
POLLUTION ASSESSMENT IN TRIBUTARY WATERS OF MAHAWELI RIVER AROUND KANDY CITY

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In most part of the world surface water satisfies majority of water requirements of human community. In this regard, rivers have been the most significant contributor of surface water among the limited water resources available. In most of the developing countries, frequently the river pollution can be mainly attributed to untreated waste discharges from commercial and industrial establishments. The danger is that in a situation where water pollution may be steadily increasing, unless an effort is made to build up records, and understanding of the processes and trends, the changeover from tolerable condition to intolerable conditions may come as a sudden event.

Among the rivers, "Mahaweli" is the largest river basin found in Sri Lanka estimated in draining 16 percent of Sri Lanka's land surface (10327 km²). In recent times with increase in population and urbanization, settling around townships especially on the banks of "Mahaweli" has shown a marked increase. Among these, Kandy the second largest city in Sri Lanka is believed to contribute most of pollution into the headwaters through a number of its tributaries around the city.

In this study, three major tributaries namely Pinga Oya, Nanu Oya and Maha Oya around Kandy area are selected for monitoring the water quality. Out of these tributaries, two flows through highly populated areas with concentrated dwellings and industrial establishments especially by the side of the river. In an initial survey, highly polluted zones were identified and sampling points were selected from head waters to the downstream based on the findings. At each cross section, samples were taken at various depths across the river twice a month from August 2000. According to the obtained data, temperatures were recorded in the range of 23°C and 31°C and pH almost in neutral conditions creating ideal condition for bacterial growth. The recorded DO concentration was in the range of 6.5-2mg/l in most occasions. Comparatively higher DO concentration was recorded at the upstream than the downstream. Conversely, due to large waste loads and stagnant water conditions, very low DO concentrations were observed at the downstream of Pinga Oya. Furthermore, depletion of DO values from the beginning to the end of the sampling indicates the deteriorating water environment of the Pinga Oya. Though the phosphate variation is not much significant, nitrate level has increased by three to four times during the sampling period. The low level of nutrients and the BOD₅ values (BOD₅ less than 5mg/l) indicates effects of good dilution and high assimilation. However, higher COD values recorded at some locations implying that the organic matter making up the COD may include substances that are slowly biodegradable that can be harmful to aquatic life. Further, the most alarming circumstance was the high levels of fecal coliform detected in all three tributaries throughout the study period (in the order of 500 to 7000 cfu/100ml). Hence, from the obtained results, especially low DO concentrations and high coliform counts show high pollution levels in the tributaries and indicate a possible limiting state of their assimilative capacity in some river stretches.