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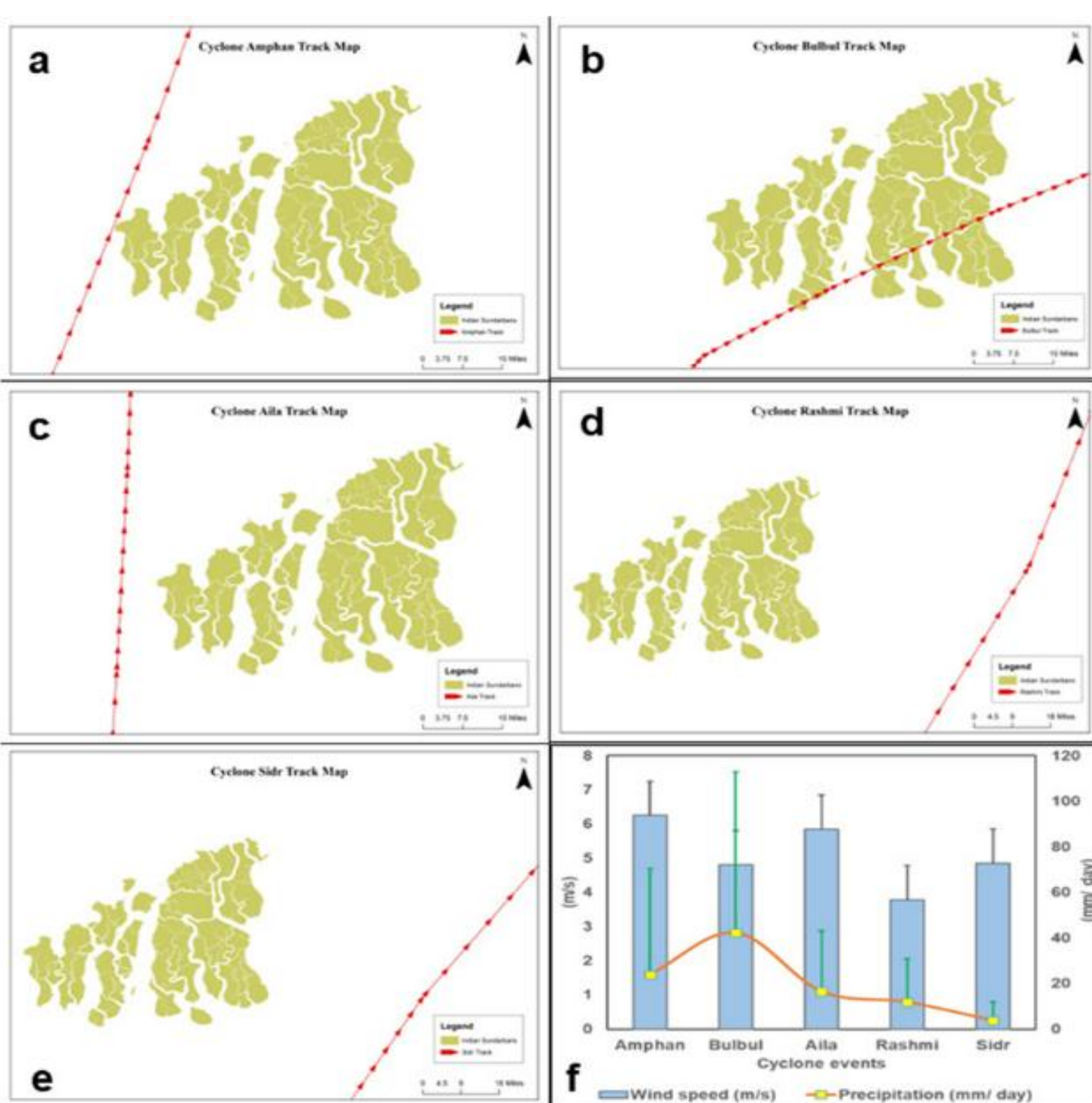
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INTRODUCTION

