

SEASONAL VARIATION OF WATER QUALITY STATUS OF MENIK GANGA, KATARAGAMA, SRI LANKA

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The Menik Ganga which flows through the holy city of Kataragama is located in the southern semi-arid part of Sri Lanka. The catchment of the river (1,272 km²) receives its annual rainfall (1496 mm) mainly from northeast monsoons (from November to January) and the dry season lasts from June to September. The river supplies water for rice and sugarcane agriculture and also for domestic purposes. During the Kataragama festival season (July and August) over 0.1 million pilgrims utilize the river water per day, over a period of 15-days which can easily lead to epidemic conditions.

A comprehensive study was done for three consecutive years (2012 - 2014) to understand the seasonal variation of water quality status of Menik Ganga. Twenty crucial physico-chemical and microbiological parameters (pH, colour, TDS, sulphate, nitrate, nitrite, free ammonia, chloride, fluoride, total alkalinity, conductivity, hardness, iron, COD, DO, BOD, phosphate, turbidity, total coliform and faecal coliform) were measured monthly from year 2012 using standard techniques. The highest pH was recorded in 2013 (8.1 ± 0.31) and the lowest in 2012 (7.1 ± 0.12). The nitrate ($0.007 - 0.13 \text{ mg L}^{-1}$), sulphate ($8 - 39 \text{ mg L}^{-1}$), TDS ($203 - 560 \text{ mg L}^{-1}$), free ammonia ($0.01 - 0.3 \text{ mg L}^{-1}$), fluoride ($0.29 - 1.03 \text{ mg L}^{-1}$), hardness ($69 - 206 \text{ mg L}^{-1}$), COD ($3 - 37 \text{ mg L}^{-1}$), total coliform (240 - 22000) and faecal coliform (11 - 4600) varied during the study period. Principal Component Analysis (PCA) was done using the twenty environmental variables which were used to determine the water quality. The results of PCA clearly indicate that rainfall and Kataragama festival season help differentiate the monthly water quality of the river. PC1 score into one-way ANOVA test was also done to confirm the separation of water quality in different months and showed that there was a significant difference between January, April, October, November, December and other seven months.

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