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## **SPATIAL AND TEMPORAL DISTRIBUTION OF WATER QUALITY PARAMETERS OF SURFACE WATER IN THE KELANI RIVER BASIN USING GIS**

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### **ABSTRACT**

Water pollution is considered as the presence of excessive amounts of pollutants in water in such a way that it is no longer suitable for drinking, bathing, cooking or other uses. Thus, sustainable development of a country depends on the quantity and quality of the water. The demand for water in Sri Lanka is gradually increasing trend for domestic consumption and production. Contribute surface water pollution causing changes of physico-chemical and biological parameters of water. Kelani river is one of the major river in Sri Lanka and provides about 80% of the drinking water supply to the capital city of Colombo. The present paper describes the application of GIS for spatial distribution of some important water quality parameters of the surface water in the Kelani river basin. 45 surface water sampling locations were selected for the study and physico-chemical and microbial contamination was recorded using the standard methods. Conductivity values of surface water was high during the dry period than the wet period. Later part of the meandering region showed high conductivity ranged from 10000 to 40000  $\mu\text{S}/\text{cm}$ . High BOD was recorded at head and meandering regions ( $> 5.0 \text{ mg/l}$ ) during the southwest monsoon period ( $<0.50\text{-}23.94 \text{ mg/l}$ ) where as high COD was recorded ( $> 100.0 \text{ mg/l}$ ) during the southwest monsoon period ( $1.33\text{-}402.90 \text{ mg/l}$ ). High hardness was recorded from the lower part of the meandering region ( $>100.0 \text{ mg/l}$ ). High nitrite concentrations recorded in meandering region of the river basin ( $>5.0 \mu\text{g/l}$ ) with highest values ( $>10.0 \mu\text{g/l}$ ) during the southwest monsoon period ( $<1.00 - 24.06 \mu\text{g/l}$ ). Nitrate concentration was high during the southwest monsoon from both head and meandering region of the river basin ( $>2.0 \text{ mg/l}$ ). pH range from 7.0 to 7.5 was recorded in head and meandering part of the river basin. Total coliform and Faecal coliform contamination were high during the southwest monsoon and the later part of the meandering region showed contamination greater than  $1100 < \text{MPN}/100\text{ml}$ . GIS spatial distribution maps give better graphical summary to understand the spatial and temporal distribution pattern to overlook better conclusion. The finding of the study concluded that surface water quality of river basin is in deteriorating trend towards to the meandering zone of the river basin and proper strategic management plan with awareness about catchment protection is needed to safeguard surface water of the Kelani river basin for human consumption.

**Keywords:** Kelani river basin, Surface water, Physico-chemical and microbial parameters, Spatial distribution maps