

# ASSESSMENT OF SOURCE WATER QUALITY ALONG THE RIVER MA OYA AND ITS IMPACT ON OPTIMUM $Al^{3+}$ CONCENTRATION FOR DRINKING WATER TREATMENT

**D. Ilangangadara**

Postgraduate Institute of Science, University of Peradeniya, Peradeniya, Sri Lanka  
Regional Laboratory, National Water Supply and Drainage Board, Kegalle

The quality of surface water is a very important issue. The impressive growth of human population and economic development have resulted in the current worldwide deterioration in water quality. Water quality refers to the physical, chemical and microbiological characteristics of water. Water treatment or the purification and sanitation of water vary as to the source and kinds of water. This study aims to assess spatial and seasonal variations of water quality of Ma Oya by analyzing selected water quality parameters and assess the effects of these variations on the drinking water treatment processes.

Grab samples were collected from three water intake locations along the Ma Oya. Samples for pH and Turbidity were collected daily. Sampling for other parameters mentioned in SLS 614, 1986 Part II was done once a month in the same day for easy comparison. Pollution sources were identified with collaboration of the MOH (Medical Officer Health) of area and these sites were visited with relevant MOH or Public Health Inspector of the area and grab samples were taken for waste water analysis. Sample preservation and pretreatment was done as mentioned in standard methods for water and waste water analysis. The Jar test was conducted twice a day to determine optimum aluminium sulphate dosages.

Though the results of bacteriological analysis did not show any seasonal variation it showed a good spatial variation. Colour distribution pattern in Ma Oya exactly reflected the rainfall pattern. Turbidity results varied both seasonally and spatially. Electrical conductivity, pH, chloride, alkalinity and hardness also indicated a spatial variation. Nitrate, nitrite, free Ammonia, total phosphate, total iron and total sulphate levels were not up to the detectable level throughout the year of sample analysis. High turbidity of the collected samples indicate the heavy pollution load of Ma Oya due to road construction activities. Ma Oya is also contaminated due to waste water from hotels and households, timber waste and paint from timber shops & soaps and detergents from recreational use. A nemogram was developed using the results obtained from the Jar testing to select the optimum aluminium sulphate dosage at different Turbidity and pH levels.

Ma Oya is polluted from many sources but many water quality parameters are within the threshold levels, specified in SLS 722: 1985. The nemogram constructed from the Jar test data can predict the optimum aluminium sulphate dosage for flocculation at different Turbidity and pH levels.