ABSTRACT

The estuary area is highly productive due to the continuous supply of organic materials from the land through river flow and surrounding waters. The mixing of fresh water and seawater in this zone leads to changes in the physical oceanographic conditions. Sedimentation is the process of depositing materials derived from rocks transported by water and wind movements, and continuous sedimentation can cause shallowing in coastal waters. This study was conducted in Kuala Lancok, Syamtalira Bayu, North Aceh Regency, an essential area serving as a navigation route for fisherman. The aim of this research is to analyze the sedimentation rate, including its characteristics and oceanographic parameters that influence sedimentation processes. The method used was a survey method with purposive sampling at four observation stations. Data collected included primary data such as sedimentation rate, current velocity, and sediment fractions, as well as secondary data from the Nautide application and literature sources. The results showed that the sedimentation rate ranged from 822,43 to 2.006,61 mg/cm^2/day, with the highest rate observed at station 4. Sediment characteristics were dominated by fine sand fractions (up to 64,9%). The average current velocity ranged from 0,23 to 0,34 m/s, with the highest tide reaching 139 cm. These findings indicate that oceanographic dynamics such as current, tides,and water depth significantly affect sediment deposition processes. This study provides valuable insights into sedimentation patterns in Kuala Lancok and emphasizes the importance of integrating oceanographic factors into sustainable coastal management stategies.

Keywords: current, estuary, sedimentation, sediment characteristics, tidal