

Hydrodynamic and Morphological Simulation of Karnafuli River Using CCHE2D Model

Authors : Shah Md. Imran Kabir, Md. Mostafa Ali

Abstract : Karnafuli is one of the most important rivers of Bangladesh which is playing a vital role in our national economy. The major sea port of Bangladesh is the Chittagong port located on the right bank of Karnafuli River Bangladesh. Karnafuli river port is considered as the lifeline of the economic activities of the country. Therefore, it is always necessary to keep the river active and live in terms of its navigability. Due to man-made intervention, the river flow becomes interrupted and thereby may cause the change in the river morphology. The specific objective of this study is the application of 2D model to assess different hydrodynamic and morphological characteristics of the river due to normal flow condition and sea level rise condition. The model has been set with the recent bathymetry data collected from CPA hydrography division. For model setup, the river reach is selected between Kalurghat and Khal no-18. Time series discharge and water level data are used as boundary condition at upstream and downstream. Calibration and validation have been carried out with the recent water level data at Khal no-10 and Sadarghat. The total reach length of the river has been divided into four parts to determine different hydrodynamic and morphological assessments like variation of velocity, sediment erosion and deposition and bed level changes also have been studied. This model has been used for the assessment of river response due sediment transport and sea level rise. Model result shows slight increase in velocity. It also changes the rate of erosion and deposition at some location of the selected reach. It is hoped that the result of the model simulation will be helpful to suggest the effect of possible future development work to be implemented on this river.

Keywords : CCHE 2D, hydrodynamic, morphology, sea level rise

Conference Title : ICABCE 2017 : International Conference on Architecture, Building and Civil Engineering

Conference Location : Singapore, Singapore

Conference Dates : May 04-05, 2017