Heavy metal pollution assessment in stream sediments from an active mining area in Okpella, Nigeria
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The main aim of the study is the assessment of heavy metal pollution level in the stream sediments from a mining site in Okpella, Edo State, Nigeria. Standard geochemical sampling and sample treatment techniques were used. The samples were analyzed using energy dispersive X-Ray fluorescence method. The concentrations of As, Co, Cr, Cu, Hg, Ni, Pb and Zn were determined using 11 sediment samples collected from River Uza and its tributaries where gold is being actively mined. River Uza also receives discharged marble mine water. Enrichment Factor (EF) and geo-accumulation Index ($I_{geo}$) were applied to the laboratory result to assess the level of heavy metal pollution in the area. The sediments show a heavy metal concentration trend of Cu>Zn>Pb>As>Cr>Hg>Ni>Co. The EF results revealed extremely severe enrichment of Hg, moderate enrichment of Cu, minor enrichment of As and Pb and no enrichment of Co, Cr, Ni and Zn in the sediments. The $I_{geo}$ also showed that the sediments were extremely polluted with Hg, unpolluted to moderately pollute with Cu but unpolluted with all the other heavy metals. Extreme pollution of the sediments by Hg and its enrichments in Cu, As and Pb are due to indiscriminate active artisanal gold mining in the area. It is recommended that immediate remediation protocols should be enforced to mitigate the possible environmental health hazard to humans and animals in the area.

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