

Assessment of Canal-Borne Pollution and Water Quality Degradation in Mihintale Tank.

Jayawickrama GGH¹, Piyasena C²

¹*Department of Environmental Management, Faculty of Social Science and Humanities, Rajarata University of Sri Lanka*

²*Faculty of Humanities and Social Science, Open University of Sri Lanka*

Background: The Mihintale Tank, located in Sri Lanka's Dry Zone, is an agriculturally and environmentally significant reservoir that is currently experiencing severe water quality degradation due to the discharge of untreated effluents and solid waste. Four major waste input canals—originating from the southeast (town area), southwest (university hostels), west, and north (both from the university's main campus)—directly discharge into the tank.

Objective: This study aimed to evaluate water and soil quality at the points where these canals enter the reservoir, to inform appropriate environmental management interventions.

Methods: Water and soil samples were collected from each of the four inlet sites. Water samples were analysed for pH, biochemical oxygen demand (BOD), chemical oxygen demand (COD), electrical conductivity (EC), and dissolved oxygen (DO), while soil samples were assessed for pH, EC, organic matter content, and phosphorus concentration. The results were compared against the World Health Organisation (2022) guidelines for drinking-water quality and the UNEP/FAO wastewater guideline (1992) standards for agricultural water and soil use.

Results: The southwest canal-receiving effluent from the university hostels, exhibited significantly elevated values: BOD (350 mg/L), COD (750 mg/L), and EC (525 μ S/cm), all exceeding WHO and FAO thresholds (BOD: 110–350 mg/L; COD: 80–260 mg/L; EC: 400 μ S/cm). Soil quality at all sampling points remained within acceptable limits for agricultural use. These findings identify the southwest canal as the principal source of pollution affecting Mihintale Tank, likely due to the discharge of untreated wastewater from the university hostel complex. Water quality parameters from three of the four canals were within the WHO-recommended limits.

Conclusion: Immediate measures are recommended to treat wastewater at its source before discharge, to prevent further ecological degradation of this critical freshwater resource.

Keywords: Mihintale Tank, water pollution, BOD, untreated wastewater, environmental management.