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IMPACT OF LANDFILL LEACHATE ON GROUND AND SURFACE WATER QUALITY

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Abstract

Sanitary landfills are safe disposal sites for household wastes. It provides a safe and clean environment to the urban dwellers. However, an unlined and unprotected landfill can lead to a miserable condition for the landfill location and its command area. Leachate may contaminate the water sources, Odors may cause great discomfort to people, and the litter spread by animals and birds can create a nuisance. The City Hut landfill site is an unlined landfill site on the outskirts of Rajshahi City. This study was conducted to assess the overall hygiene condition and the effect of its leachate on the different water sources around it. Analyses were conducted on water samples from deep wells, shallow tube wells, and surface water near the Rajshahi City hut landfill to understand how the sanitary landfill affects groundwater and surface water quality. Samples were collected from three groundwater sources and three surface water sources in the vicinity of the landfill area. Examination of various parameters including pH, turbidity, conductivity, total solids, total dissolved solids, total suspended solids, chemical oxygen demand, dissolved oxygen, biochemical oxygen demand, alkalinity, hardness, and organic content were carried out. Using these parameters, the Water quality index (WQI) and Overall index of Pollution (OIP) have been determined. The WQI results showed that water quality varied at the selected sampling sites among excellent (SP-01 to 03) and good (SP-04 to 06) categories. Overall Index of Pollution (OIP) demonstrated that sources were in the slightly polluted (SP-01 to 03 and SP-05 to 06) and polluted (SP-04) categories. In the case of the limit of WHO and BDS standards, the SP-04 has exceeded them. The six water samples were used for the study, revealing that while all sampling stations exhibited some pollution, treatment is necessary before use. Proper lining and management of the landfill site can save vital water sources as the sources are not extensively polluted yet.

Key words: landfill, leachate, OIP, water quality, WQI

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