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Heavy metal contamination in the vicinity of a landfill site at Weligama, Sri Lanka

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Environmental pollution due to landfill leachate has given rise to a number of studies in recent years. Heavy metals are a source of environmental pollution affecting the aquatic and terrestrial ecosystems. Main sources of heavy metal pollution are industrial waste, domestic sewage and landfills. Landfill sites are one of the major sources of heavy metal pollution which affect the soil and water around it. Various types of wastes such as waste food cans and scrap metal and the indiscriminate dumping of household hazardous waste and electronic waste such as batteries and electronic apparatus generate heavy metals in a landfill. The release of heavy metal into the adjacent environment is a serious environmental concern and a threat to public health and safety. It is important to identify whether there is any risk of contaminating the environment due to heavy metals by landfill leachate. Therefore, the objective of this research had been to determine the risk of soil pollution by heavy metals in landfill leachate produced by one of the municipal solid waste collecting sites in Weligama, Sri Lanka. Soil samples from the landfill site and water samples from a nearby stream were collected, digested with conc.HNO₃ and analyzed for heavy metals such as Zn, Pb, and Ni by Atomic Absorption Spectrophotometry (AAS). Zn, Pb, and Ni were detected to be (in ppm) 74.5, 52.8, and 94.2 in the cultivated land and 101.8, 54.7, and 80.8 in the landfill site respectively. It is possible to conclude that there are no any harmful impacts from this Weligama landfill site as far as the three heavy metals involved in this study are concerned. However, Ni content in the cultivated land is higher than that in landfill site and also higher in some collection points than the regulatory standards of heavy metals in agricultural soil. A possible Pb contamination was indicated in some water samples as its concentration in some points was detected to be as high as 0.05 ppm.

Keywords: *Landfill leachate; heavy metals; soil; water; AAS*

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