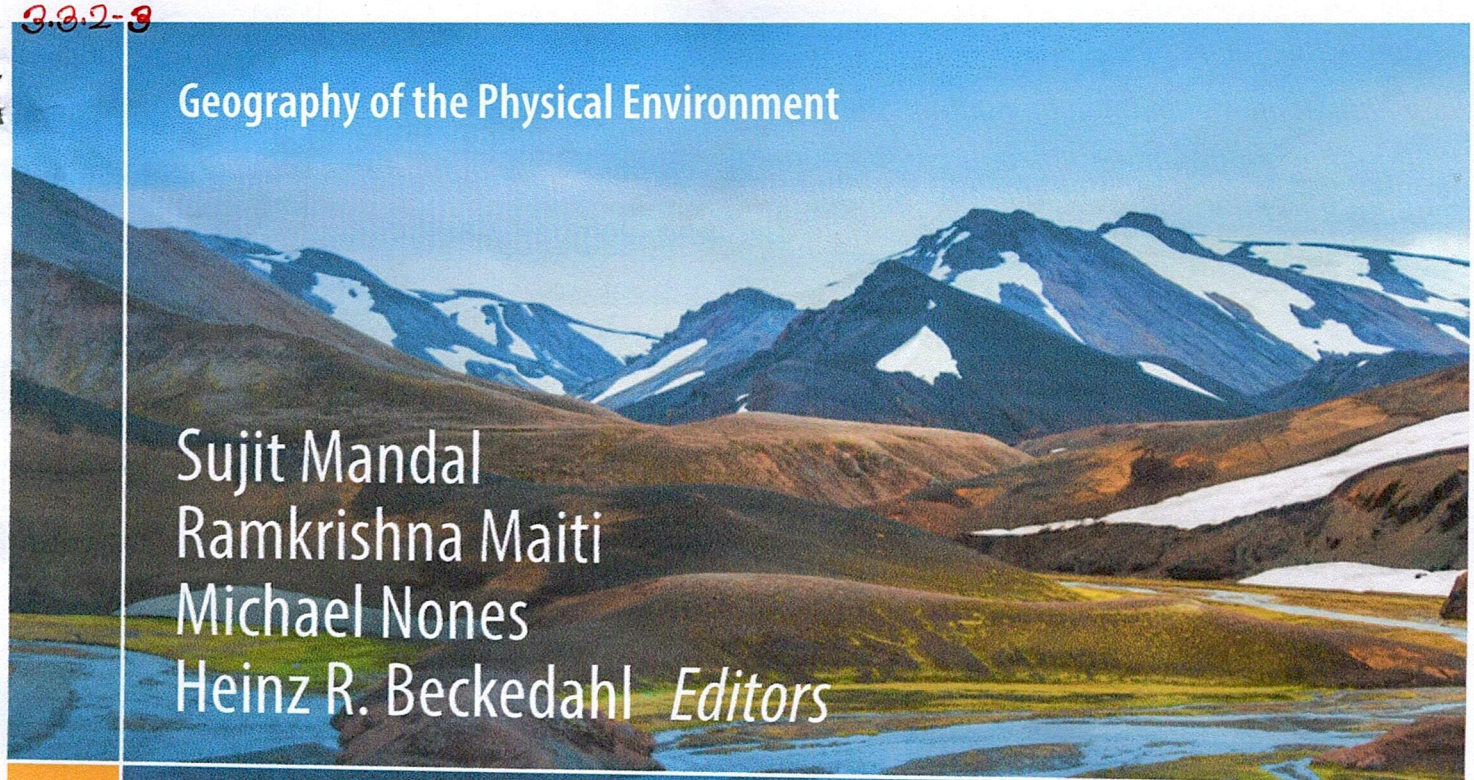
Geography of the Physical Environment



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# Applied Geomorphology and Contemporary Issues

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# Contents

# Inter-decadal Variability of Precipitation Patterns Increasing the Runoff Intensity in Lower Reach of Shilabati River Basin, West Bengal

9

Suparna Chaudhury

**Abstract**

Spatial and inter-decadal variability of precipitation patterns into different storm periods provides abundant impact on runoff, discharge that create the risk of rain-generated floods in this area. Ghatal subdivision is an administrative subdivision of Paschim Medinipur district in the state of West Bengal, India. This area is largely prone to devastating natural floods on a regular interval because of its shape, geophysical condition and geographical location and it is experiencing with riverine floods mainly by the Shilabati River and its tributaries. Heavy to very heavy rainfall associated with average 5–10 days cyclonic storms and depressions during the monsoon season is important factor for creating the annual flood in this area. The instrumental rainfall records of 20 years (2001–2020) reveal that percentage of average storm rainfall comparing to total annual rainfall has increasing from 63.10 in 2001 to 97.10 in 2020 and the average storm rainfall concentration has also exceed than annual rainfall of study area in few years. The highest storm rainfall over the area was 612.6 mm in the year 2017. As side by side percentage of runoff intensity has also increased from 47.36 in 2001 to 52.70 in 2020 that creates the risk of rain-generated floods in this area. Remote sensing data is used as the basic information input for computing runoff using the Soil Conservation Service (SCS) Runoff Curve Number (RCN) model used by US Department of Soil Conservation Service (1972). This empirical model is used for estimation of runoff intensity. So the floodplain users are coped to very heavy flood risks in future.

**Keywords**

Cyclonic storm and depressions · Monsoon · Runoff · Runoff curve number · Soil conservation service

## 9.1 Introduction

Rainfall and runoff are significant constitute for generating the river discharge in a watershed. (Zakwan et al. 2017). River basin morphology such as height, length, slope, shape, soil condition and land use have significant impact for the runoff generation in the river basin. Amongst the various methods, Soil Conservation Services and Curve Number (SCS-CN) technique is one of the unique methods for rainfall runoff modelling (Zakwan 2016). Land use and Land cover information is used to estimate the value of

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