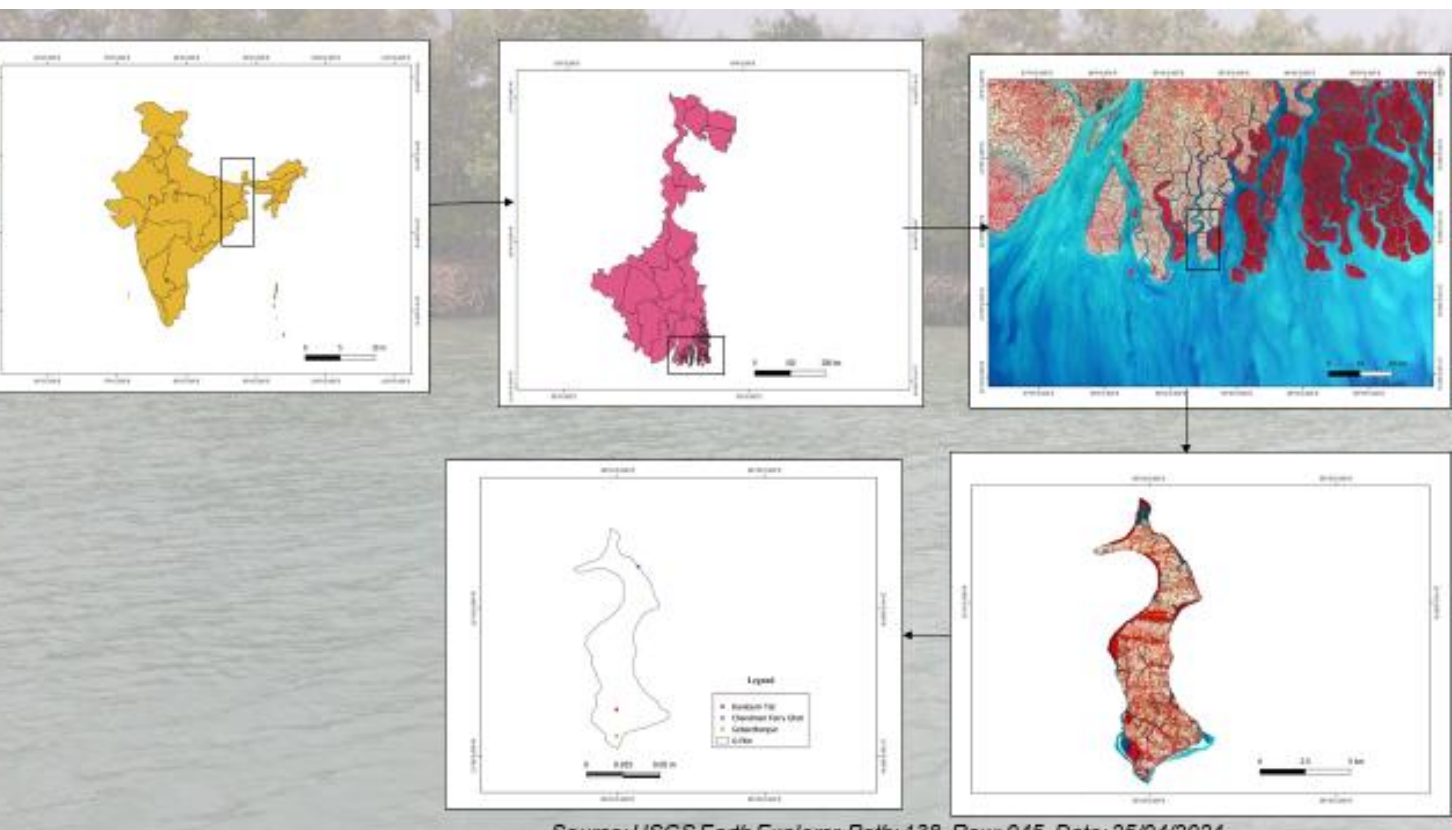
The G-Plot Island, Patharpratima C.D block, Indian Sundarbans, lie along the western bank of the Saptamukhi River, opposite the Dhanchi forest.

