Can mangroves help combat sea level rise through sediment accretion and accumulation?

ABSTRACT

Mangroves have substantial roles to induce sedimentation in the vulnerable coastal regions, which subsequently helps to combat climate change induced impacts like sea level rise. Although Sarawak has numerous pristine estuarine mangroves, studies on the roles of these mangroves in regards to sediment deposition are scanty. Therefore, this study was carried out to determine the sediment accretion and accumulation pattern of pristine Sibuti mangrove using tiles and sediment traps from January to December 2013. Monthly average accretion and accumulation rate of sediments of this mangrove were 0.55 mm and 0.08 g cm-2, respectively. A total of 6.56 mm and 0.93 g cm-2 sediments were accreted and accumulated annually. Significantly positive correlation (r=0.794) was found for the monthly accretion of sediments with accumulation. Accretion and accumulation of sediments were also positively correlated with rainfall. Comparatively higher rate of accretion and accumulation of sediments were estimated in the months of wet season when the rainfall and tidal inundation duration were high. Erosion was found higher in the months of dry season when the rainfall was low. Seasonal variations were not found for sediment accretion as well as accumulation in the study area. The findings of the study suggest that the roles of this forest in regards to sediment accretion through retention is compatible with the predicted annual rate of sea level rise of 1.8 to 5.9 mm within 21st century by IPCC.

Keyword: Sediment accretion; Sediment accumulation; Sea level rise; Sibuti mangrove; Sarawak