

Evaluation of the Changing behavior of Brahmaputra-Jamuna River and consequent impacts on Landforms and Environment of Bangladesh

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Brahmaputra-Jamuna, the largest braided river systems in the world originating from the Himalayas met to the Bay of Bengal over Bangladesh through a long journey of 29,000 km. It plays the significant role on the development of landforms, water resources system, socioeconomic and environmental sectors of Bangladesh. The present research focused on the changing behavior of channel elements of Jamuna River section over the last 15 years. Satellite imagery of 1992, 1995, 1996, 1997, 1998, 1999, 2000 and 2001 were analyzed to identify the migration trend of the river reach as well as the environmental and geomorphological changes around the Jamuna bridge site. From this study, it is seen that the width of entire channel increased gradually with time. But after 1995, the planform of the river turned into a new phase. It has been widened drastically and developed large number of mid-channel bars. Besides, significant scouring has been observed along the left bank due to development of helical current near the bridge guide-bund. Due to river training works the bridge section became a funnel shaped regulated reach. As a result, severe channel shifting has been going on along the left bank (Bhuapur). From the overall analysis of the remote sensing time series and empirical analysis from Ikeda and Hasagawa for the same area, it could be recommended that in near future the channel flowing along east guide bund may bypass the bridge a few kilometers eastward.

Land use changes surrounding the study area also have been evaluated by digital image classification techniques and ground truthing for the same class. Entire landscape has been classified into seven classes as wetlands, agricultural lowland, agricultural highland, settlement, barren land, temporary sand bar and water body. The observation showed that wetlands were gradually reduced with time by the successive increment of barren land, settlement, sand bar and agricultural low land. The total amount of wetland in 1992 was around 27,000 hectares but in 2001 it reduced into 8,000 hectares. Therefore, the changes of wetland around the floodplain of Jamuna have been reduced 3 folds over the last 10 years. This change occurred due to rapid development of natural levee and deposition of sand sheet on the flood plain during peak flow. The lateral migration of banklines, aerial development of mid-channel bar and drastic changes of landforms are identified as critical threat for geoenvironment. They may turn the Brahmaputra-Jamuna area an ecological and environmental disaster prone and also may change the biodiversity as well