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COASTAL EROSION AND MANAGEMENT: A CASE STUDY OF DIGHA, EAST MEDINIPORE DISTRICT

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Abstract:

The landward displacement of the shoreline caused by the forces of waves and currents is termed as coastal erosion. Coastal erosion occurs when wind, waves and long shore currents move sand from the shore and deposits it somewhere else. The sand can be moved to another beach, to the deeper ocean bottom, into an ocean trench or onto the landside of a dune. The removal of sand from the sand-sharing system results in permanent changes in beach shape and structure. The impact of the event is not seen immediately as in the case of tsunami or storm surge. But it is equally important when we consider loss of property. It generally takes months or years to note the impact of erosion; therefore, this is generally classified as a "long term coastal hazard". The present paper attempts to find out the scenario of coastal erosion and its management of Digha coast, east Medinipore, West Bengal.

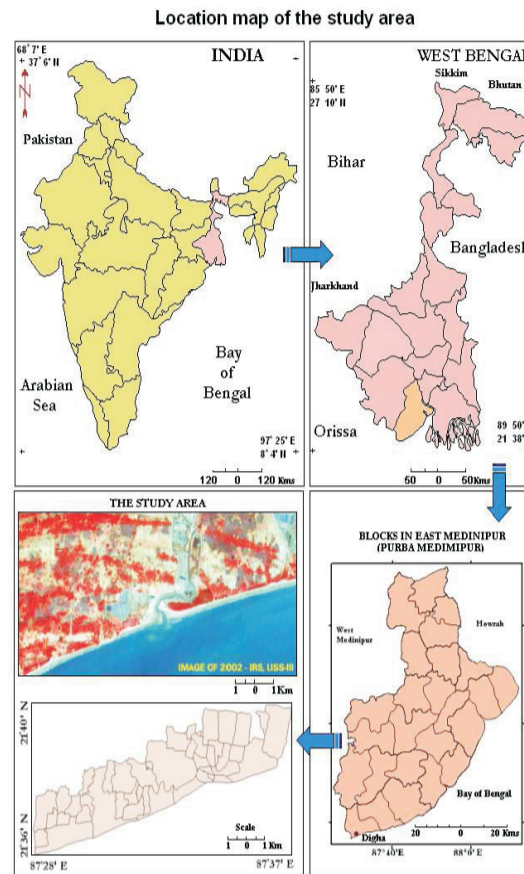
KEY WORDS:

Coastal Erosion, Management

INTRODUCTION

Digha's old beach isn't as wide as it used to be due to heavy soil erosion. Big stones and concrete steps are used to hold together the beach. Another problem is the record number of tidal waves that have caused many of the unplanned shacks and smaller hotels to succumb to the sea. Since it is one of very few popular beaches in West Bengal, it gets overcrowded, especially during the cooler winter break. A new beach has been developed at new Digha which is about 2 km from the old beach. This new beach is not only bigger than the old one, but might be considered a better one. It is clean and well-maintained and is not surrounded by a congested locality like the older beach. There are hotels within a walking distance from the beach here. The locality itself seems to be better planned. But the major problem in this area is coastal erosion. Proper management can reduce the chances of coastal erosion.

LOCATION OF THE STUDY AREA:



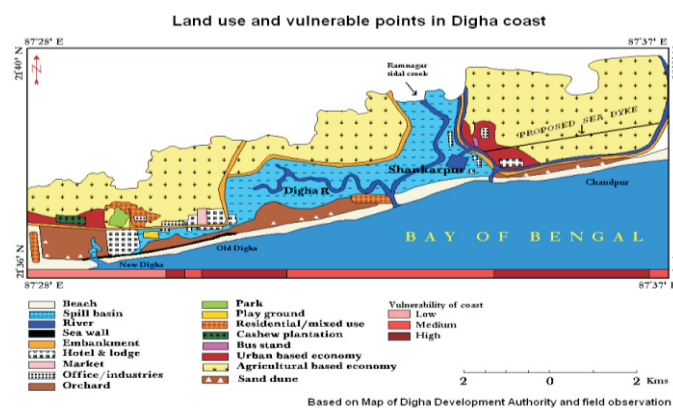
DATASOURCE

This work is based on primary data obtained from Questionnaire survey, interview, field visit and secondary data is obtained from Government and Non-Government office.

