

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

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This paper would report on the effect of solid waste on water resource quality in the Gbarain watershed of the Niger Delta Region of Nigeria. The Gbarain watershed presently hosts two waste-dump sites located along the flanks of a seasonal flow stream and seasonally water logged terrain. The area selected for this study is in the Southern flank of the Niger Delta Region of Nigeria (6° 2' 0" E-6° 8' 0" E, and 4° 42' 0" N-4° 46' 0" N). The study involved the collection of over 75 water samples within the watershed. Triplicate samples were taken per each sampling and were later transported to the laboratory for analysis. One of these samples was collected at its natural pH, in 2l polyethylene bottles after rinsing several times with water from the point of collection for chemical and bacteriological analysis. These samples were analyzed for the metal load using Atomic Adsorption Spectrometer. The quantitative bacteriological analysis was conducted to determine the total bacterial count, total coliforms and *Escherichia coli*. The standard plate counting (SPC) method was used to enumerate the total bacterial count. The nutrient Agar was prepared and ethanol-sterilized for *Escherichia coli* assay. The results obtained from field and experimental investigations followed by modeling and graphical interpretation indicated heavy metal load and fecal pollution in the Gbarain watershed. The metal load, *Escherichia coli* and total coliforms counts exceeded 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. This paper would recommend the application of a clay liner for the containment of leachates in the Gbarain watershed. Land use planning and implementation of environmental laws are necessary for the effective management of the Gbarain watershed.

Keywords: Aquatic life environmental health; human health; solid waste; waste-dump site; water-resource environment.

Biography:

Dr. Davidson Egirani (Ph.D. Environmental Science), now he is a Senior Academic of Environmental and Applied Geology, Head of EAAWRE Research Group on the aquatic environment. He got his B Sc, M Sc in the Earth Sciences at Ibadan and PhD in Environmental Science at the University of East Anglia, United Kingdom. He got Thomas Edison Award-2014 in Energy and Environmental Science for Inspiration and Knowledge Distribution among young research scholars. Currently, Dr. Davidson Egirani research focuses on the effect of anthropogenic activities on aquatic environment, with special emphasis on the reduction of toxic metals in agricultural and industrial systems using mineral adsorbents. He has published over 70 articles that have been cited over 150 times. As a Lead Consultant, he got practical experiences in providing expert advice on the effect of mine water chemistry on agricultural land, cutting across Asia, Africa and the United Kingdom. Dr. Davidson Egirani is a visiting lecturer to International Universities. He is a member of several international professional organizations inclusive, International Medical Geology Association and Council for Nutritional and Environmental Medicine in the United States of America.