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Analysis of Raw Water Quality of Water Supply Intakes of Maha Oya

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Abstract

Maha Oya is one of the main rivers in Sri Lanka, very much used for drinking water extraction. It flows through five important districts of Sri Lanka offering water through fourteen water supply intakes, eight of which are located along the main river while others are scattered along the tributaries. Only three of the associated plants offer conventional treatment for water. This river receives much organic waste from the upstream. Industrial discharges and harmful anthropogenic activities are common in the final stretch of the river.

This study aims to investigate the contamination of Maha Oya water around each intake points along the main river and to find causes. Samples were collected from water supply intakes during both high and low flow rate conditions. Analysis was done on pH, turbidity, DO, COD, BOD, phosphate, Nitrate, Sulfate, Chloride, Fluoride, Coliform and heavy metals which were selected based on the drinking water quality requirements of the country.

According to the results, Mawanella Intake records high BOD and Coliform counts due to the municipal and house hold discharges from the townships, overflow of Soakage pit and septic tanks of Mawanella town during rainy seasons. Waste load coming from three tributaries confluences was attributed to high values of BOD, COD and coliform count while cultivation in the vicinity has increased the nutrient at the Hirwadunna intake. COD value of the sampling location at the Allawwa intake is very high. As it is located in the Allawwa town, waste from the town is disposed to the river directly and concentration is very high during low flow conditions. Girulla intake is polluted mainly from bank erosion due to the anthropogenic activities like cay mining. COD and BOD values are comparatively high due to direct discharges. Pollution associated with Bamukuliya intake is due to the discharge of Makandura IP. The effect is reduced when it comes to the Bambukuliya intake even though it exceeds the COD for drinking water with simple treatment. Sea intrusion has not affected the Bambukuliya intake due to the salinity barrier at Bambukuliya. Heavy metal concentration of all intakes are below the respective standards.

Keywords: Water quality, Industrial discharge, Anthropogenic activities