

## Abstract

There is a significant need for a scientific approach to interpret water quality monitoring data and to facilitate the rapid transfer of information to water resources managers. The water quality index (WQI) is defined as a single numeric score that describes the surface water quality condition at a particular time and location. The objective of this study is to describe the WQI concept and approach for developing WQI for the Kelani River.

In this study 11 - parameter Scottish WQI was used to assess the monthly water quality of the Kelani River and tributaries during the six months period starting from February, 2007, scaled from zero (lowest) to 100% (highest). Altogether eight locations, four locations from the river and four locations from the tributaries were surveyed. From the surveyed parameters (temperature, pH, electrical conductivity, dissolved oxygen, biochemical oxygen demand, chemical oxygen demand, nitrate, phosphate, lead, chromium and cadmium) it was found that the water quality in the river decreased gradually down stream from good to fair. Depending on the location, different parameters were responsible for the episodic decline of water quality: high electrical conductivity, high chloride content, high chemical oxygen demand, and high trace metal content in the downstream and high chemical oxygen demand in the upstream. The water received by Ambatale water intake showed fair quality (WQI=78.33).

Furthermore, the study revealed that there were variations in physico-chemical concentrations during the dry months due to the sea water intrusion. Due to movement of salinity wedge to upstream high electrical conductivity high chloride content were observed during the months of February to April at Ambatale water intake, Victoria Bridge, and Hamilton Ela.

This study shows the need to enforce the regulations to mitigate the Kelani River pollution in order to improve the water quality received by the down stream.

Evaluation of physicochemical characteristic including heavy metals in aquatic ecosystem as a whole is of great importance for the assessment of pollution level. Based on the results, the distribution of trace metals indicated that the concentrations of these metals are derived from water with regular increase of pollution levels from residential and industrial areas. Due to the great importance of this water body for municipal water supply to Colombo Metropolitan Area, such studies are required to ensure that any changes are recognized quickly and appropriate step is taken to address any future problems.