Status of water quality based on the physico-chemical assessment on river water at wildlife sanctuary Sibuti mangrove forest, Miri Sarawak.

Abstract

Problem statement: Mangrove forest is a component of wetlands that has been recognized as one of the most productive ecosystem in the tropic. Rapid development and other land uses in the mangrove areas over the years had negatively affected the ecological functions and its ecosystem. Study was carried out on river water quality at Sibuti Wildlife Sanctuary, Miri based on the physicochemical properties. Approach: A total of 72 water samples were collected from 12 stations or sampling points from Sungai Sibuti (SS) and its tributary, a man-made canal called Sungai Parit Scheme (SPS) at Sibuti Wildlife Sanctuary Miri, Sarawak in the month of June, August and October 2010. In situ data measurement such as temperature, conductivity, Dissolved Oxygen (DO), pH and turbidity were taken and labeled. Analysis for parameter such as ammoniacal nitrogen (NH₃-N), Biological Oxygen Demand (BOD), Chemical Oxygen Demand (COD) and total suspended solids (TSS) were conducted in the laboratory. Both in situ and ex situ data were measured and analyzed according to the Standards Methods APHA, 2005. Results for each water quality parameters are summarized as follows, temperature range (29.3-32.8°C), pH range (6.02-8.07), DO range (2.76-4.7 mg L⁻¹), conductivity (0.805-96.1 μS cm⁻¹), TSS range (0.00119-0.4361 mg L⁻¹), turbidity (10.2-15.3 NTU), BOD range (5.21-6.66 mg L⁻¹), COD (7.5-25) and ammoniacal nitrogen (0.1-0.31 mg L⁻¹). Results: Based on Water Quality Index (WQI) and Interim National Water Quality Standards for Malaysia (INWQS) by the Department of Environment Malaysia, river water of SPS and SS fall under Class II. Conclusion: The water quality status of river water at Sibuti Wildlife Sanctuary Mangrove Forest, Miri Sarawak is under category class II or good water quality status. All water quality parameters in this study are found to be in class I and II (good water quality) except for the BOD and DO which indicate fairer and moderate river water quality status.

Keyword: Biological oxygen demand; Chemical oxygen demand; Mangrove forest; Parit skim river; Sarawak forestry corporation; Sibuti river; Total suspended solids; Water Quality Index (WQI); Water quality parameter; Water quality parameters.