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Spatial Distribution of Water Quality Parameters in Malala Lagoon of Bundala National Park, Sri Lanka**Madushani K.P.K.^{1*}, Amarasinghe M.D.¹, Ratnayake R.M.C.S.¹, Dahanayaka D.D.G.L.²**¹*University of Kelaniya, Dalugama, Sri Lanka*²*Open University, Nawala, Sri Lanka***madushani_2017@kln.ac.lk***Abstract**

Malala Lagoon of Bundala national park is one of the major wetland ecosystems on the southern coast that supports migratory and residential avifauna. However, the physicochemical characteristics of this lagoon have largely been influenced recently due to upstream irrigation works, especially, Lunugamvehera irrigation scheme, the drainage water of which is partly released into. The presence of invasive plants in these wetlands/lagoons is commonly attributed to the ecological changes that possibly have resulted from altered water salinity caused by increased freshwater input into these wetlands. This study was conducted to investigate the current status and spatial variation of water quality in the Malala lagoon. Water samples were randomly collected from fifteen locations from three strata, i.e. Malala North (MN), Middle (MM), and South (MS). Water samples collected for 2 years, representing wet and dry seasons were analysed for nitrate-nitrogen (NO₃-N), ammonium nitrogen (NH₄-N), total nitrogen (TN), orthophosphate (PO₄-P) total phosphate (TP), pH, salinity and electrical conductivity (EC). These parameters were interpolated using ArcMap 10.2.2 software to determine the spatial distribution patterns. Results revealed that concentrations of NO₃-N, NH₄-N, TN, PO₄-P, TP forms, and EC, pH, the water level of the entire lagoon were ranged as 303.0-510.8 µg L⁻¹, 202.7 -452.8 µg L⁻¹, 500.1-2200.1 µg L⁻¹, 4.1-27.4 µg L⁻¹, 11.1-52.3 µg L⁻¹, 598.0-1973.0 µS cm⁻¹, 7.05-8.14 and 63.0-217.0 m respectively. The highest concentration of all species of nitrogen and phosphorous were observed from the northern part of Malala lagoon (MN), this is the area that receives the drained irrigation water or agricultural runoff. These higher concentrations gradually decrease towards the Southern part of the lagoon which is closer to the outlet. Lower EC and salinity in the Northern section of the lagoon is also due to the dilution with the excessive freshwater that enters the lagoon. The present study provides an insight into the spatial variation of the quality of water that manifests the anthropogenic impact on lagoon ecology.

Keywords: Wetland ecology, Water quality, Malala Lagoon, Impact of agricultural drainage