

# VIDYASAGAR UNIVERSITY



## PROJECT REPORT ON

### COASTAL EROSION DIGHA & ADJACENT AREA, PURBA MEDINIPUR

DIGHA :: PURBA MEDINIPUR :: WEST BENGAL

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**DEPARTMENT OF GEOGRAPHY**  
**NANDIGRAM, PURBA MEDINIPUR**

**TO WHOM IT MAY CONCERN**

This is to certify that Sri/Smt. Subhajeet Sahoo  
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1990666 year 2020-2021 submitting a field  
report on Coastal Erosion in Digha & Adjacent Area under my guidance & supervision  
for the partial fulfillment of bachelor degree of science of his/her  
paper C-14-T Scheduled & prescribed by the Vidyasagar University.

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**Examined**

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# INTRODUCTION

Coastal Zone is transition area between Land and water which terrestrial environments influence marine environments and vice-versa (Carter, 1989). Coastal Zone is the dynamic Junction of ocean, atmosphere and land undergoes continuous geomorphological changes. in response to natural forces and man-made activities. Natural processes like wind generated waves, tides, currents and continental drifts are always at work and induce major geodynamic changes over a period of time. Coastal zones almost everywhere have always been densely populated and are nuclei for urbanization, industrial growth and intense agricultural activities. It frequently tends to change from its original environment due to natural or man-made activities.

Examined

# COASTAL EROSION IN DIGHA AND ADJACENT AREA

## CONCEPT

Digha is one of the largest sea resort town located at Purba Medinipur district of West Bengal along the East Coast of India at latitude  $21^{\circ}37'25''$  N and  $87^{\circ}31'35''$  E. Facing a long history of erosion and has been engineered extensively since 1970s. It extends for 5.45 km along the Medinipur coast. Beaches, dunes, marshes, barrier bars or is land act as natural physical barriers against storm damage along the lowland coastal plain. Shoreline developments of Digha coast has intensified coastal erosion, altered the hydrology of sand dunes and wetlands, and also disrupted natural processes. The protective structures along the shoreline of Digha coast typically built to dissipate the energy of storm waves in turn disrupt the natural process of sand replenishment, and lead to further erosion in the nearby unprotected areas.



According to previous report, during powerful cyclonic storms and high tides (High Spring tide) the wave of sea water rises above 5-50 m resulting into formation of vertical slips due to sea erosion rain cuts with erosion through out its length from old Digha Mohana (3 km) sea dyke from Shankarpur to Tajpur (3.7 km) in Ramnagar and Digha ps.

