

Elemental spatial distributions and health risk assessments of soils around selected dumpsites, south-western Nigeria

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The concentrations and identifications of inorganic elements in soils of Saje, Ita-Oshin, Premier, and Oke-Diya dumpsites were determined through X-Ray Fluorescence analytical method to assess the soil quality through elemental chronological changes with depths. Fifty-six soil samples were collected using a soil core sampler. The results revealed high mean concentrations of Ti, Ca, Rb, Fe and K in Saje samples; Fe, K, Ti, Ca, Zn, Mn and Ni in Ita-Oshin samples; Fe and K in Premier samples; and Fe, Ca, Zn, Ti, K, Mn, V, Cr, Ni and Rb in Oke-Diya samples at all depths. The contamination index revealed the topsoil (0-20 cm) to be more polluted than the subsoil (20-80 cm), and the soils generally indicated high pollution load index. Saje and Oke-Diya samples were enriched from anthropogenic and geologic sources, while Ita-Oshin and Premier elements were from geologic sources. Saje and Oke-Diya samples revealed adult and children unacceptable non-carcinogenic risks, while Ita-Oshin and Premier samples showed acceptable limits. Saje and Oke-Diya samples indicated high carcinogenic risks for adults due to Cr, Pb, and As. The Cr and As in Ita-Oshin samples and Pb in Premier samples evinced unacceptable carcinogenic risks for adults. Saje, Oke-Diya, and Premier samples showed unacceptable carcinogenic risks for children due to Cr. The overall results revealed toxic elements in the soil profiles to depths above 80 cm, and the study areas are not suitable for growing crops and sinking water wells or boreholes.

Biography

Akintayo O. Ojo is a teacher and researcher with about a decade experience working and training in the fields of Physics and Geophysics. He has clear dedications to geophysical and hydro-geochemical related researches in which he had published some articles in some notable journal outfits. Dr. Ojo has carried out researches on environmental geophysics involving rocks and groundwater exploration, pollution, and securities within the southwestern region of Nigeria. To achieve these, he channeled his focuses on the assessment of environmental pollutions using geophysical, hydro-geochemical and radiometric methods. He has attended workshops and seminars where he had been able to showcase his research works. He has the ability to teach, build and manage relationships with people of diverse groups.