

## PREFACE

River system is a complex closed system. Erosion, transportation & deposition are the primary mechanism of a system which make it dynamic in nature. This cycle is greatly governed by many external factors like land-use pattern, bed-elevation, bank-material composition, anthropogenic activities etc. Fluvial parameters are continuously adjusted infinitesimally by nature itself in its own paradigm. But when those parameters are disturbed at larger scale in shorter time frame, then it is necessary to study their causes. The objective of present study is a step to explore the same. Being a right bank tributary of river Ganga, the upper Mahananda basin is highly degradable in nature. Clearing hill-top, extensive deforestation, landslide, haphazard settlement, shrinking channels width by human activities, extensive bed material extraction activities etc. have greatly altered the natural stability of fluvial character of the region. Higher rainfall, higher ground permeability, gradient etc. are kind of own adjustment of nature in the region. But human activities have capability to change the system thousand times faster than the natural adjustment. The present research is focused on investigating the scenario of bank erosion and its related problem in upper Mahananda basin, Darjeeling district and the thesis is the outcome of the findings that have been collected from 2015 to 2018.

The thesis is contained in seven chapter. The first chapter deals with the introduction, problem, objective, hypothesis, literature review, and methodology of the entire research work. The second chapter deals with the overall physical background of the area and how it associated with the occurrences of the bank erosion. Overview of the bank erosion from 2016 to 2018 has been discussed in chapter three. Chapter four deals with the causative factors, types and mechanism of the bank erosion. The next chapter relates the different hydraulic parameters and the bank erosion rate and two models tested for the probability of the occurrences of bank erosion in the area. Chapter six deals with the problem faced by local people due to the river bank erosion and try to give some possible conservative measures to solve the problem keeping in view the overall environmental condition of the area. Finally. The thesis is a kind of diary that contain the facts that I have experienced during my intense field survey from 2015 to 2018. It reflects the overall bank erosion scenario of most of the foothills river in Darjeeling Himalaya. I hope that all who read it will find it interesting as well as informative.

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