## OBJECTIVES

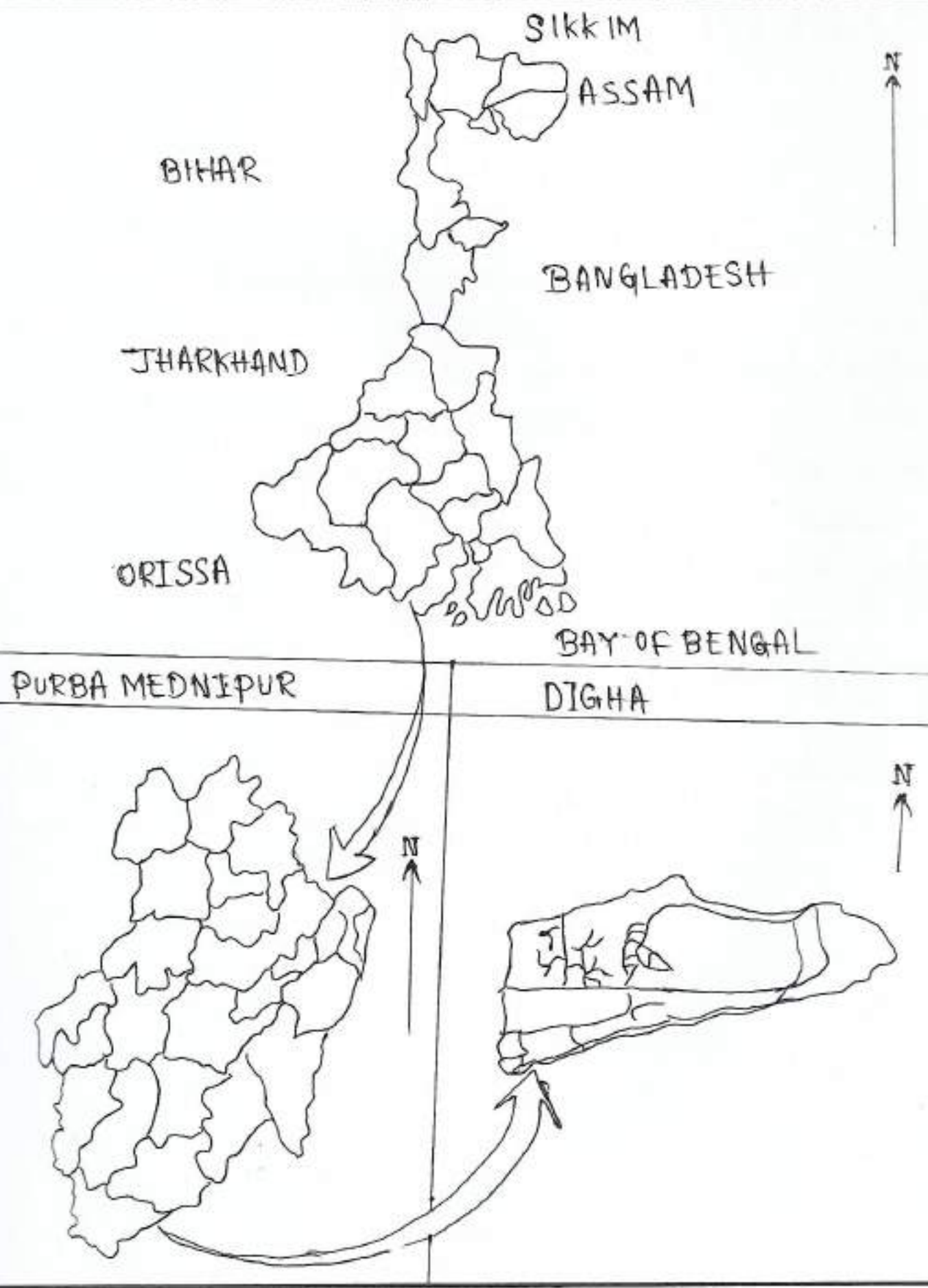
The major objectives of this paper are,

- To identify the causes that hinder behind the shoreline change during 1851-2015
- To delineate the changes of land use and land cover pattern due to erosional activity
- To highlight the socio-economic impact for such changes.
- Suggest remedial measures for erosion control for this coastal zone.



# LOCATION OF REGION

## WEST BENGAL



# CAUSES OF COASTAL EROSION IN DIGHA AND ADJACENT AREA

During this project investigation, I have asked some respondents who have answered positively about the reason of the coastal erosion. They have given various answers to my question. From their information I have divided the causes into two categories. These are Natural and anthropogenic causes. According to them, cyclone (27.27%), wave activity (18.18%), sea level changes (18.18%), deforestation (13.64%), engineering structure (11.36%) and others (6.82%) are responsible for coastal erosion. Also some respondents have denied to make any comment (9.55%).



# NATURAL CAUSES OF COSTAL EROSION

## TIDE/WAVE ACTIVITY

The phenomena of tide and wave are very significant facts in the ocean area. The origin of the tides is in the sea but tidal effects travel up estuarine rivers. The tides have characteristic periodic variation. To such periodic variations are easily seen in lunar semi-diurnal tides and lunar fortnightly tides; there are also other short and long period tides. There are also other the mean range of the during Spring at Digha when the maximum erosion is done and falls with the ebb tide. During the cyclone situation in the coast of Digha region, maximum erosion and damages are occurred along the coastal beaches are estuaries and the creeks

## CYCLONE

Cyclone disturbance along the Digha Coast are found maximum in August September months. The destructive power of revolving tropical cyclones with strong South West monsoon winds hit the Digha Coastal tract frequently during the mid-rainy season. In this period the Joint hazards of winds (8-170 km/hour) waves



waves (4.5m heights) and tides (rises up to 5-6m) cause greatest erosion in a single season. So far as we got the record from the Coastal zone research unit is known that, high erosion prevails in Junput with a rate of 10m/per year (S. Mishra, 2004)

## SEA LEVEL CHANGE

Rise of Sea Level (due to global warming environmental pollution, wetland capture etc.) is also affecting such severe erosion in the Coastal tract of Digha, West Bengal. This uprising Sea Level is allowing the bay waves to break closer in shore at present along Junput Digha beach zones. This is more active in the region of old Digha township area and also in the Bay of Sea-hawk hotel region.



