RELATING CLIMATIC PARAMETERS WITH LEACHATE CHEMISTRY AND ITS ASSOCIATION WITH RIVER WATER QUALITY

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by

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Abstract

Increased solid waste generation due to rapid urbanization and industrialization is a major problem in the world (Golomeova et al. 2013).Landfilling is the most common disposal method of municipal solid waste (MSW) in developing countries, even though majority of these landfills are not properly managed, and pose a serious threat to the environment due to leachate run-off which contaminates the nearby ground water and surface water bodies (Kjeldsen 1993).

The solid waste dumping operation in the Kandy area is canyon method, where a suitable canyon (depression) has been filled with dumped waste (Werellegama & Samarakoon 2007) without taking any measures to prevent or minimize hazards arising from dumped waste. Hence this study was carried out concentrating on the impact of climatic parameters on leachate quality and its association with the river Mahaweli water quality which has not yet been further studied

Landfill leachate ,river water samples and ground water samples were collected from the leachate drain of the Gohagoda landfill, four locations along the Mahaweli river- two upstream and two downstream points from where leachate drain to the river and from two wells within the landfill. Weekly sampling was carried out for a period of two months and sample preservation, storage and analysis were performed according to Standard Methods (APHA, 1999). Daily temperature and rainfall data were collected from Horticultural Crop Research and Development Institute (HORDI) Gannoruwa and the statistical computations were performed with MINITAB version 17.0.

The concentration of Gohagoda landfill leachate components in the primary leachate were higher than CEA standard values and most of these parameters were similar to the past studies. According to the results obtained from the Pearson correlation Analysis and the ANOVA table, no significant impact on Mahaweli river water was caused by the Gohagoda leachate and this is most probably based on the dilution.Few of the leachate parameters were effected from the temperature and rainfall, yet a comprehensive study should be carried out encountering all other climatic parameters(wind pattern, solar radiation)in order to develop a broader view.