

## **PREFACE**

The frequency of floods has increased in the past decade. The loss of life, property and other aspects are massive. A piece of near-real-time information on flood extent can help on-ground mitigation and relief processes. Kosi falls one among the List of most flood-prone areas. The study depicts the advances in remote sensing and GIS for automating flood monitoring by analysing rainfall patterns. The sentinel-1 and 2 scenes are used to identify past flood events for different study areas and are visualised in the global flood mapper. The flood pixels were downloaded, and flood maps were created for different flood events. The IMERG rainfall data is used to do rainfall analysis for 21 years. Fourteen, seven and three days cumulative moving sums were calculated for 21 years of rainfall data which provides information about the intensity of rainfall and its frequency over the study area. An optimised threshold value has been calculated to identify the chances of flooding.

The study further leads to identifying the dry and wet scenes for near-real-time flood monitoring. Catchment characteristics were studied to understand upstream and downstream patterns. Cloud processing platforms and open-source applications are utilised for the study so that users can easily access the data. An automotive approach was chosen to automate the processes during the analysis. A literature review was done on different flood events, and their causes were studied. The flood patterns were mapped using the polygons obtained from the Global Flood Mapper application. The flood events identified were mapped. The area affected by the flood was calculated. The relationship between rainfall patterns and floods was analysed and obtained using statistical studies.