# UNNATURAL CAUSES OF COSTAL EROSION

## EROSION DUE TO ENGINEERING STRUCTURE

Digha Coast of west Bengal is partially protected by boulder paved seawalls to prevent the erosion. Erosion is being occurred in this side the beach area is gradually sinking (20 cm/year) along Digha zone. A long boulder wall has been built but that is not enough. It is also a cause of coastal erosion.

## DEFORESTATION

Vegetation of Digha has already been destroyed due to huge constructions and climatic changes. It has direct impact on coastal vegetation. Several factors have direct impact on coastal interference: industrialization, population, waste disposal, harbours, roads, sand mining, sea facing, commercial or social forestry, construction of resorts and beach tourism. These cause destabilization of coastal sand dunes and severely influence the dune ecosystem. In these places, the vegetation itself is the target of exploitation. It is the source of fuel wood and charcoal.

# CAUSES OF COSTAL EROSION







### III DISTURB LIVELIHOODS

The occupational structure of the displaced population has undergone a major change. Majority population has involved in primary activities i.e. fishing and agriculture. With the loss of agricultural land the people who were depend on such income source had to look for another alternative. Fishing is still popular but different forms. Fish culture and dry fish method of cure the new attraction, traditional method of capturing fish is losing its stand. There were quite a number of reasons enlisted by the respondents for such a kind of shift, like decreasing marine fish catch, dominance of mechanized etc.



# EFFECT OF COASTAL EROSION





# MANAGEMENT OF COASTAL EROSION

## I. CONSTRUCTION OF GROYNES

Groynes are barrier or walls perpendicular to the sea, of any mode of concrete, rock or wood. Groynes are extremely cost-effective coastal defence measures, requiring little maintenance and are one of the most common coastal defence structures.

## II. CONSTRUCTION OF SEA WALLS

Sea walls refer to a type of vertical barrier that separate the land from the sea. This is especially important during storms where waves have high energies. They can be made of concrete, rocks or wood. The walls can be slopping or vertical. Although seawalls are expensive to build and maintain. Few years back an embankment was constructed by govt from old diha to New diha with the help of rocky boulders.



### iii) REVETMENTS

This is a sloping feature which breaks up or absorbs the energy of the waves but may let water and sediment pass fined into the beach which wooden slats between. Modern revements have concrete or shaped blocks of stone laid on top layer of timber material.

### iv) MONITORING COSTAL EROSION

Shoreline Mapping, Remote Sensing, Beach profiling Survey, Aerial photographs methods, helps to monitoring coastal erosion.

# MANAGEMENT OF COSTAL EROSION



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# SUGGESTIONS

Keeping in mind the above finding / problems, some suggestions are recommended for the development of this area along with an assessment of this area along with an assessment of the resource potentialities for the economic revitalization of the area. These are as follows.

1) Regular maintenance of embankments is a must. Embankments should be repaired much ahead of rainy season. Ad hoc measures need to be curtailed as far as possible. Strict engineering norms must be followed at construction phase. As embankments often collapse due to faulty engineering methods.

2) Forestry should be increased not only along the shoreline but also in the uplands of inland sites. It is effective for protection from coastal erosion.

3) Maintain the CRZ rules proposed by the Government of India.

4) The running of the cars on the beaches should be banned for prevention of coastal erosion.

5) Forecasting of cyclone should be made for this area to minimize the damage to resources and lives. Some rescue must be

built in such hazardous zone to give quick shelter the victims, Delineation of Coastal buffer zone is to be completed and a quick communication system is also to be made to connect safe and buffer zone.

b) During the cyclone, the Gort. should taken necessary steps to rescue to vulnerable men. Also they should build house for homeless people.



## CONCLUSION

Therefore on the basis of the above analysis it can be stated that management of coastal erosion of the most complicated and planning of several activities in a co-ordinated manner and thereby helping in sustaining the natural resources and the long-term economic growth of our study area. The coastal areas exhibit a variety of specialized ecosystems some of which. variety of specialized ecosystems. Some of which variety of specialized ecosystems. In the land part of coastal area terrestrial activities are predominant and they have tremendous impact on the quality of coastal erosion and play a vital role in the development of natural resources - unless land-based and sea-based activities are properly integrated and activities are made compatible to each other, the goal of sustainable development is difficult to attain.



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