

Influence of land use on aquatic pollution in an urban wetland: a case study in ‘Kiralakale’, Matara District, Sri Lanka

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Kiralakale is an urban wetland in southern Sri Lanka. This study examined the aquatic pollution status within the wetland in relation to the nearby land-use composition. Eight water sampling sites considering inlets and outlets, low flow rate, and easy access were selected to represent the whole wetland. Percentages of different land-use types (urban, forest, marshlands, paddy lands, sparse vegetation, and water bodies) within a 300m buffer area around each site were assessed via remote sensing and GIS. Temperature, Electrical conductivity (EC), Total Dissolved solids, Salinity, Dissolved Oxygen, pH, Nitrate (NO_3^-), Orthophosphate (PO_4^{3-}), Heavy metals (Cu, Cd, Cr, Pb) in water and macro-benthos in sediment were analyzed at two sampling occasions with three replicates from each site. There were significant positive Spearman rank correlations between the proportion (%) of Urban and settlement land cover and NO_3^- ($r = 0.762$, $p < 0.01$), PO_4^{3-} ($r = 0.738$, $p < 0.01$), and EC ($r = 0.833$, $p < 0.01$). Similarly, Paddy land cover and NO_3^- ($r = 0.994$, $p < 0.05$), and PO_4^{3-} ($r = 0.994$, $p < 0.05$) were positively correlated. Negative correlations were observed between forest cover and NO_3^- ($r = -0.708$, $p < 0.01$), and sparsely distributed vegetation and NO_3^- ($r = -0.881$, $p < 0.05$), and PO_4^{3-} ($r = -0.905$, $p < 0.05$). Cu and Cd concentrations (0.006-0.022 ppm) were below the accepted limits (0.05 ppm and 0.03 ppm, respectively) in Sri Lanka. The absence of pollution-sensitive EPT taxa and the presence of pollution-tolerant *Glycera* sp., *Pomacea* sp. *Helisoma* sp. etc. in sediment indicated moderate pollution at sites. Results showed urban setup has affected aquatic pollution levels in Kiralakale wetland.

Keywords: Kiralakale wetland, Land use Change, Water quality, Wetland pollution

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