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OPEN SOLID WASTE DISPOSAL AND ITS EFFECTS ON WATER QUALITY IN CENTRAL PROVINCE AREA OF MAHAWELI RIVER DUE TO PREVAILING URBAN AREA MANAGEMENT SYSTEMS

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Open dumping is the most common method of solid waste disposal in Sri Lanka. Majority of the dumping sites are located on the river basins causing water pollution. The objective of the ongoing project is to identify the effects on water quality of Mahaweli River due to prevailing urban systems. The entire study area is located in the Central Province area of Mahaweli River representing Study Site 1 at Ginigathhena in Nuwara Eliya District, Study Site 2 and 3, respectively, at Peradeniya and Gohagoda in Kandy District, and Study Site 4 at Wariyapolawatta in Matale District. The two open dumping sites at Gohagoda in Kandy and Wariyapolawatta in Matale were selected, respectively, to identify the point and non-point sources of pollution, composition of wastes collected, the effects of pollution and to identify the associated stakeholder groups. Dissolved oxygen (DO), chemical oxygen demand (COD), Biological Oxygen Demand (BOD), nitrates, phosphates, pH, conductivity, total dissolved solids (TDS), total suspended solids (TSS) and turbidity of water samples collected were analyzed in the Analytical Research Laboratory, University of Peradeniya following the standard methods from November 2019 to February 2020. Study Site 4 showed a significant difference in pH from other sites, being more alkaline. TDS values of the current study varied between 89.7 mg L^{-1} and 246.3 mg L^{-1}. Highest conductivity and TDS values were associated with the open dumping site in Wariyapolawatta, Matale, which indicated the mixing of leachate with river waters, while the lowest at Ginigathhena, where pollution was minimal. Highest mean COD value was recorded as 115.7 mg L^{-1} in Study Site 4. The highest average nitrate concentration observed in Study Site 2 may be due to the grey and black water discharges from Meda-Ela. Study Sites 3 and 4 also had considerably higher average values of nitrates because of the gully discharges in Gohagoda and the household waste water in Wariyapolawatta area. Each of the selected study sites did not record phosphates. However, results indicate that changes in measured water quality parameters had occurred due to solid wastes, urban waste water discharges, etc.

Keywords: Central province, Mahaweli River, Open solid waste disposal, Urban area management, Water Quality