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**PHYSICAL, CHEMICAL AND BIOLOGICAL  
PARAMETERS OF WATER  
QUALITY AT SOME SELECTED SAND MINING  
LOCATIONS OF THE LOWER REACHES OF  
KALUGANGA**

By

**Mettha Srini Ranasinghe (B.Sc. Biological Science)**

Thesis submitted in partial fulfillment of the requirements for the degree of Master of  
Science (Forestry and Environmental Management)

Department of Forestry and Environmental Science

Faculty of Graduate Studies

University of Sri Jayewardenapura

Gangodawila

Nugegoda

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## ABSTRACT

Out of 103 rivers in Sri Lanka the 3<sup>rd</sup> largest major river is Kaluganga, which has the highest volume of discharge as a percent (%) of precipitation per year out of the Sri Lankan rivers. It originates 2243m above mean sea level (Sripada), is 118km in length and opens to the sea at Kalutara.

The lower reaches of Kaluganga is a densely populated zone where the inhabitants are highly dependent on sand mining activities, which adversely affect the quality of the water in the river.

In this study to assess the extent of mining effects, six sites were selected. Out of those sites, water samples were collected from one site for monitoring purposes, the location of the Kethhena water intake. In the other five sites heavy sand mining activities are going on. To compare the variation of chemical, physical & biological parameters in water, samples were collected from each site and analyzed weekly for two months.

The physical parameters measured include - temperature, turbidity, suspended solids and electrical conductivity. Chemical parameters assessed include pH, dissolved oxygen, BOD<sub>5</sub> (biochemical oxygen demand), alkalinity, water hardness, [Cl<sup>-</sup>] and COD (chemical oxygen demand).

The data were analyzed by T-Test of Mean using GLM procedure of MINITAB for comparison with inland water quality standards in Sri Lanka. The data were analyzed by TWO WAY ANOVA using GLM procedure of MINITAB. Followed ONE WAY ANOVA with Tukey's pair wise comparison. Microscopic and macroscopic identification of biological parameters were carried out.

According to the results obtained, the value of pH, temperature and dissolved oxygen were in the desirable level. But some values like conductivity, suspended solids, turbidity, alkalinity, [Cl<sup>-</sup>], [Fe], phosphates as P<sub>2</sub>O<sub>5</sub> were higher than the desired range. BOD<sub>5</sub> was low, which means low level of free organisms and organic matter in the river water because of habitat destruction by mining. [Cl<sup>-</sup>] along the river indicates that salt-water intrusion was directly effected by mining activities, lowering the riverbed. COD, DO, pH, Nitrogen, and water hardness were lower than the standards. *Anabena spp.*, *Nostoc spp.*, *Microcystis spp.*, *Closterium spp.*, *Cosmarium spp.*, *Occilatoria spp.*, *Spirogyra spp.*, *Spirulina Spps.* were found as biological indicators in the water at mining sites but was low in abundance. At the site of water intake, few species were identified but abundance was higher than in other sites. These include, *Occilatoria spp.*, *Closterium spp.*, and *Cosmarium spp.*, *Spirogira spp.*.

According to the above results it can be concluded that water quality at the selected sand mining locations of the lower reaches of Kaluganga are adversely affected and that sand mining activities may be a contributory factor.

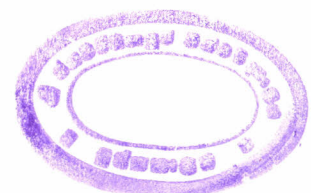


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