Area:40.807sq.km.,Population:28,992,Literacy Rate: 84.25%, Total houses:6356, Total workers:14939, A highly cyclone-vulnerable zone. **Objectives:** I) To assess the impact of cyclones on the island over the past 20 years. li) To study the effect of Climatic calamities; majorly cyclones on the residents of the area.

Major cyclone tracks pass through Indian Sundarbans.



Study Area: G-Plot Island is part of the Patharpratima block in the south 24 parganas district of West Bengal. Located on the western bank of the Saptamukhi River, G-Plot Island is inhabited, in contrast to the Dhanchi forest on the river's eastern bank.



METHODOLOGY

1. Collection of satellite images of different years from USGS Earth Explorer, Landsat 4-5 and Landsat 8-9
2. Field visit and survey of the local residents via interview
3. Analysis of the obtained data

RESULTS & DISCUSSION

Evolution of G Plot, 2004-2024

Area Eroded from 2004-2024

Area of the Island in 2004 was **40.386 sq.km.** While in 2024 it is **40.807 sq.km.**

- A decrease in area has been found to have occurred in 2020, which equalled **39.491 sq.km**, which can be related to Amphan cyclone, causing large loss of land.

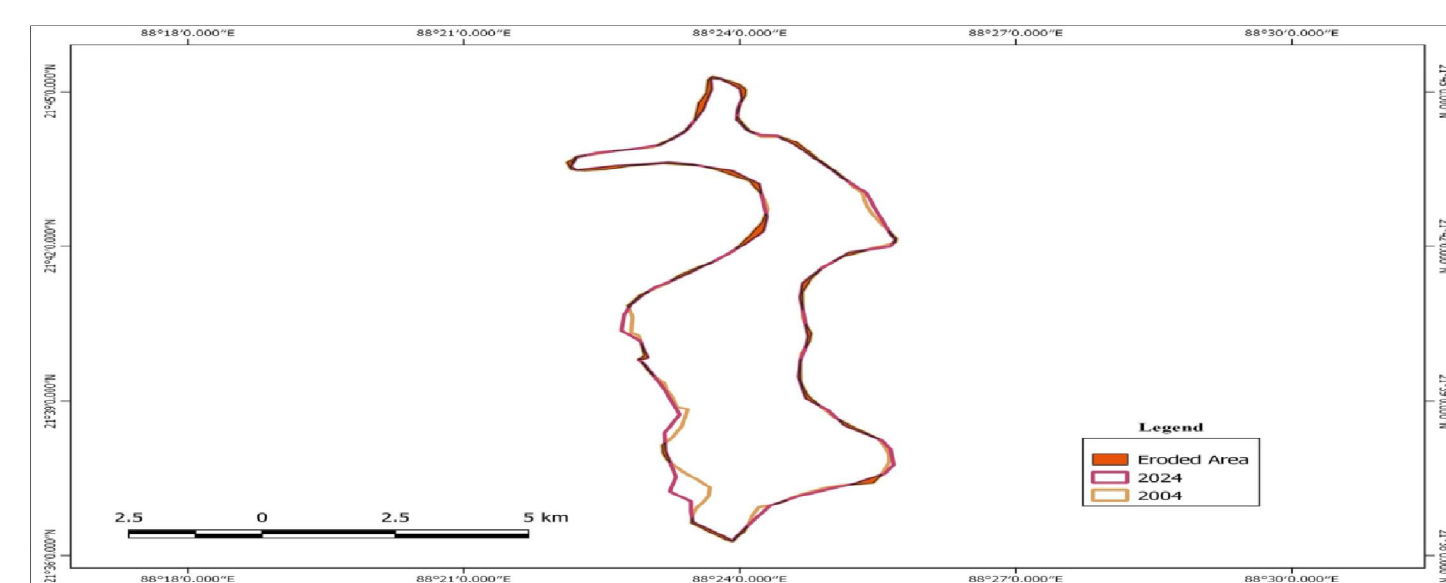
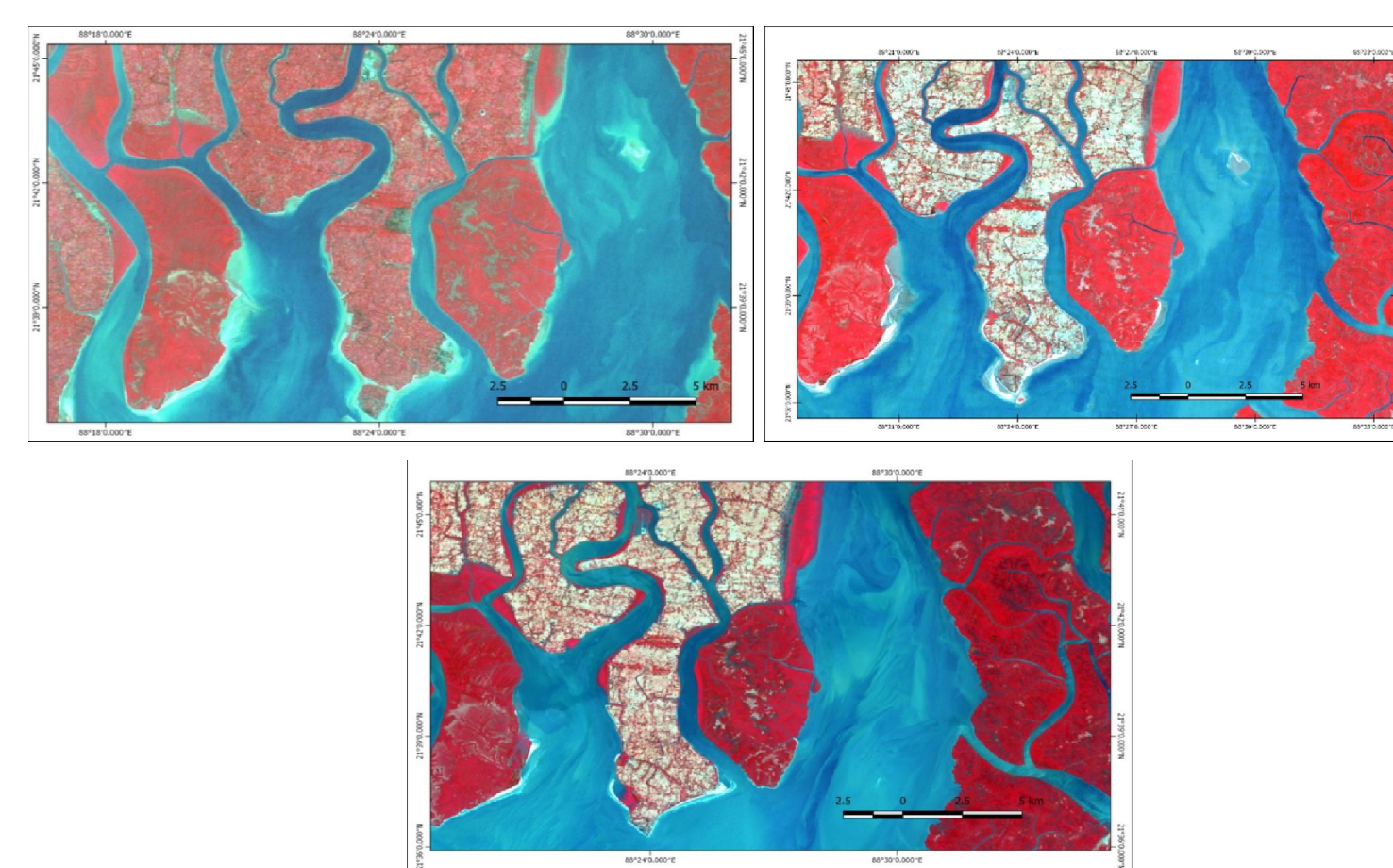


