

## RIVER CHANNEL CHANGES OF THE BRAHMAPUTRA IN INDIA USING GEOSPATIAL TECHNIQUES

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### ABSTRACT

The river Brahmaputra has been the lifeline of northeastern India since ages. This mighty trans-boundary river runs for 2880 kms through China, India and Bangladesh. The Brahmaputra is one of the world's largest rivers, with a drainage area of 580,000 sq. km. (50.5% in China, 33.6% in India, 8.1% in Bangladesh and 7.8% in Bhutan). In India, its basin is shared by Arunachal Pradesh (41.9%), Assam (36.3%), Meghalaya (6.1%), Nagaland (5.6%), Sikkim (3.8%) and West Bengal (6.3%). Any alluvial river of such magnitude has problems of sediment erosion-deposition attached with it; the Brahmaputra is no exception. The problems of flood, erosion and drainage congestion in the Brahmaputra basin are gigantic. The floods inflict widespread damage to crops, property and life, disrupt communication, create health hazards causing misery and suffering to the people of Brahmaputra basin. Hardly a year passes when the region does not experience floods. Associated with the floods the problem of erosion has assumed serious proportions in the Brahmaputra basin. Assessment of erosion in general is based on the ground based information over different land parameters. The methods of collection of ground data are generally cumbersome, time consuming and are cost prohibitive. The satellites provide invaluable and timely information over land parameters on repetitive basis which is cost effective compared to the ground based methods. The satellite data is easy to use and requires lesser time for analysis. In order to understand morphological changes of the Brahmaputra river a study of river channel changes of the Brahmaputra river has carried out by the authors. The present paper briefly describes a study of the Brahmaputra river - its entire

course in Assam from Kobo u/s of Dibrugarh up to the town Dhubri near Bangladesh border for a stretch of around 620 kms using an integrated approach of Remote Sensing and Geographical Information System (GIS). The channel configuration of the Brahmaputra river has been mapped for the years 1990, 1997, and 2008 using IRS 1A LISS-I, IRS-1C LISS-III and IRS-P6 LISS-III satellite images respectively. The analysis of satellite data has provided not only the information on the channel configuration of the river system on repetitive basis but also has brought out several significant facts about the changes in river morphology, stable and unstable reaches of the river banks, changes in the main channel of the Brahmaputra river, etc. The integration of the thematic information has indicated increase in the erosion of both the banks.

It is envisaged that the conjunctive use of the results presented in the paper with other ground based data will contribute substantially in the more meaningful approach towards planning and execution of means and measures to combat floods and erosion. The results may also provide latest and reliable information on the dynamic fluvio-geomorphology of the Brahmaputra river for designing and implementation of drainage development programmes and erosion control schemes in the north eastern region of the country.