Preliminary study on assessment of physicochemical characteristics of water in Deduru Oya Basin

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Deduru Oya originates in the central hills of Sri Lanka and flows most of its length through the North Western Province, which is affected by flash floods for a short period and with low flow of water for a long period. This study assessed the physicochemical characteristics of surface water of the river. Twenty-five locations were chosen from the upper, middle and lower catchments representing the wider area of North Western Province. The sampling locations were selected based on wastewater and sewage disposal points, irrigation channels, and shrimp farm outlets to collect samples during the Dry (D) and Wet seasons (W) in 2021. in-situ parameters (water temperature, turbidity, Dissolved Oxygen (DO), pH, Electrical Conductivity (EC) and Total Dissolved Solids (TDS)) and Nitrite, Nitrate, Ammoniacal nitrogen, Orthophosphate, Chemical Oxygen Demand (COD) and heavy metals (Mercury, Arsenic, Lead and Cadmium) were analysed following standard methods. Results revealed that mean pH (D:7.7±0.2; W:7.5±0.2), DO (D:5.9±1.4; W:6.2±0.7) mg/L, BOD (D:3.4±2.2; W:1.9±0.9) mg/L, Nitrite (D:0.017±0.05; W:0.024±0.06) mg/L, Nitrate (D:0.034±0.06; W:0.04±0.06) mg/L, Ammonia (D:0.134±0.106; W:0.15±0.14) mg/L, Orthophosphate (D:0.050±0.11; W:0.059±0.11) mg/L, TDS (D:170.7±102.7; W:139±101.5) mg/L, EC (D:287.8±180.8; W:233±165) µS/cm and heavy metals were found within the acceptable limits of ambient water quality standards stipulated by relevant authorities (Central Environment Authority, 2019). Lead (Pb) was found only in the samples collected from the Kurunegala area in both seasons (D:3; W:4 µg/L). Whereas arsenic (As) was recorded in Nikaweratiya (D:3 ; W:1 µg/L) and Chilaw (D:2; W:1 µg/L). The mean COD levels in all sampling locations were above the standard limits and varied from D:232±107.7 to W:179.7±113.9 mg/L. Domestic, agricultural and industrial discharges to the adjacent water resources could be the main reason for higher COD levels. Thus, results of this study can be used as a baseline data and further studies are recommended to identify the variations of physicochemical characteristics of water quality in the river basin.

Keywords: Deduru oya basin, physicochemical characteristics, water quality

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