

Sediment and carbon accumulation in sub-tropical salt marsh and mangrove habitats of north-eastern coast of Bay of Bengal, Indian Ocean

ABSTRACT

Researches on salt marsh mangrove habitats as global carbon sink are increasing worldwide. However, uncertainties in measuring carbon sequestration capacity of the vulnerable subtropical South Asian coastal habitat thus obstructing the mapping sediment and carbon accumulation rate of their importance. The present investigation was carried out to assess the sedimentation and carbon accumulation rate in salt marsh and mangrove habitats in the vicinity of Sitakunda coast, Chittagong, Bangladesh. The data indicate that sedimentation rate was 22.76 ± 2.56 mg/cm²/day in mangrove area, 63.52 ± 7.42 mg/cm²/day in lower mangrove area, 97.02 ± 6.64 mg/cm²/day in higher marsh area, 5.91 ± 1.16 mg/cm²/day in lower marsh area and 9.81 ± 0.03 mg/cm²/day in muddy area. The average sedimentation rate was found 39.82 ± 6.72 mg/cm²/day during the study period. Soil organic matter in the newly deposited sediment was $3.89 \pm 1.28\%$, while $3.57 \pm 0.77\%$ in accumulated peat sediment. Organic carbon of the newly deposited sediment was $2.05 \pm 0.93\%$ and $1.89 \pm 0.55\%$ in accumulated peat sediment. Usually, the organic materials were found higher in the peat soil in the wetland habitat, while lower amount of organic materials are found in the present peat soil. Lower amount of organic materials in peat soil in the study area could probably due to higher utilization of organic materials by aquatic plants. Further, uncertainties remain about sediment and carbon accumulation changes with tidal range, latitude and elevation in study area require long-term spatio-temporal investigation.

Keyword: Salt marsh; Mangroves; Sedimentation; Soil organic carbon; Wetland