

Cadmium contamination of Wetland Sediments in part of Lagos Metropolis, Nigeria

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Cadmium (Cd) is a known human carcinogen and its occurrence in environmental media had elicited several research interests globally. However, despite the toxic, non-degradable properties and the health effects of Cd contamination that have been reported, very little is known about its presence and potential effects in developing countries such as Nigeria. This study was therefore undertaken to assess the level of cadmium contamination in Lagos metropolis wetland sediments and the potential health effects.

Wetland core (30cm length) sediment samples were collected from identified wetlands in Lagos metropolis. The samples were dried, prepared and analysed for Cd contents using ICP-MS. Result was compared with statutory guideline values and evaluated using geochemical and, ecological and health risk assessment methods.

Cadmium concentration ranged from 1-73mg/kg. Cd concentration in all the wetland sediments was observed to be greater than statutory guideline levels as specified by the WHO/FAO (0.05-0.5mg/kg in food), UNEP (0.03-0.3mg/kg) and EU (0.05mg/kg). The calculated mean value for Cd (23 mg/kg) in the wetland sediments was greater than the Effect Range Median as proposed by USEPA (ERM, 9.6mg/kg) indicating a very high likelihood to cause adverse biological effects. Calculated Geo-accumulation and Contamination Factor revealed considerable to very high contamination for Cd while the calculated Pollution Load Index was >1 indicative of deterioration of the sediment quality. Ecological assessment revealed high risk with mERM-Q (Effects Range-Median Quotient) values for Cd greater than 1.5mg/kg in the wetlands' sediments indicating highly toxic sediments. The calculated Daily Intake values and Total Chronic Hazard Quotient Index (THI) was > 1 and showed that elevated ecological health risk.

The current Cd status of the wetlands' sediments is of concern as portions of the wetlands are currently cultivated for vegetables. This could provide appropriate pathway for bio-transfer of Cd into the population that may result in debilitating health conditions