

Re-evaluating Legacy Mineral Deposits Using GIS and Remote Sensing: A Case Study Approach from Tanzania

Raya Jumanne¹

¹University of Dar es Salaam, Dar Es Salaam, Tanzania

Advancements in geospatial technologies have created new opportunities to reassess previously explored or underutilized mineral deposits. This study investigates the application of Geographic Information Systems (GIS) and remote sensing techniques in the re-evaluation of legacy mineral deposits in Tanzania. Many historical exploration sites were assessed using limited data and outdated methodologies, resulting in potentially overlooked economic resources.

Using satellite imagery, digital elevation models (DEMs), and spatial analysis tools, this research demonstrates how modern techniques can improve geological mapping, identify structural controls, and delineate zones of mineralization. The integration of multi-source datasets enhances the understanding of orebody geometry and surface expressions, particularly in regions affected by weathering or vegetation cover.

The findings suggest that revisiting old deposits with new technology can significantly reduce exploration costs and risks while increasing the potential for resource expansion. This approach is especially relevant in developing countries, where financial and technical constraints limit large-scale exploration.

The study aligns with the goals of the Society of Economic Geologists by highlighting innovative strategies for sustainable resource development and demonstrating the value of combining traditional geological knowledge with modern analytical tools.