Management of Geological Information for Mining Sector Development and Investment Attraction – Examples from Uganda and Tanzania

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Data is Money!

- **Billions of Dollars** were spend for mineral resources and geological exploration
- **Data** is stored as paper files & different data formats
- **Data** is the key issue for:
  - Mining investment attraction
  - National development
  - Land use and infrastructure planning
  - Environmental protection
  - Geo-hazard prevention
  - Forestry, water supply, ....
How to Make Data Available?

- Have data „on stock“
- Centralise data management
- Standardize data structures and coding
- Have instruments for data distribution
- Regulations for data release/ usage

→ Manage data independently from the further use
→ Guarantee data security
→ Prevent loss of data

→ Information Management System
Beak Consultants GmbH: advangeo® Software Solutions
Case Study Locations

Uganda:
2007 – 2012
WB funded

Tanzania:
2013 – 2016
WB funded
Case Study 1: Uganda – Project Overview

<table>
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<tr>
<th>Task</th>
<th>Beneficiary:</th>
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<td>Establishment of a Modern Documentation Centre</td>
<td>Department of Geological Survey and Mines</td>
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- Ensure access, efficient storage, search, retrieval, and dissemination of geological information
- Strengthen information sharing and exchange among geo-science stakeholders
- Establish a website through which effective dissemination will be coordinated and enforced

2008

Beneficiary: Department of Geological Survey and Mines

Project Team
Case Study 1: Uganda – *Software Architecture*

- **Library (published documents)**
  - Catalogue Web Research (Web-OPAC)
  - Main Processes
    - Catalogue input
    - Lending Process
- **Document Archive (unpublished documents)**
  - Procurement Process
  - Sorting out Process
  - Document Research and Document Download
  - Input Metadata
  - Scanning
  - Lending Process
  - Reporting / Export
- **Electronic Records Management System (ERMS)**
  - Registry Part: incoming, outgoing mails, filing
  - Officers Part: black remarks, processing
  - Sorting out Process
  - Process of Archiving
  - Reporting / Export

- **Library Database**
- **Document Archive Database**
- **ERMS Database**
Case Study 1: Uganda – Library Software (LIBERO)

24,000 media captured
Case Study 1: Uganda – Web Catalogue

Library Stock of the Department of Geological Survey and Mines Uganda (DGSM)

The Documentation Center of the DGSM in Entebbe contains published books and journals managed by a professional library software called LIBERO. Here you can query the exported metadata and find location codes of the books. Please contact Documentation Centre staff for further information (www.uganda-mining.go.ug).
Case Study 1: Uganda – Hardware and Furniture
Case Study 1: Uganda – *Unpublished Documents Information System (UDIS)*

- Metadata
- Scanned document
- (Archived document)
Case Study 1: Uganda – UDIS User Interface
Case Study 1: Uganda – UDIS Module & Document Download
Case Study 1: Uganda – Web UDIS
Case Study 1: Uganda – Geocoded Document Search on GMIS
Case Study 1: Uganda – Electronic Record Management System (ERMS)
Case Study 1: Uganda – Website

www.uganda-mining.go.ug

Monthly statistics:

- Visitors:
  - Average: 750
  - Maximum: 1500

- Days:
  - Mainly Mon – Wed
  - Barely Fri – Sun

- Time:
  - 70 % < 30 sec
  - 20 % > 5 minutes
Case Study 1: Uganda - Benefits

- **Metadata** for new reports can be captured, which allows for proper storage and future search and use.
- Reports can be **linked to maps and samples**.
- Local and international users can access all documents and reports and can **download reports** by themselves.
- It is user friendly and new staff can use it to **locate documents** and students are using it for **research**.
- Sister departments in Kenya are **learning from it** and also trying to improve their own.
Case Study 1: Uganda - Benefits

- **Reduced workload** on user support as less physical visits are done to the Documentation Center since users can download online → Number of physical visits has reduced

