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SUSTENANCE OF EMBANKMENTS IN PROTECTING THE COASTAL ISLANDS- A CASE STUDY IN BAKKHALI, INDIAN SUNDERBANS

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India loses hectares of land every year due to coastal erosion. West Bengal has the highest percentage of eroding shoreline (36%) followed by Odisha, Kerala and Andhra Pradesh. Coastal islands of Indian Sundarbans have faced severe cyclonic effects of Bulbul (2019), Amphan (2020) and Yaas (2021) triggering embankment breaching and salt water intrusion hampering livelihoods. Bakkhali, a coastal tract of West Bengal lies next to Bay of Bengal. The assessment is to examine the suitability of embankments in protecting the coasts and restoring the coastal islands of Bakkhali. Quantitative methods such as measuring the embankments using clinometer, assessing the embankment design scenario, geo-spatial techniques to detect the areal changes were undertaken. A beach profiling was done to observe the effects of coastal erosion on beach with the help of dumpy level. Qualitative study in the form of interview was undertaken on residents (N=50) regarding the sustenance of embankment. Concrete embankments at Kargil beach with slope 13.5o towards sea and 4.3o towards land whereas concrete with earthen embankment (geojute) was found to be 11.5o towards sea and24.5o towards the land. The coastal configuration of Bakkhali shows an interesting erosion and accretionary behavior at two adjacent sections unlike the other islands of Indian Sundarbans. An area of3.32sq.km has been eroded due to erosive actions of wave and storm surges. Proper structural concrete embankments are demanded by the locals. Armored concrete embankment protected by vegetative wall (made of mangrove and Acacia nilotica, commonly known as Babla tree) will be beneficial to cope up with the coastal erosion and further studies also need to be conducted in restoring the coastal islands.
Keywords: - Coastal erosion, cyclonic disturbances, erosion-accretion, embankment design