

Effect of Solid Waste on the Sustainability of the Water Resource Quality in the Gbarain Catchment of the Niger Delta Region of Nigeria

Authors : Davidson E. Egirani, Nanfe R. Poyi, Napoleon Wesley

Abstract : This paper would report on the effect of solid waste on water resource quality in the Gbarain catchment of the Niger Delta Region of Nigeria. The Gbarain catchment presently hosts two waste-dump sites located along the flanks of a seasonal flow stream and perennially waterlogged terrain. The anthropogenic activity has significantly affected the quality of surface and groundwater in the Gbarain catchment. These wastes have made the water resource environment toxic leading to the poisoning of aquatic life. The contaminated water resources could lead to serious environmental and human health challenges such as low agricultural yields to loss of vital human organs. The contamination is via geological processes such as seepage and direct infiltration of contaminants into watercourses. The results obtained from field and experimental investigations followed by modeling, and graphical interpretation indicate heavy metal load and fecal pollution in some of the groundwater. The metal load, Escherichia coli, and total coliforms counts exceed the international and regional recommended limits. The contaminate values include Lead (> 0.01 mg/L), Mercury (> 0.006 mg/L), Manganese (> 0.4 mg/L and Escherichia coli (> 0 per 100ml) of the samples. Land use planning, enactment, and implementation of environmental laws are necessary for this region, for effective surface water and groundwater resource management.

Keywords : aquatic life, solid waste, environmental health, human health, waste-dump site, water-resource environment

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