

**Title:** Spatial Variation of Water Quality in Jaffna Lagoon

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**Abstract:** Jaffna Lagoon is a productive fishing ground and also a sink for many anthropogenic effluents draining from its surrounding urban area. Jaffna lagoon suffers due to the consequence of urban growth and land use from the surroundings and end up with diminishing water quality. Hence the objective of the study was to analyze the spatial variation of water quality characteristics and identifying the extent of the pollution in the Jaffna lagoon of Sri Lanka to implement appropriate pollution prevention schemes to sustain the productivity and bio diversity of the lagoon. Twenty Sampling points were selected systematically and the distance between two sample points was around 500 m and covering the total length of 100 km. Water sample was collected from 10 cm below the water surface during heavy rainfall in December 2019. Physico chemical parameters; pH, Electrical Conductivity (EC), Total Dissolved Solids (TDS), Salinity, Total Suspended Solids (TSS), Dissolved Oxygen (DO), Turbidity, Biological Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Nitrate, Phosphate and oil and grease were measured by standard methods. The study revealed that the water pH of the lagoon varied between 7.8 - 8.3; EC 4.2 - 6.8 dS/m; TDS 1.45-4.75 ppt; Salinity 2.88 - 10.56 ppt; DO 3.9-6.5 mg/l; TSS 1.2-3.2 ppt; Turbidity 11.2-16.4 NTU; BOD 7.8- 19.5 mg/l; COD 12.5-39.5 mg/l; Nitrate 2.03-3.01 mg/l; and Phosphate 0.15-0.45 mg/l and oil and grease less than one. High value of total dissolved solids, total suspended solids were the major problem in all locations. Higher number of solids come from the seasonal flooding. Phosphate and dissolved oxygen were also problem in certain locations. Water sample near to the Holy cross health center significantly varied from other locations since there is an outlet drainage channel from the city. The results are important in understanding the pattern of variation of water quality parameters so as to assist relevant agencies to plan, protect and aid in the management of the lagoon water for different uses.