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APPLICATION OF WATER QUALITY INDEX (CCME-WQI) IN ASSESSING WATER QUALITY FOR GROUND WATER IN KELANI RIVER BASIN, SRI LANKA

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Kelani river basin is one of the important river basins in Sri Lanka and contributes for agriculture and operation of several industries. Kelani river basin covers nearly seven districts and also cover Colombo city which is the commercial capital city of Sri Lanka. The river basin is subjected to the pollution by various sources such as land use practices (paddy, tea, rubber, coconut, vegetables and other export agricultural crops cultivation), industrial wastes and several other anthropological activities (urbanization, agriculture, sand mining, gem mining, domestic activities and several other constructions). These pollutants directly and indirectly affect the quality of groundwater and surface water as well. Majority of the human population in the river basin depend on the shallow groundwater for their daily needs. Thus water quality management of the river basin has become an urgent requirement to safeguard the human health. Water Quality Index (WQI) is a key to solve the problems of data management and to evaluate management strategies for improving water quality.

A WQI developed by the Canadian Council of Ministers of the Environment (CCME) provide a convenient mean of summarizing complex water quality data. The present study describes the application of WQI for groundwater in Kelani river basin to evaluate their suitability to use especially for drinking, livestock and irrigation purposes. Thirty (30) groundwater sampling locations in the Kelani river basin were selected for the WQI assessment and sampling was done from October 2012 to September 2013. CCME WQI was applied for eighteen water quality parameters: pH, Total Dissolved Solids (TDS), Dissolved Oxygen (DO), total phosphate, conductivity, Biological Oxygen Demand (BOD), Chemical Oxygen Demand (COD), nitrate, nitrite, hardness, total coliform and feacal coliform bacterial counts, Cr, Pb, Cu, Zn, Al and Cd. Based on the results, the index values and their ranks for drinking recorded as poor (33). Water quality for irrigation (80) and livestock (100) were recorded as good and excellent respectively. The results strongly suggested taking actions to develop proper management strategies to safeguard the river basin as the Kelani river serves for more than 80% of water supply for recipients living within the premises of the river basin.

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