



Present Condition of Near Estuary of Rupnarayan Right River Bank

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Abstract

The right bank of the Rupnarayan River near Tamluk town has been eroded over fifteen years. 51.19% (9.44 sq kilometers) of the areas of shoals and bank are low-lying area. Those are submerged in flow-tide. In 2012 the river bank is bolder clipped with geo textile. The lateral erosion was stopped. But the engulfed land is still not excavated from the river. Objectives: i) To prepare a map of temporal changes of the river bank near estuary.ii) To understand present situation of the study area. Methodology: The study has been done by both primary and secondary data. Primary data has been collected by schedule survey of 18 randomly selected households to recognize the problem of the area. To prepare temporal changes of the study area, several maps and images are used (i.e. Bengal Land Records Department 'Tamluk Block Map', Survey of India 73N/15, Survey of India 'Open Series Map' 73 N/15 and 73N/16 and IRS LISS-III Satellite image of February 2019).Findings : Maximum erosional incidents occurred in Purba Medinipur Part.

Key Words: Shoals, flow-tide, bolder clipping, geo textile, lateral erosion

River bank erosion is the threatened problem not only to our society but also to the nation. This erosion loss our agricultural lands, plantations, residencies, employments, agricultural productions and disturb the normal existence of life. In the year of 1995 Soyadighi, Biswas and Mathuri are badly affected by right bank erosion of Rupnarayan River. As a result one and half decade it erodes towards its estuary and makes itself wider. The right bank of the Rupnarayan river near Tamluk town has been eroded over fifteen years. Out of thirteen villages (Soyadighi, Biswas, Mathuri, Dhalhara, Khandagram, Pairatungi, Abasbari Char, UttarcharaSankarara, DakshincharaSankarara, Narayanpur, Totaberia, Mirpur, Baramritberia), ten (Soyadighi, Biswas, Mathuri, Dhalhara, UttarcharaSankarara, DakshincharaSankarara, Narayanpur, Totaberia, Mirpur, Baramritberia) have been partly eroded by intense flow of river water. Shoals are spread over the river. 51.19% (9.44 sq kilometers) of the areas of shoals and bank are low-lying area. Those are submerged in flow-tide. In 2012 the river bank is bolder clipped with geo textile by the irrigation department of Govt. of West Bengal. The lateral erosion was stopped. But the engulfed land is still not excavated from the river.

Objectives:

- i) To prepare a map of temporal changes of the river bank near estuary.
- ii) To understand present situation of the study area.

Methodology:

The study has been done by both primary and secondary data. Primary data has been collected by schedule survey of 18 randomly selected households to recognize the problem of the area. To prepare temporal changes of the study area, several maps and images are used (i.e. Bengal Land Records Department 'Tamluk Block Map', Survey of India 73N/15, Survey of India 'Open Series Map' 73 N/15 and 73N/16 and IRS LISS-III Satellite image of February 2019) Dumpy level and GPS Receiver has been used. Latitudinal and longitudinal location has been recorded byGPS Receiver (Germin HCx). Soil samples have been collected randomly for the study. Secondary data has been collected from Tamralipta Municipality office and several websites. Cadastral map is collected from DLRO, Tamluk, Purba Medinipur. To understand present landuse changes of the area, three mouzas (Pairatungi, Abasbari Char and Uttar Chara Sankarara) are selected randomly.Google Image also considered for the map making of the area. Statistical hand book is also considered for the study.

Table No. – 1

Maps and Images used to Study of River Bank Changes

Data Sources	Date of Survey/Imageing	Scale/Resolution
Survey of India 'Inch Map 73N/10	1931-32	1:63,360
Survey of India 'Open Series Map'73 N/15 and 73N/16	1989-90	1:50,000
IRS LISS-III Satellite image (L3-NF45J15-107-056-23Feb19 and L3-NF45J16-108-056-04Feb19)	2019	24 m (pixelsize)
Google image	2024	-

Origin and destination of the Rupnarayan:

The river rises as Dhaleswari in Chottonagpur plateau foot hills, north east of Purulia and flows slowly towards south east part of Bankura where it is known as Darakeswar. River Gandheswari, rising from Bankura District meets Darakeswar near Bankura town. After entering Hoogly District Silabati meets with it and form Rupnarayan. River Damodar through Mundeswari and Branch of Kangsabati i.e. Medinipur canal meet with it. It ultimately out falls into Hoogly river near Geonkhali. It flows 240 kilometers to join the Hoogly river.

