WATER QUALITY AND ITS SUITABILITY FOR RECREATIONAL ACTIVITIES ON BEACHES ALONG THE EAST COAST OF SRI LANKA

Nawas M. F.

Department of Chemical Sciences, Faculty of Applied Sciences, South Eastern University of Sri Lanka, Sammanthurai, Sri Lanka mfnawas@seu.ac.lk

Water and its recreational use significantly impact human health and well-being. In many coastal areas, tourism and recreation are vital economic sectors. Sri Lanka with its numerous scenic beaches, attracts thousands of local and foreign tourists annually. However, many of these beaches are facing serious declines in coastal water quality due to rising human population, rapid urbanisation, industrial activities and intensive agricultural practices. Assessing recreational water quality is essential for ensuring user safety and conserving the coastal habitats, hence sustaining the Sri Lankan tourism industry. This study investigates recreational water quality issues at three key beach destinations - Nilaveli in Trincomalee, Pasikkudah in Batticaloa and Arugam Bay in Ampara - on the east coast of Sri Lanka. The study was carried out with the objective to assess the marine water quality parameters at these three beaches to ensure that they meet health and safety standards for recreational users. It was done at different spells of various periods, ranging from 03 months to one year, since 2009 to date. Temperature, pH, Electrical Conductivity (EC), Salinity, Total Dissolved Solids (TDS), and Dissolved Oxygen (DO) were measured by using multi meter (Orion Star A329 portable pH/ISE/Conductivity/DO meter) and turbidity was measured by using turbidity meter (Hatch 2100Q Portable Turbidimeter). Nitrate and phosphate concentration were measured by using spectrophotometer (HACH, DR2000). Fecal coliform was enumerated by MF method. The results indicated that the mean values of measured parameters; water temperature, 28.63 ± 1.73 °C (≤ 2 °C, ambient temp.) pH, 7.85 ± 0.27 and DO, 7.44 ± 0.56 mg/L (4 mg/L). These parameters satisfy the marine recreational standards' threshold limits (of ASEAN MWQC). Salinity (31.30±4.01 PSU) and electrical conductivity (EC) (52.77±5.71 mS/cm) too were measured, both of which were uniformly consistent spatially and temporarily across all three beaches. TDS (50.44±8.61 g/L), turbidity (41.09±52.63 NTU), and faecal coliform (78.58±125.19 MPN/100 mL⁻¹) were fluctuating between dry and wet seasons, as well as across the three beaches. While nitrate concentrations $(0.65\pm0.88 \text{ mg/L})$ were within the recommended safe values, phosphate $(2.17\pm2.83 \text{ mg/L})$ levels were found to be exceeding the threshold limits for marine recreational waters, indicating that the beach has been contaminated with phosphate-containing sources. Based on the overall results of the beach water quality, it can be deemed that all three east coast beaches – Nilaveli, Pasikkuda and Arugam bay - are suitable for bathing and recreational activities.

Keywords: Fecal pollution, International standards, Marine water quality, Rainy season, Safety issues.