

Environmental Health Impacts Due to Solid Waste Disposal of Dhaka City in Bangladesh

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Abstract

An investigation was conducted to assess the environmental health impacts of solid waste disposal on the surrounding environment of Dhaka city. Three distinct locations such as current dumping, abandoned and its surrounded agricultural areas of Matuail landfill were selected for waste disposal soil and plant samples, leachate from active dumping and fish samples from treated leachate pond. The Zn, Cu, and Pb concentrations were significantly ($P < 0.05$) high in the dumping ($801 \mu\text{g g}^{-1}$ Zn, $375 \mu\text{g g}^{-1}$ Cu, and $482 \mu\text{g g}^{-1}$ Pb) and abandoned ($502 \mu\text{g g}^{-1}$ Zn, $202 \mu\text{g g}^{-1}$ Cu, and $609 \mu\text{g g}^{-1}$ Pb) areas that exceeded the permissible limits caused serious environmental health impacts. The heavy metal concentrations in plant samples did not show any significant ($P > 0.05$) contamination except Zn, Cu, and Pb that also exceeded the permissible limits. On the other side, the organic matter and nutrient concentrations such as N, P, K and S of both soil and plant samples are within desirable value in the studied area. The untreated leachate concentrations of DO, BOD, COD and TDS of were found 1.39 mg L^{-1} , 99 mg L^{-1} , 1242 mg L^{-1} and 6920 mg L^{-1} , respectively that exceeded inland surface water standard. However, after treatment the concentrations of DO, BOD and TDS in the treated leachate pond were found within the permissible limit. The presence of heavy metal in leachate is not contaminated as it is below the toxic limit. The bioaccumulation of fish from treated pond is extremely high of Fe, Mn, Pb and Ni that exceeded the WHO's permissible limit also caused human health threat. The value lies in the organic waste soil part which forms above 80% of total generated waste have strong potential value that could be easily converted into compost. City corporation point of view, organic waste recycling through composting may reduce disposal cost and prolong the life span of disposal sites that strongly reduces adverse environmental impacts caused by landfill sites. However, among the major environmental and human health concerns confronted in this research are problems relating to inappropriate management of solid waste disposal that needs immediate management action to drop these environmental and human health issues.

Keywords

Solid Waste Disposal, Environmental and Human Health Impacts, Matuail Landfill.