkim Organic Mission and the Ten Minutes to Earth annual programme. Also the State Action Plan for Climate Change has been prepared after detailed multi-stakeholder consultations.