

ABSTRACT

This research investigates seawater quality and the pollution index based on oceanographic parameters at the Ujong Blang Fish Landing Base (PPI), Lhokseumawe City. The study employed a survey method with purposive sampling at three observation stations representing fish farming, port operations, and coastal tourism areas. The measured parameters included temperature, brightness, salinity, pH, dissolved oxygen (DO), nitrate, phosphate, and biochemical oxygen demand (BOD). Data were analyzed descriptively, and the Pollution Index (PI) was calculated according to Government Regulation No. 22 of 2021. The findings reveal that seawater quality in the study area shows variations across stations. Temperature (29.0–29.6°C), DO (5.5–6.6 mg/L), and pH (7.58–8.1) are within the acceptable limits for marine biota. However, brightness values (0.88–1.53 m) did not meet the standard, while nitrate (2.07–2.2 mg/L) and phosphate (1.91–9.03 mg/L) concentrations significantly exceeded permissible thresholds, indicating a high risk of eutrophication. Salinity ranged from 20.66‰ to 35.66‰, with deviations at some stations caused by freshwater inflows and limited water circulation. In contrast, BOD values (1.40–2.23 mg/L) remained well below the threshold, suggesting low organic pollution. The Pollution Index results categorize all three stations as moderately polluted ($5 < PI_j \leq 10$), mainly influenced by port activities, domestic waste disposal, fish cage operations, and riverine inputs. These findings highlight the vulnerability of coastal waters at PPI Ujong Blang to anthropogenic pressures. The study emphasizes the need for integrated environmental management, including stricter waste control, continuous water quality monitoring, and community awareness programs to maintain ecological sustainability while supporting local economic activities.

Keywords: Eutrophication, Oceanographic parameters, Pollution index, Seawater quality, Ujong Blang Fish Landing Base (PPI).