METHODOLOGY:

Several methods of shoreline shifting measurement are available. Depending upon available techniques, requirements, space and time considerations, each has its limitations and error. In general, calculation of long-term rates of shoreline change have relied on accurate positioning of a tidal datum, usually mean high water (MHW), on a map utilizing cartographic data.

LAND USE AND VULNERABLE POINTS IN DIGHA COAST:



**FACTOR
INFLUENCING**

THE COASTAL EROSION

• **Sand sources and sinks:** Beach material can vary in size from very fine sand (0.005 cm) to small pebbles (1.5 cm). Sand is brought to the shore from the continental shelf, rivers and eroding cliffs, sand dunes, as well as from other beaches through the action of long shore currents.

Sinks for the sand include continental shelf accumulations of sand that are in water at depths greater than 30 meters (100 feet) and sand that is carried into deep ocean canyons. This sand is below the "reach" of the waves and cannot be moved and returned to the beach. In addition, sand that is blown inland is also lost from the beach.

Rising sea level: To assess the scope of changes in sea level, scientists have developed methods to interpret the geologic record left by prehistoric events.

COASTAL MANAGEMENT

In order to provide a comprehensive guide to the options available for the management of coastal erosion all principle coast protection and erosion management techniques are covered. It must be recognized, however, that finely all of these can be damaging to the natural environment, to a greater or lesser degree, in inappropriate situations. The inclusion of any particular approach herein does not, therefore, indicate that it is, necessarily, environmentally sensitive, nor are universally appropriate as a means of managing erosion. Rather, the summaries highlight and encourage the pursuit of good practice, from an environmental perspective, which ever approach is deemed necessary by the circumstances concerned. The various approaches to management of coastal erosion in beach and dunes are as follows:

1. ADAPTIVE MANAGEMENT
2. DUNE GRASS PLANTING
3. DUNE THATCHING
4. DUNE FENCING
5. BEACH RECYCLING AND REPROFILING
6. SAND BAG STRUCTURE
7. BEACH NOURISHMENT
8. GABION REVETMENT
9. ARTIFICIAL HEADLANDS
10. ARTIFICIAL REEFS
11. NEARSHORE BREAKWATERS

PICTURES OF COASTAL MANAGEMENT



PICTURE: 1



PICTURE: 2

CONCLUSION

A comparative analysis of physical processes among Old Digha, New Digha, and Shankarpur-Chandpur shows that the erosion is more active and intensive at the coast of Old Digha. The shore normal current can effectively reach the coastal embankment on narrow beach with high energy plunging occasional surging breaker daily at high tide and takes huge amount of sand back to mid ocean causing the lowering of beach. The difference of elevation between coastal land and beach is increasing at a faster rate, also exposing the base of the coastal cliff due to attack of sea wave. In New Digha comparatively low rate of erosion is characteristic due to gentle slope of beach, low energy spilling breaker and wider beach. The swash can not reach up to the coastal embankment with high energy. In Shankarpur East upto Jalda, the condition is between that of Old and New Digha and due to impact of wave at a high angle here, the erosion is more. Due to moderate wider beach with gentle slope the spring tide reaches the unprotected coastal cliff as a result high rate of erosion occurs. Part of Digha planning area from new Digha Youth Hostel to Hotel

sea Hawk-Barrister colony may be declared. as CRZ-III according the guidelines of Ministry of Environment and Forest, Government of India and the rest should be categorized under CRZ-II. The area between 200 to 500m may be allowed as a restricted area for multi storied buildings. In this area the buildings may be constructed only with the prior permission of Ministry of Environment and Forest, Govt. of India and it should not more than 7.5m tall. A long continued and intensive investigation is needed to understand this interplay between coastal and sub-aerial process in order to propose a rational management plan for reduction of erosion or damage.

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