Study Area:

The study area lies in between 22°23'N to 22°14'N and 87°55'E to 88°00'E, covering an area of 143.777 sq kilometers of Purba Medinipur (part of Tamluk-I, Tamluk-II, Nandakumar and Mahisadal blocks) and Howrah district. The study area is lying just before 4 kilometers from the estuary. The elevation of the area is 6 to 7 meters from Mean Sea Level. Tamluk is the District head quarter lying on the study area. At present Tamluk town contains five affected villages (Pairatungi, Abasbari Char, UttarcharaSankarara, DakshincharaSankarara and Narayanpur). Other affected villages are lying as rural urban fringe of the town. The area is also popular for paddy cultivation and plantation.

General Geography:

The altitude is 5.86 meter from MSL¹. Tamluk town is situated on the right bank of Rupnarayan River. The average annual temperature is 26.5°C to 27.0°C² and average annual rainfall is 1400 mm to 1600 mm³. Young alluvial (Entices) soil is present all over the study area⁴. As of the 2001 census of India, Tamluk had 45,830 population⁵. But in the case of 2011 census of India, Tamluk has 65,306 population⁶.

Economic activities of the river:

Boat is the most ancient means of transport. Boat can carry sand, brick, tile, rice, and other goods. A regular loading and unloading processes are happened in Narayanpur canal. Three ferry services are present in the study area – a) Mathuri to Jhumjumi, b) Tamluk to Amberia, c) Mirpur to Mayachar. Ferry service has been disturbed by the presence of shoals in the river. Fishing is also an economic activity present in the river.

Economic activities of the river bank:

Paddy is the dominant crop of this area. Aman and Boro practice are also present almost all the mouzas of the study area. In winter northern part of the study area produce flowers. Southern part produce vegetables, seeds etc.. 3.61 sq kilometers of land are under Orchard. It contains eucalyptus, Coconut, Palm, Bamboo grove etc.

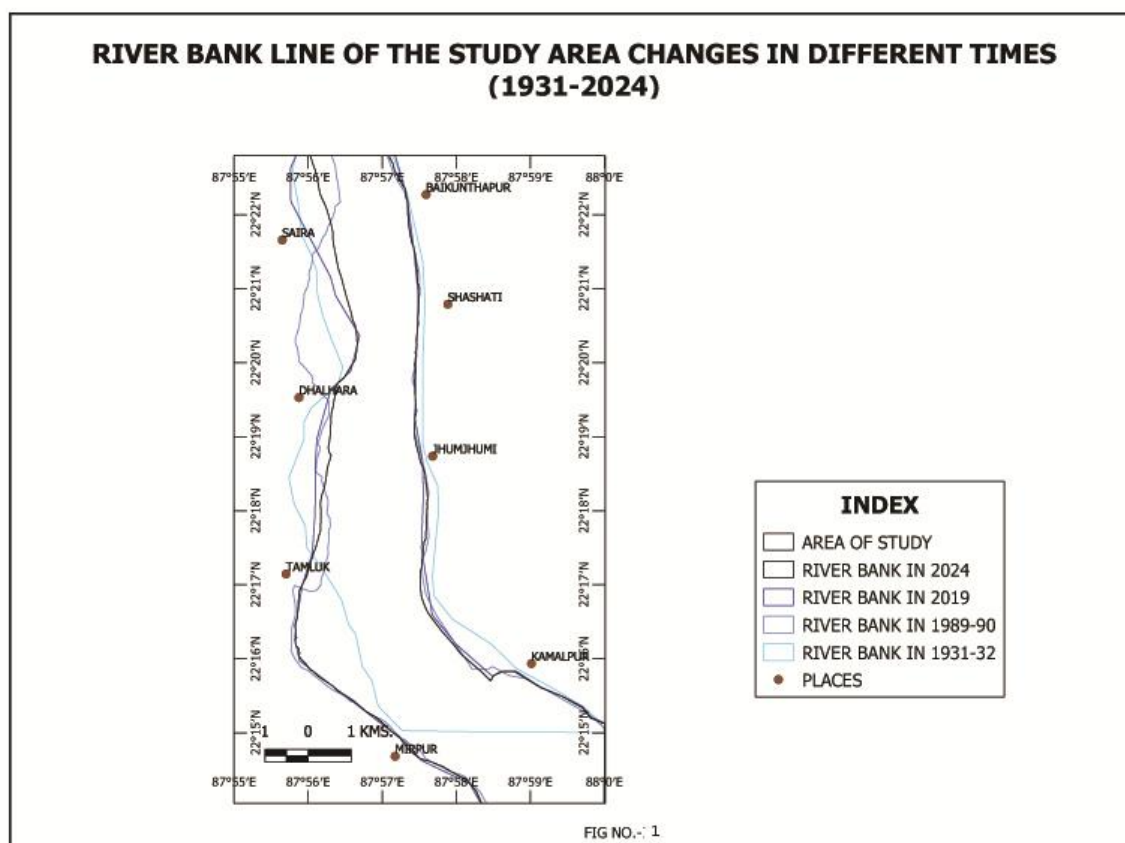
River bank line changes in different times:

Erosion and deposition depend upon the sedimentary load of the river flow.

Table No.-2

Erosional or Depositional Information of bank line of District Purba Medinipur and Howrah

Time span	Purba Medinipur	Howrah
	Erosion or deposition	Erosion or deposition
1931-32 to 1989-90	deposition	erosion
1989-90 to 2019	erosion	erosion
2019-2024	deposition	deposition



Area of land and river:

The study area covers an area of 143.77 Sq. Kilometers. In 1931-32 the area of river covers 32.88% (41.76 Sq kilometers), Howrah district covers 43.45% (55.19 Sq kilometers) and Purba Medinipur district covers 23.67% (30.06 sq kilometers) of the study area. In 1989-90 river covers 46.70% (32.48 Sq kilometers), Howrah district covers 40.64% (58.42 sq kilometers) and Purba Medinipur district covers 26.88% (38.65 sq kilometers) of the study area. In 1989-90 area of river 0.40% decreased with respect of 1931-32. Howrah district has loosed 0.55% of land and Purba Medinipur district has gained 3.21% of land. In 2019 area of river 0.34% increased with respect of 1989-90. Howrah district has loosed 3.00% of land and Purba Medinipur district has loosed 0.09% of land. In 2024 area of river 2.31% decreased with respect of 2019. Howrah district has loosed 0.30% of land and Purba Medinipur district has gained 1.99% of land.

Table No. 3
Areas of land and river

Land and River	1931-32		1989-90		2019		2024	
	Area in Sq kms	%	Area in Sq kms	%	Area in Sq kms	%	Area in Sq kms	%
River	41.76	32.88	46.70	32.48	47.05	32.74	43.75	30.43
Howrah District	55.19	43.45	58.42	40.64	58.21	40.49	58.64	40.79
Purba Medinipur	30.06	23.67	38.65	26.88	38.51	26.79	41.38	28.78
Total	127.01	100.00	143.77	100.00	143.77	100.00	143.77	100.00

Physical properties of the river water:

River water is muddy. Sun light can penetrate a little into the river water. Secchi disk reading reflects only 6.35 centimeters (2.5 inch). Whereas Oligotrophic (fresh water) reflects more than 4.88 meters (488 centimeters).

River channel geometry of the study area:

At present major water flows through the eastern part of the river. Eastern part is deeper than western part. The flows of ebb-tide and flow tide are more effecting in eastern part of the river.

Findings :

1. Maximum erosional incidents occurred in Purba Medinipur Part.
2. River water is muddy. Sun light can penetrate a little into the river water. Secchi disk reading reflects only 6.35 centimeters (2.5 inch).

Suggestion:

Erosion and deposition of the river are the natural process. Natural disaster happened by the nature. Disaster Mitigation is defined as sustained action that reduces or eliminates long-term risk to people and property from natural hazards and their effects. It describes the ongoing effort at the federal, state, local and individual levels to lessen the impact of disasters upon our families, homes, communities and economy.

References:

1. <http://www.panoramio.com/photo/47364253>
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4. *ibid.*
5. Purba Medinipur, District Statistical Handbook, Bureau of Applied Economics & Statistics, Govt. of W.B., 2006.
6. *ibid.*