Fig.1: Area Eroded from 2004-24



Source: USGS Earth Explorer, Path: 138, Row: 045, Date: 04-11-2004, 21-01-2010 & 25-04-2024

- The probable cause of such deposition in this section might be due to the eroded materials from the northern section of the island is filling up the depression in the section due to the nature of flow of the river and tides

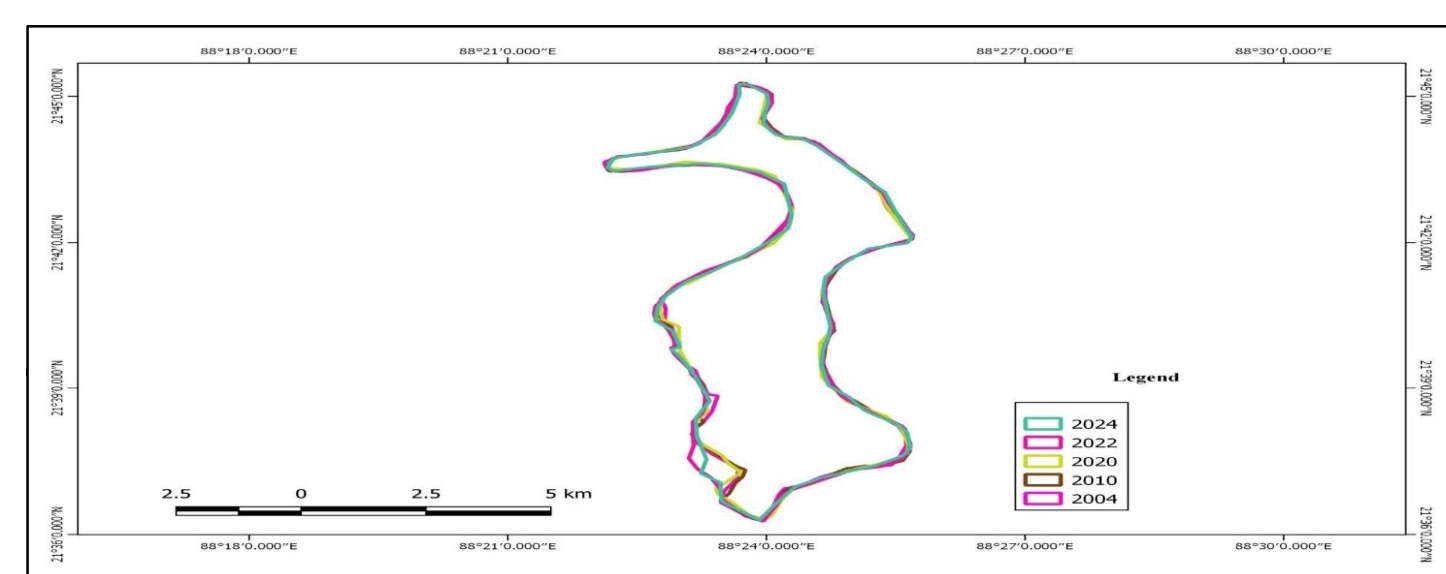


Fig 2: Evolution of G Plot, 2004-2024

Table 1: Land Use Land Cover Classification, G-Plot,2004- 2024

Categories of LULC	2004 (Area in ha.)	2024(Area in ha.)
Mangrove Vegetation	382.52	524.21
Non- Mangrove Vegetation	627.18	508.59
Fallow Land	347.85	749.12
Water Body	108.52	115.85
Sandbar	25.32	72.86
Agricultural Land	4699.52	3897.25
Fisheries	12.51	52.96
Settlement	142.59	185.92

Source: Computed by the authors using QGIS from USGS Earth Explorer, 2024



Spots on the way to G-Plot: Earthen embankment; weak embankments; Local people get down from ferries in these unstable banks.

