

Annex 9 Pilot location

Location 1: PATIBUNIA

Context of taking up the work

Patibunia is under Namkhana block. It is near Mousuni island. Bartala river is on the western side of Patibunia. By shoreline monitor software it is found that the rate of erosion of coastline is about 1 m/year. On top of this, the channels and shoals in the Bartala river migrate eastwards (~4-8 m/year). As a result, the southern tip of Mousuni island disappeared (800 meter since 2001). This leaves Patinbuya coast more exposed to wave action. The present work is taken on Bartala river.

Expectation coming years/decades(s)

- a supra / intertidal mangrove-fringed bar exists west of Patinbunia coast, which is disappearing (>200 meters in the past 15 years). At this rate, the bar will disappear within 20 years. This will lead to higher flow velocities at the dyke toe, potentially destabilizing any structure.
- The area south of Patinbunia coast is an open embayment that can fill up with sediments. An extensive intertidal area exists, protecting the section from undercutting and reduces wave-driven erosion for now. This suggests especially the east of Patinbunia coast will be stable over longer timescales. Its western sections will likely remain erosive, and become more erosive in the future (when the protective intertidal area has disappeared).
- Possible causes of embankment failure:
 - mangrove forest has been cut away (this took away the protection against hydrodynamic forces and exposed the tidal flat);
 - water level results from tide + set-up and waves on top.
 - during cyclone events this site is very exposed;
 - existing tidal flat continues to erode.
 - the embankments failed due to wave attack (wind and swell) and no foreshore protection.

Proposed works

- construction of three groynes of 150 m long as shown in drawing. Initially the length will be 75 m and after observing the effect of groyne length may be increased further.
- Permeable groynes of eucalyptus stems/bamboo filled with brushwood (water should be able to go through).
- if the foreshore is developed then arrangement will be made to create mangrove plantation in the foreshore (green).
- in the existing foreshore sediment trapping unit will be created.
- once sediment is deposited mangrove plantation will start on the deposited sediment

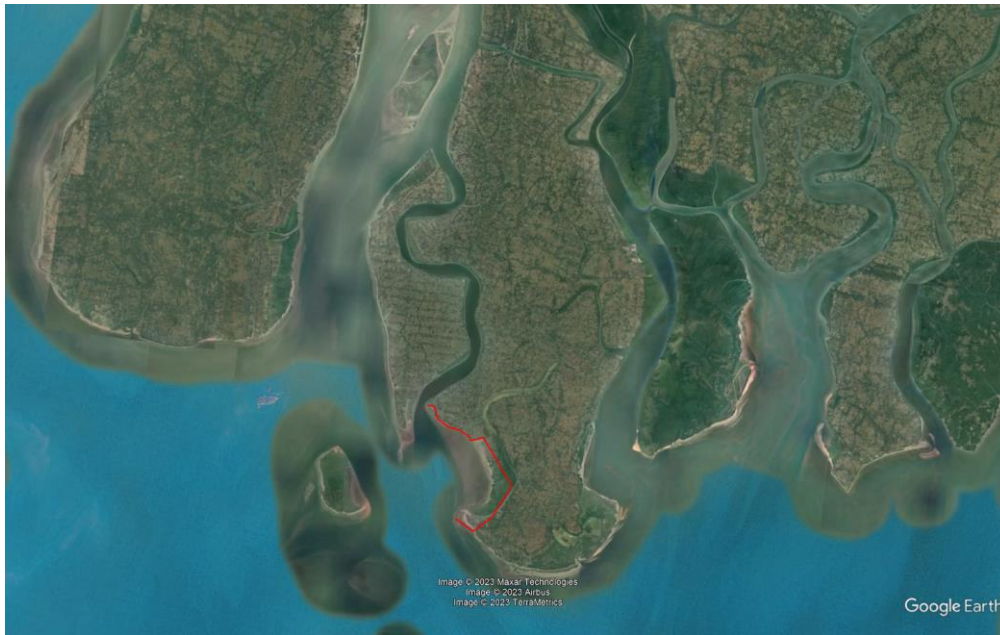


Figure 1: location of the 1st pilot location Patibunia (in red)

Location 2: GOBINDAPUR ABAD

Gobindapur abad is in the Brajaballavpur island under Patharpratima block. The island is surrounded by Curzon creek, Walsh creek and Saptamukhi river. By shoreline monitor software it is found that the rate of erosion of coastline is about 1 m/year. The present work is taken on Curzon creek. Curzon creek (the channel along gobindapur) has been eroding for the past 100 years. The other river that saptamukhi bifurcates into (walsh creek) is strongly filling in. This probably leads to more tidal discharge through curzon creek, and therefore erosion.

Saptamukhi channel splits into Curzon creek and Calsh creek. the width of Walsh creek has decreased from 1200 to 600 meter in the past 30 years. Curzon creek has been expanding in the past 100 years, but does not seem to have grown much wider in the past 30 years.

Expectation coming years/decades(s)

- erosion of Curzon creek likely results from tidal amplification.
- the tides in the Saptamukhi River increase in the landward direction.
- historically, the tides were dissipating in the landward direction.
- tides have amplified in the last decades / 100+ years.
- tidal amplification may lead to more tidal discharge (causing erosion) and to higher water level fluctuation (destabilizing river banks).
- during storm and cyclone events this site is very exposed to high waves with high wave energy from southern direction.
- the wave impact on the embankment is probably high so it might be crucial to protect the foreshore.
- the dyke revetment must be of very good quality to withstand these heavy loads. This results in high construction costs and maintenance costs. A NbS which causes wave damping can be very cost-effective here.

Proposed works

- The existing embankment will be made strong to withstand the wave impact (grey solution) since there is no foreshore, it will be developed by jute bag filled with brick bat (grey-green).
- if the foreshore is developed then arrangement will be made to create mangrove plantation in the foreshore (green).

- working area is from ch. 3750m to 5250m i.e., 1500m

