

Paper Number: 32

Heavy Metals Pollution of Streams and River Sediments in parts of Akpabuyo Local Government Area, Nigeria and its Implication for Agricultural Practices and Environmental Protection

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This study was initiated to evaluate the spatial distribution of heavy metals in streams and river sediments in parts of Akpabuyo, Cross River State, Nigeria. Surficial streams and river sediment samples were taken from 10 sampling stations and analysed for availability of Fe, Zn, Mn, Cr, Ni, Co, Cu, Cd, and Pb. The concentrations of the heavy metals were found to be in the ranges (mg/kg): Fe (144.45 - 564.76), Zn (19.56 - 44.36), Mn (11.93 - 30.06), Cr (9.75 - 27.68), Ni (6.56 - 18.04), Co (5.36 - 56.41), Cu (3.35 - 6.80), Cd (1.18 - 2.91), and Pb (1.34 - 4.41). The order of concentration in most of the streams and river sediments were found to be: Fe > Zn > Mn > Cr > Ni > Co > Cu > Pb > Cd. The sediment quality indexes used were Geo-accumulation index, contamination factor and pollution load index. The Geo-accumulation index values for Cd ranged between 1.4 and 2.7, indicating moderate to severe contamination and that of Co in Ekpene Tete was 0.985, implying moderate contamination. The contamination factor value for Co in Ekpene Tete was 2.969, indicating moderate contamination factor, while that of Cd in the entire sampling station ranged between 3.953 and 9.717, implying considerable to very high contamination factor. Also, the pollution load index values indicate that these metals ranged around background levels, with exception of Cd at all sampling stations, indicating pollution. Furthermore, comparison of the heavy metals with other studies showed that the concentration of Cd in the study area was higher. The high concentration of Cd in the study area is possibly due to weathering of rocks and minerals in the nearby Oban Massif and Calabar Flank and farming activities in the area. The toxic level of Cd has negative implications for the environment and the food chain since the area is agrarian.

