

Preface

High impact weather events are an inherent aspect of the climate system and are of different spatial and temporal scales. They have the potential to cause significant loss of life and property and a major disruption in communication and transport. Understanding the patterns of extreme weather events has assumed even more importance in recent years in the scenario of global climate change. Because of the significance of the extreme weather events in India, the India Meteorological Department, Ministry of Earth Sciences, Government of India, in collaboration with SMRC, Bangladesh, took the initiative to organize the SAARC Seminar on ‘High Impact Weather Events over SAARC Region’ during 2–4 December, 2013, in New Delhi, India, in order to shed light on the scientific basis and the complexities inherent in combating these events.

The objective of this seminar was to create a forum for discussion on the causes and consequences of high impact weather events in the SAARC member countries, to promote research activities with a view to make better understanding of the high impact weather phenomena and improve their forecasting to minimize loss of lives and properties of this region.

The broad thematic areas of the seminar were:

1. Climatology of high impact weather events
2. The dynamics of extreme events—improving forecasts in the current climate
3. High impact weather events/extreme events under changing climate
4. Consequence of high-impact weather events on the economy, infrastructure and society in various SAARC countries

Papers were received from scientists and National Hydrometeorological Service representatives from SAARC countries and a number of institutions like IIT, IITM, NCMRWF, IISc etc. from India. About 70 delegates from different SAARC countries participated in the seminar. During the seminar, there were nine technical sessions, a panel discussion and the concluding session. There were nine lead talks by eminent scientists in the field of heavy rains, thunderstorms, cyclones and

temperature extremes. A number of recommendations emerged after the seminar in each area of specialization.

The panelists agreed that, research being an important component of IMD, it should give special emphasis to high impact weather events, particularly impacts and prediction of heat waves and thunderstorms. More research work was required to make use of DWR data through calibration, validation and networking. Based on remote sensing data, flood and drought hazard proneness needs to be evaluated for SAARC region. There was a need for hazard and vulnerability analysis and climatology of HIWE for SAARC region. In case of heavy rains, there is the need to use rainfall forecasts in a hydrological model to generate surface run-off and thus chance of flooding. The need of high resolution mesoscale models with an interactive land surface model and data assimilation to generate heavy rainfall forecasts was discussed. The panel felt that more sensitivity studies on regional meso scale models was needed to understand the basic mechanism of rainfall over different regions as a result of interaction of monsoon circulation, transient systems, orography and mid-latitude interactions. A number of papers were presented on tropical cyclones and the committee stressed on application of DT to microwave imageries, microwave sounders to estimate the intensity of TC, augmentation of observational network in SAARC region, including surface and upper air observations. The committee stressed on a standard operational mechanism for exchange of data and information among SAARC member countries. Regarding the lack of ground-based observations, space-based observation through satellite was to be utilized maximum for monitoring of high impact weather events including rainfall, temperature extremes, winds etc. Need of a structured system of forecasting and warnings over SAARC region using High Resolution Ensemble for Short Range NWP models for nowcasts, regional cooperation through Severe Weather FDP, and standard operating procedure for all elements of monitoring, prediction and warning was stressed upon.

Considering the significant findings presented in the seminar by various delegates and the recommendations made in the seminar, it was decided to publish the selected papers presented during the seminar as a book after the peer review of the manuscripts.

This book deals with recent advances in our understanding and prediction of cyclone, severe thunderstorms, squalls, heat and cold waves and heavy rainfall, based on the latest observational and NWP modeling platform. The chapters are based on four broad high impact weather events i.e. thunderstorms, cyclones, heavy rains, and drought and temperature. They are authored by leading experts both in research and operational fields.

The book reviews research work, future needs, forecasting skills and societal impacts of above extreme weather events and is relevant to weather forecasters, managers, graduate students and provides high-quality reference material for the users.

As editors of this volume, we are highly thankful to all the authors for their efforts and cooperation in bringing out this publication. We are thankful to SMRC,

Dhaka, for approving publishing of this book. We are also thankful to the Advisory Council, National Organizing Committee, SMRC Organizing Committee and Local Organizing Committee for successfully organizing the SAARC Seminar during 2–4 December in New Delhi, India. Authors also thank the Ministry of Earth Sciences for facilitating the organization of the seminar.

New Delhi, India

Kamaljit Ray
M. Mohapatra
B.K. Bandyopadhyay
L.S. Rathore

High-Impact Weather Events over the SAARC Region

Ray, K.; Mohapatra, M.; Bandyopadhyay, B.K.; Rathore,
L.S. (Eds.)

2015, XIV, 414 p. 235 illus., 101 illus. in color.,

Hardcover

ISBN: 978-3-319-10216-0