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## **Spatio-temporal variation of surface water quality in Kalu Oya and Mudun Ela micro-catchments during rainy season**

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Kalu Oya and Mudun Ela basins are micro-catchments of the Kelani river basin mostly consisting of low-lying urbanized areas. Sri Lanka Land Reclamation and Development Corporation (SLLRDC) requires surface water quality assessment of these micro-catchments in order to prepare a wetland management strategy for the catchment. This study was aimed at assessing the surface water quality at the catchment as a preliminary study. As per the collected data on land use, catchment hydrology and wetland distribution, sampling sites were selected based on random and judgmental sampling techniques. Sampling was carried out from June to October 2018 in South-Western monsoon period. Sampling frequency was once a month. Spatially composite water samples were triplicated from each sampling point. Water samples were preserved and stored in 4°C and were transported to the laboratory and analyzed using standard methods for ex-situ water quality parameters namely; Biochemical Oxygen Demand (BOD<sub>5</sub>), Chemical Oxygen Demand (COD), Oil and grease, Nitrate and dissolved Phosphorous levels. In-situ physico-chemical parameters namely; water temperature, pH, salinity, conductivity, Total Dissolved Solids (TDS) were measured using instruments on-site using standard calibrated instruments. The mean values of data gathered from physico-chemical analysis in each sampling site at each sampling event were compared with the Proposed SLSI (general) surface water quality standards. Nitrate levels in all the sites were below the standard. Site 02 which is situated at the fish market outlet exceeded the standard levels of conductivity, TDS, salinity, phosphate, COD and BOD<sub>5</sub> levels. Oil and grease levels in all the sites were extremely higher than the standard limits. This may be due to service stations located at the upper catchment of the area might be discharging oil and grease contaminated water to the surface area. Physico-chemical data were subjected to analysis of variance using two-way ANOVA. When the null hypothesis in the ANOVA was rejected, Tukey's pairwise comparisons were carried out. All the water quality parameters were significantly different among ten sampling points ( $p < 0.05$ ) and showed spatial variation. Temperature, pH, conductivity, TDS, salinity, DO and COD levels were highly independent among sites. BOD<sub>5</sub>, oil and grease and phosphate levels showed grouping (95% confidence Interval) in the study area. All the water quality parameters were significantly different among the five months. It is recommended to repeat this study in the dry season for better conclusion.

**Keywords:** Oil and grease, Surface water quality, Analysis of variance, Kalu Oya, Mudun Ela