

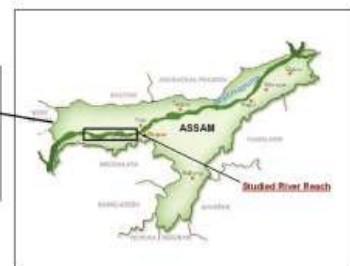
Erosion Problem of the Brahmaputra River (Palasbari) and its Impact on the Local Area Erosion – A Remote Sensing and GIS Based Approach

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Introduction

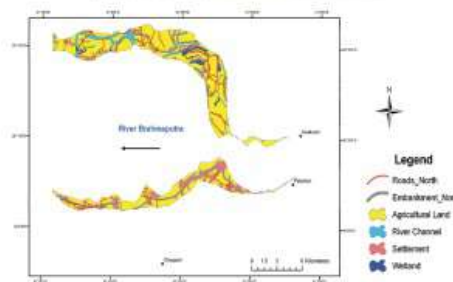
- River bank erosion by the Brahmaputra & its tributaries has become one of the major natural hazards for the river bank people.
- Morphology & behavior of the Brahmaputra river throughout its 720 km course in Assam undergoes drastic changes in response to its seasonal rhythm of Monsoon & freeze-thaw cycle of the Himalayan snow.
- Stability of bankline depends upon bank materials, water discharge, nature of sediment load and slope. There are several hydrological, geological and anthropogenic factors that are responsible for the stability of river bank and channel migration.



Location Map of the study area

Database & Methodology

- The SOI toposheets provided the position of the river bank line for the year of 1972. While the river bankline position for the year 2006 were obtained from the IRS images.
- 4-bands IRS images of LISS-III sensor provided the image with ground resolution of 23.5m.
- The North and the South bank of the river were digitized in the GIS environment from the toposheets and satellite imageries of different years.
- To calculate the **total area and rates of deposition / erosion** in 2006 with respect to 1972, polygons representing the area of erosion and deposition have been created for different periods in both the river banks.
- Loss of various land resources and infrastructures in the riverine area, because of erosion, is being estimated.



Affect of bank line recession on Land Resources and Infrastructure within the studied reach of the river Brahmaputra

Because of the continuous bank line recession, various land resources and infrastructures in the riverine area is being lost.

Infrastructures	Area (in sq.km) / Length (in km)	
	North Bank	South Bank
Settlement Area	6.09	8.07
Roads (in length)	50.88	26.61
Embankments (in length)	15.85	24.19

Natural Resources	Area (in sq.km)	
	North Bank	South Bank
Cultivated land	59.71	23.22
Wetland	2.87	0.13
River Channels	5.55	0.13

Results

- In the span of 34 years (1972 to 2006), continuous **erosional activity in both the river bank causes the bankline recession in the 20 km river reach in the downstream of Palasbari.**
- Total area of erosion in both the banks is estimated to be 96.52 sq.km, (31.52 sq. km is in the south bank and 65 sq. km is the north bank.)
- The average rate of erosion
In the South Bank - 0.93 sq.km per year
In the North Bank - 1.91 sq.km per year
- Average bank line recession
3 km in the north bank
1.6 km in the south bank



Discussion

- Cause of the erosion in both the river bank within the studied reach is because of the natural bottle neck (noodle point) developed in the upstream of Palasbari in the south and Soalkuchi in the north.
- Over the 34 years people are forced to leave the villages within the area of erosion and are being migrated to other places due of the loss of their houses and cultivated lands.
- Total settlement areas and cultivated lands within this zone of erosion are estimated to be 14.16 sq.km and 73.93 sq.km respectively.
- Effect of erosion on the road networks and embankments constructed for the flood protection are the major blow on the infrastructure facilities developed within the area.

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