Contamination of Drinking Water by Solid Waste Leachate: A Case Study in Badulla Municipal Council, Uva Province, Sri Lanka

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The most common municipal solid waste disposal method in Sri Lanka is open dumping primarily due to the lack of financial assistance, operation technology, and maintenance facilities. The studied municipal solid waste dumpsite is located in the *Badulla* city, where *Badulu Oya* (River) flows surrounding the dump site. The pollution potentials of river water due to leachate from the *Badulla* dumpsite have not been studied. The main objective of this study was to assess the contamination of drinking water by solid waste leachate of the Badulla dumpsite. Water samples from river water (RW), tap water (TW) and groundwater (GW) were collected within a 300 m distance from the dumpsite during the period of May to August 2018 at monthly intervals with three replicates. In parallel to water samples, leachate samples (L) were also collected from the dumpsite. All water samples and leachate samples were analyzed for pH, electrical conductivity (EC), Turbidity, total dissolved solids (TDS) and some selected heavy metals of (Cd, Cr, Ni, Cu, and Fe). The measured water quality parameters were plotted and compared with the drinking water quality standards of WHO and SLS 614 guidelines. The results obtained from this study showed that the leachate generated from the municipal solid waste dumpsite had an impact on GW quality. According to this case study, parameters such as EC, Turbidity, TDS, Cr, Ni, and Fe have exceeded the SLS 614 water quality standards for GW and RW. On the other hand, TW did not show any contamination levels mainly due to the purification process by the National Water Supply and Drainage Board. Further studies are needed to evaluate the spatio-temporal variation of water quality parameters representing annual variation at different locations of the river and groundwater.

Keywords: Open dumping, Solid waste, Leachate, Water pollution