



INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
SHORT ABSTRACT OF THESIS

Name of the Student : Ranjit Deka
Roll Number : 166104021
Programme of Study : Ph.D.
Thesis Title : Bank Erosion Problem in Large Braided River and its Solution
Name of Thesis Supervisor(s) : Arup Kumar Sarma
Thesis Submitted to the Department/ Center : Department of Civil Engineering
Date of completion of Thesis Viva-Voce Exam : 28th August 2024
Key words for description of Thesis Work : Braided river, River bank erosion, Anti-erosion measure, Dredging, Model study, Brahmaputra

SHORT ABSTRACT

Bank erosion is a major problem of braided river and various combinations of river training works are implemented for preventing such erosion. Bank erosion problem of river Brahmaputra is studied in this research work starting with bank line study and soil characteristics study. The research examines the characteristics of the river bank soil of the Brahmaputra River and investigates how they contribute to bank erosion. Physical model study of large braided river is a challenging task because of the scale distortion. Studying river bed scouring involves another challenge of having sediment of proper dimension to represent the actual field situation. Landsat series data and Sentinel-1 Synthetic Aperture Radar (SAR) data are used to identify best location and orientation of proposed dredging channel. Physical as well as mathematical model studies are carried out for three reaches in large tray available at NEHARI. Scope of using an innovative combination of dredged channel and porcupine screen is evaluated to save an erosion prone area of Brahmaputra through physical model study. Impact of bridge on bed scouring has also been investigated. In the physical model, study on transport of suspended sediment using small plastic granules of equivalent weight was attempted. The findings underscore the importance of integrating physical modeling with field observations for decision-making in river management and erosion control strategies. Overall, the study contributes valuable insights into the engineering measures to safeguard vulnerable riverine communities and infrastructure.

