CONTAMINATION OF STREAM WATER AND SEDIMENTS OF THE KANDY URBAN AREA

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W. M. D. Isurani Wanasooriya

Department of Geology

University of Peradeniya

Peradeniya

Sri Lanka

Abstract

Pollution of urban aquatic systems in Sri Lanka is a major problem, especially the contamination by nutrients and heavy metals. The urban canal system in the Kandy urban area is being used to discharge urban waste water and dump domestic garbage. Present study examined the urban input on the contamination of major canal system (Mid canal and Mahaiyawa canal) of the Kandy city. Selected samples of canal water was analyzed for pH, conductivity, salinity, temperature, nitrates, phosphates, heavy metals (Cu, Cr, Cd, Pb Zn, Fe, Mn) and the major cations (Na, K, Ca, Mg). The canal sediments were also analyzed for total phosphorus, heavy metals and major metals.

NO_3^- - N and PO_4^{-3} concentrations of analyzed water are significantly high, and their values vary from (3.8 to 7 ppm) and (0.17 to 0.61 ppm) respectively. The measured Cu (0.01 to 0.02 ppm), Pd (0.02 to 0.15 ppm), Zn (0.01 to 0.04 ppm) Fe (0.54 to1.36 ppm) and Mn (0.29 to 0.46 ppm) in canal water is low compared to the values measured 20 years ago by previous investigators. However, present study revealed that the Pb values are still high.

The average values of Cu, Cr, Cd, Pb, Zn, Fe and Mn in sediments are 32.5, 33, 1.3, 38.8, 112.5, 44250 and 49 ppm respectively. Cr, Zn and Fe concentrations are markedly high. Although the toxic metal concentrations are not very high in water and sediments, the measured values show the influence of the anthropogenic activities on the environment. The strong positive correlation of them with the total phosphorus of sediments indicates that they are bound to the phosphate compounds in sediments. Na, K, Ca and Mg in water and sediment were found in lower concentrations. While the water shows Mg> Ca> Na>K, sediments show K>Mg>Ca>Na.