ASSESSMENT OF TOXIC ELEMENT POLLUTION IN THE TEMA METROPOLITAN AREA

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ABSTRACT

The soil, sediment and water samples in both the inland and the port of the Tema Metropolitan Area were analyzed to ascertain toxic element pollution levels due to anthropogenic activities. In all, thirty five soil samples were taken in the inland surface; 16 sediment samples from the Tema Port; and a total of 20 water samples were taken at both the inland surface and the Tema Port.

Toxic elements determined were As, Hg, Pb, Cd, Al, Co, Ni, Cr, and Zn. Soil parameters that are considered influential to toxic element enrichment and accumulation in both soil and water such as pH, electrical conductivity, salinity and temperature were also determined. Statistical analysis showed negative correlations between conductivity and As, Hg, Al, Co, and Ni, while conductivity correlated positively with Pb, Cr, Cd and Zn. Correlation was significantly positive between As and Co; Co and Ni, suggesting possible common origins for these elements.

Generally, however, correlations between the toxic elements were not significant, which could mean that the origin and existence of these elements were independent of one another.

Most samples were within the permissible limits for As, Pb, Co, Ni, Cr, Hg Cd, Al, and Zn. Samples from some locations had the concentrations of the element above acceptable levels. The difference in land use practices had some level of influence on the concentration of the toxic elements in samples from the different locations. The industrial area recorded higher levels of the element than the Tema Port, while the residential areas had the lowest level of the elements. Concentration of each element at a particular location depended on the kind of activity that goes on at that location.

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