

## Holocene brackish water invasion caused by sea level changes in the central part of Bengal Lowland

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This paper deals with brackish water invasion and paleogeomorphology, created by coastal processes i.e. sea level changes (transgression/regression), during the Holocene in the central part of the Bengal Lowland. The Bengal Lowland, faces the Bay of Bengal, located at the lowermost reaches of the three mighty Ganges-Brahmaputra-Jamuna Rivers, have been controlled by the late Quaternary environmental changes such as sea level change, climate change and so on. To reconstruct the paleoenvironment in the central part of the Bengal Lowland, three outcrops named Sony, Vatpara and Nayanipara were selected. Besides lithofacies analysis, pollen analysis and radiocarbon dating were performed.

Four phases were observed in identifying the salt water intrusion as well as mangal evolution around the study area. In the first phase the present study shows that the site Sony, at an altitude of 1.9 m above the mean sea level, was submerged by salt water due to a transgression of the Bay of Bengal around 7570-7430 cal BP. During this mid Holocene sea level high stand, a sand flat sequence was deposited at Sony and mangrove forests did not maintain their habitat due to the submergence of the area. A subsequent mud flat was developed in this transgressive condition near the high water/tide line in an intertidal coastal plain. Sand flat sequence shows abundant mangrove pollens seemed that mangrove vegetation was developed very close to the succession site. During this time the shoreline of the bay moved towards inland and salt water mixed with fresh water by tidal action and, as a result, an estuarine brackish environment was created around the study area and the terrestrial vegetation was replaced by a mangal ecosystem. In the second phase a small regression of the bay has been observed between around 7500-6500 cal BP. Due to this regression, the environment of the site Sony was changed gradually from a mud flat to a salt marsh. The salt marsh contains abundant mangrove pollens and marine and brackish water diatoms. These evidences provide support for inflow of shallow marine water in this brackish environment and, consequently, the mangrove forests took their positions very easily. In the third phase a trasgressive episode around 5580-5300 cal BP was observed from a mangal peat at altitude +0.4 meter at Vatpara. Due to this transgression the salt marsh at Sony moved back and mangrove forests kept their positions at the elevated site Vatpara. In the fourth phase the pollen results show several fresh water peat sequences, such as around 4080-4040 cal BP at 0.90 meter above m.s.l at Sony, 3690-3440 cal BP at 0.20 meter below m.s.l. at Nayanipara and 1820-1530 cal BP at 1.80 meters above m.s.l. at Sony. The study also shows that during the regressive episode of the bay before 4080-4040 cal BP the site Noyanipara was experienced with erosive activities and created some pools and depressions due to strong hydrodynamic condition of the river system. With the fall of sea level, erosional activities ended and filled up by the Holocene fresh water deposits.