

The use of Geographic Information Systems (GIS) in mineral resources development in Tanzania

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Abstract

Geographic Information System (GIS) is the management of data which is related to specific locations on the earth, basically a computer-assisted system for acquisition, storage, analysis and display of geographical data. The GIS has many applications in the integration of different data sets obtained through geographical mapping.

As the success of mineral exploration depends very much on the integration of geological, geochemical and geophysical data the application GIS system greatly simplify this task which has traditionally be done manually. Apart from the basic technical data, the second most important data set required by any serious mineral investor pertains to the infrastructure government administration and available social service in the target area. Thirdly, but equally important companies investing in the mineral sector require information on the state of availability of open grounds.

Tanzania has abundance of geological data accumulated over years since the 1880's. Such a comprehensive collection of basic data is a major asset in the evaluation of the country's mineral resource potential by potential investor in the mining industry. The Madini Archive in Dodoma contains a substantial number of published and unpublished documents dealing with a wide variety of geotechnical topics. The Mineral Data Bank in Dodoma, which was established in the early 1990's with the assistance of the UNDP, has laid the foundation for the setting up of a fully functioning GIS dedicated to mineral resource development. The system at present consists of three sub-units, namely cartography, mineral database and statistics. The cartography sub-unit has already digitised maps, which depicts the geology, mineral occurrences, drainage systems, countries boundaries and mineral titles. The database sub-unit can now produce geological reports on reserves and production for over 400 known mineral occurrences in the country. The statistics sub-unit

serves as a custodian of mineral production and sales data mainly from the Mines Department.

In future, the Tanzanian economy is more likely to depend on the mineral industry than on the agricultural and manufacturing industries. The main role of GIS to mineral development in Tanzania is to provide the basis for the integration of organisational information processing - a role which is very vital for mineral promotion. A well designed information system will have capability to link or merge one dataset with another; analyse spatial characteristics of data and search for patterns of particular of interest in a given area.