

Isotopic and geochemical characterization of water, rocks and sediments in Gold mining - impacted regions of Lake Victoria Goldfields, Tanzania

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Gold mining activities in the Lake Victoria Goldfields regions have raised concerns about the contamination to terrestrial and aquatic environment due to potentially toxic elements and natural occurring radionuclides, which could be released during mining activities. This study integrated isotopic (Pb and U) and geochemical analysis to trace pollution source, contribution from each source, assess elemental mobility and evaluate radiological risk to biota and humans from mining impacted areas. Multi collector Inductively coupled Mass Spectrometer, Gamma Spectrometry, and Alpha Spectrometry were employed in quantification of trace elements and radionuclides activity concentrations. Isotopic ratios of lead and uranium were used to differentiate between geogenic and anthropogenic contaminants. Multivariate statistical analyses were used to explore elemental association and pollution pathways. Additionally, a radiological risk assessment was conducted to evaluate potential hazards to human population and aquatic biota. Preliminary analysis suggests that Pb and U isotopic composition may reflect contributions from geological sources, mining activities and agricultural inputs. Moreover, other results of this study including temporal trends, pollution sources, and environmental risk assessment in mining impacted regions will be presented.