PHYSIOGRAPHY AND CLIMATE

The geographical location of the present investigation lies in the Hooghly-Mahla estuarine complex, embracing the western sector of famous deltaic Sundarbans nearly 100 km. south of Calcutta between the latitudes 21°30’N to 21°55’N and meridians 88°02’E to 88°16’E (Fig-1). This estuarine complex of the tropics occupies an important place in the world map and can be categorised as a river delta estuary (formed at the mouth of large rivers) which has been advocated by Oдум (1977) in addition to Pritchard’s (1967) four categories of estuarine complex. This estuary is a positive estuary of mixohaline type. It has an approximately funnel-shaped wide mouth spread over an area of 20 km. stretch and probably due to the strong scouring action of the stream as well as tidal currents, a greater overall circulation is maintained. The tidal influence is felt in the upper reach of the river up to a distance of 250 km. from the sea face. The estuary experiences vertical turbulence to a high degree and is reported to have no appreciable stratification of temperature and salinity practically throughout its entire length (Bose, 1956). The deltaic system covers several islands of which Sagar Island, the largest of all situated on the western sector of Sundarbans, was selected for the present thesis work.

Sagar Island is surrounded by large bodies of water, the river
Hooghly in the north and north-western side and the river Mooriganga in the eastern side. The southern part of the island faces the open sea, Bay of Bengal.

Sagar island, about 235 sq.km. in area and partially reclaimed, is crossed by twelve large and small tidal creeks strewn with mangrove vegetation, all connected with the principal estuarine water either on the east or on the west coast. In the present study, six intertidal flats, three from each of the two major creeks namely, Sagar creek and Mooriganga creek, 25 km. apart, the former on the extreme south and later on extreme north of the Sagar Island, had been selected.

Sagar creek originates from and ends in Bay of Bengal traversing through the extreme supra-littoral zone of the southern part of this delta, the intertidal flats of this creeks are supported by luxuriant but rapidly diminishing mangrove patch comprising of Phoenix, Avicennia, Acanthus, Excoecaria, Ceriops, Derris, Ipomea, Salicornia, Suaeda, etc.

Three stations have been selected from the intertidal belts of the Sagar creek.

Station I is located at the eastern end of the Sagar creek. It is supported by a number of mangrove plant species, viz., Excoecaria galichia, Salicornia sp., Suaeda maritima, Ipomea sp.,
Avicennia officinalis, A. alba, A. marina, Bruguiera gymnorrhiza, Ceriops decandra, Derris heterophylla, Acanthus ilicifolius, Phoenix paludosa, etc., of which tree plants are under stress conditions.

Station—1, located in the middle of Sagar creek is with luxuriant me--rove trees and shrubby mangrove associates.

Station—11 is located at the western end of the Sagar creek, and is entirely covered with Phoenix plants along with some stressed Excoecaria, Sueda and Salicornia.

Station—17 is located at the beginning of the Mooriganga creek. It is covered with dense mangrove vegetations comprising of Excoecaria, Ceriops, Bruguiera, Sueda and Salicornia.

Station—1. located at the middle of the Mooriganga creek, is with rapidly e--ising mangrove patch. This station is now under tremendous e-th--ogenetic stress.

Station—1' located at the end part of Mooriganga creek is girdled with some large mangrove trees, mainly Excoecaria. It is also under anthropogenic stress.

The seso’s are well recognised, each with four months duration. The premonsoon period (March to June) is the dry season
with considerably higher temperature. The south-west monsoon season (June to October) is accompanied by heavy rainfall and the post-monsoon season (November to February) with comparatively lower temperature and less precipitation.

TIDES:

With the change of seasons, tidal interactions in the Hooghly estuarine system also change. Three distinct variations have been observed in the estuary so far as tidal regime is concerned (Pillay, 1958). During rains, from July to October, considering the effects of the monsoon, the flow tides are more or less completely nullified by the freshets and there is a strong predominance of the ebbtides. From November to February, is the second tidal rhythm owing to the banking of fresh-water in the river during the monsoons, the strength of the flood tide over the ebbtide is minimum. On the other hand, during the third tidal rhythm (March to June) the flood tide effects are considerably accentuated over the ebbtide. This brings about a pronounced change in salinity gradient in the estuary.

WIND:

The prevailing wind is from north and north-east from the beginning of October to the middle of March. The months of January
and February are relatively calm. It again commences to blow violently from south-west about the middle of March and subsides about September. Storms are common during spring and autumn. Some of these often develop into cyclones of varying intensity usually accompanied by tidal waves and cause much loss of life and damage to property and forests.