Everyday Life: All essential items for living, including grains and vegetables are taken from the mainland and carried by ferries. Even vehicles like bicycles and bikes are also carried by these ferries.



Table2: Characteristics of Soil Samples, G-Plot

Area	Time	Date	Tide	pH	Temperature (°C)
Gobardhanpur (21° 36.931'N, 88°24.397'E)	6.37 p.m.	14-05-2024	Low	6.67	29.3
	6.40 p.m.			7.95	29.4
	6.42 p.m.			6.68	29.6
Buraburi Tat (21°37.956'N, 88°23.135'E)	7.30 a.m.	15-05-2024	Low	6.7	30.2
	7.35 a.m.			6.67	29.5
	7.40 a.m.			6.66	30.3
Chandmari (21°43.732'N, 88°24.870'E)	1.30 p.m.	15-05-2024	High	6.48	33.5
	1.32 p.m.			6.57	35.2
	1.34 p.m.			6.45	34.8

The soil in this region is likely to be dynamic, influenced by tidal fluctuations, temperature changes, and pH variability. The slightly acidic to alkaline pH and the temperature during tidal cycles suggest the presence of moderate salinity which could impact plant growth and microbial activity.

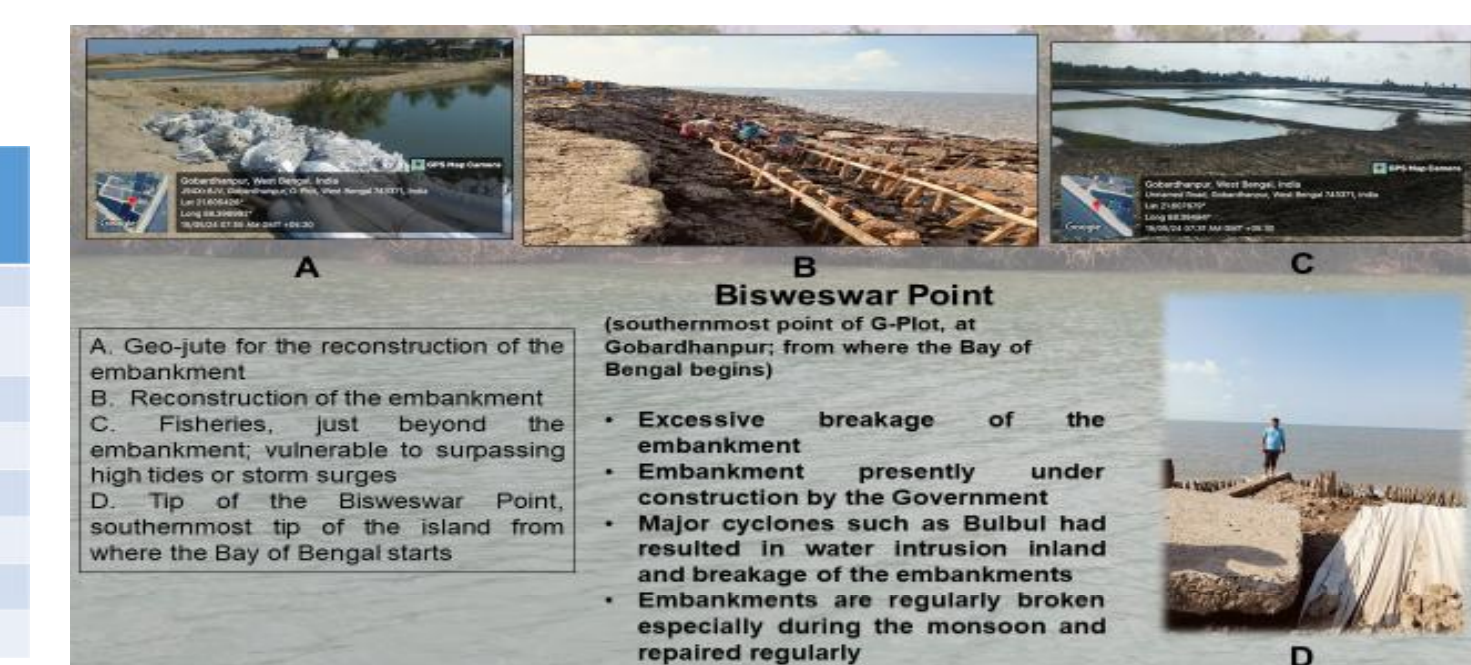
Table 3: Characteristics of Water Samples, G-Plot

