

Paper Number: 730

## **Geochemical assessment of soil, sediments and water within and around artisanal mine sites in Southwestern Nigeria.**

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Geochemical assessments of 30 stream sediments, 15 soil and 16 water samples taken within the vicinity of both abandoned and active artisanal mine sites in Ilesha Southwestern Nigeria were carried out using Inductively Coupled Plasma Mass Spectrophotometer (ICP-MS) to determine 56 major and trace elements.

The results of soil and stream sediments show that all the major elements are within Crustal Average and Average Shale Concentration which are used as background values respectively except Fe, Na and P. Most of the soil and sediment samples show that Cu, Pb, Zn, Ni, Co, Mn, Th, V, La, Cr, Ba, Sc, Se, Pr, Nd, Ta and Nb are much higher than background values, Y, Sm, Eu, Gd, Tb, Dy, In, and W are slightly higher than background values while As and Cd although have low values may still pose risk to human health.

Result of different contamination indices such as enrichment and contamination factors revealed that soil and sediments show extremely high enrichment with Zn, Mn, Fe, Th, La, Cr, Ti, Sc, Ce, Pr, Nd, Sm, Gd, Ta, Nb and In, significant enrichment with Pb, Co, W, Eu and Dy and low enrichment with Mo, Cu, Ag, Co, V, P, La, Ba, Al, Sn, Y.

The ecological risk index show that soil and sediments fall within low risk index with Zn, Ni and Cr, moderate risk index with Cu, considerable risk index with Pb and very high risk index with Cd. Potential ecological risk factor (RI) ranged between low to considerable risk of toxic metals to the environment.

The total chronic hazard quotient index of oral exposure to soil contamination in the study area (THI) ranged between 1.58 and 22.69 for children and 0.28 and 4.05 for adult which indicate moderate to high hazard exposure. Twenty five percent of the water samples show pollution index (PI) above 1 with highest contribution (37.8%) from Pb. Manganese, Al, Ni, Fe and As contributed 29.3%, 19.13%, 8.66%, 4.25% and 0.82% respectively.