Area	Time	Date	Tide	pH	Temperature (°C)	Salinity
Gobardhanpur (21° 36.931'N, 88°24.397'E)	6.30 p.m.	14-05-2024	Low	8.03	29.3	31
	6.35 p.m.			7.99	29.3	30.9
	6.47 p.m.			7.95	30.3	30.1
Buraburi Tat (21°37.956'N, 88°23.135'E)	7.34 a.m.	15-05-2024	Low	8.31	31.9	30.2
	7.38 a.m.			8.35	31.8	30.5
	7.43 a.m.			8.2	31.6	30.4
Chandmari (21°43.732'N, 88°24.870'E)	7.49 a.m.	15-05-2024	High	8.08	31.3	30.3
	1.30 p.m.			7.83	31.7	28.4
	1.38 p.m.			8.02	34	10.9
	1.45 p.m.			7.89	32.9	28.4

- These values indicates expected range for marine-influenced environments (brackish to marine water). Salinity values suggested that the area experiences significant seawater influence, especially during high tide when sea water pushes inland.

Comparison Among the Perspectives in Buroburi Tat, Gobardhanpur and Chandmari Ghat

Buroburi Tat	Gobardhanpur	Chandmari Ghat
<ul style="list-style-type: none"> Cyclones have increased frequency in the present times and affected the people and their housing infrastructure Excessive breakage of the embankment, presently being reconstructed (tides) Livelihood changes: Agriculture to Fishery (increased production only due to fertilizers) Crops: Paddy and local vegetables, mostly apices Civic Amenities: Tubewells, Primary health centre, Cyclone Shelter Occupations: Kachhato Pucca Houses Houses near to the river have been abandoned 	<ul style="list-style-type: none"> Cyclones affected: Amphan and Yaas, river water surpassed embankment, saline intrusion Sweet water fisheries damaged Lots of families displaced constituting 200 bighas of land Main occupation: Fishing in river or in ponds, common varieties include "boat" fish (Koi, Tilapia) and "bhatki" fish (Lates calcareus) Subsistence Agriculture: Crops: Paddy and local vegetables salt production stopped due to sever at modern technologies and availability Piped as well as tubewell water, no such domestic purification 	<ul style="list-style-type: none"> Cyclones affected: Aila, Amphan, Yaas, Excess water through flood are sent back to the river by pipes However, excess salt intrusion have permanently damaged the agricultural fields Cyclone affected people given pucca houses by the government under Pradhan Mantri Awas Yojana Two cyclone shelters: Indrapur and Despur Occupations: Fishing via trawlers and local boats is the main occupation; Seasonal agriculture (monsoon); paddy and local vegetables Civic Amenities: Deep tubewell for water; pipe water planning



Comparison Among the Perspectives in Buroburi Tat, Gobardhanpur and Chandmari Ghat

CONCLUSION

This region, being located in a cyclone vulnerable area, will always be vulnerable to erosion and flooding. However such incidents can be reduced by plantation of mangroves. Development of this area lies in the development of external transportation in this region.

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