- **New clients** request for more information by email after reading the metadata online → Number of email requests has increased

- **Good management** of reports and **improved transparency** due to availability / accessibility of geoscience information

- **Investment attraction** has increased → **Increased licensing status**
Case Study 1: Uganda - Issues

- Needs **continuous support** to be able to maintain the technology → Website currently off due to pending procurement process for renewal of website maintenance contract

- Problem of **power fluctuations** affects the server indicating some down period (not accessible sometimes)

- Need **more training** on use of the system and the need to embrace **change to digital workflows**
Case Study 2: Tanzania – Project Overview

Task
Preparation of Geoscientific Data Information Management System

Beneficiary
Ministry of Energy and Minerals Geological Survey of Tanzania

- IT Infrastructure issues
- **GMIS Design and Implementation**
- 60 QDS Map Sheets
- **Minerogenic Map**
- Data Dissemination Policy
- Library and Archive
- Museum, Rock Store and Core Depot
- **Investment Promotion**
- Remote Sensing Unit
- Training

Project Team
Case Study 2: Tanzania – GMIS User Interface

The GMIS Portal – Gate to:
- 20 technical modules
- System administration module
- GIS module
Case Study 2: Tanzania – Library Module
Case Study 2: Tanzania – Archive Module

![Image of the Archive Module interface]

The Archive Module allows users to search and access geological and mineral information from Tanzania. The interface includes options to filter and sort reports by various criteria, such as archive number, title, issuing company, and year. Users can also view abstracts and physical descriptions of the documents. The module is designed to be user-friendly and accessible, providing a comprehensive tool for researchers and professionals in the field of geology and mining.
Gold Potential Map of Tanzania outlines areas with potential for Gold occurrences.
Case Study 2: Tanzania – Potential Mapping Using Existing Data

**Input Data**
- Magnetics: TMI/RTP and 1st derivative
- Radiometrics: U, Th, K & their 1st derivatives

**Training Data**
- Mineral occurrences: Gold in greenstones belts

**Gold Potential Map of Tanzania**

**Detail Map: Londoni Area**
Case Study 2: Tanzania – Website

Welcome to Geological Survey of Tanzania

The Geological Survey of Tanzania (GST) is the government agency responsible for the acquisition and storage of geoscientific data and information used in the mineral resources sector and other sectors of the economy. GST is active in promoting mineral exploration and mining in Tanzania. GST core activities range from geological mapping, mineral exploration, evaluation, and processing, and research work on geological processes and mineral systems and geohazards. GST’s vision is to evolve as a centre of excellence providing national geoscientific data and information for use in the evaluation and sustainable utilization of natural resources. GST maintains a balance of resources between its primary responsibilities of conducting geological mapping, geodata management, technological and conceptual research and development, and providing services to both public and private sector.

Quick Links
- Geological and Mineral Information Systems
- National Bureau of Statistics-NBS

LATEST NEWS
Tanzania Electricity Supply Industry Reform Strategy and Roadmap 2014–2025

Geological Mapping
- GST’s mapping programmes produce basic information for the needs of the mineral sector
- Read more

Geological Resources
- Resources in mining engineering, geophysics, geoinformation and BSc in various disciplines of science
- Read more

Price List
- Laboratory Services
- Geophysical Digital Data
- Geochemical Data
- Geo Publications
- Map preparation
- Museum visit charges
Case Study 2: Tanzania – Web GMIS

www.gmis-tanzania.com
Case Study 2: Tanzania – Data Sales Portal

www.gst-datashop.com
Case Study 2: Tanzania – Benefits

• Centralised database implemented:
  • User policies implemented
  • People are really using the system
  • Geological and archive data under one roof
  • Link to mining cadastral data implemented

• Interactive web site implemented:
  • Approx. between 100 and 400 visits / week
  • Data sales platform ready

• Infrastructural environment:
  • Acceptable
  • Central Server, Back up services,
  • Intranet, Internet

• Personnel:
  • Qualified IT, GIS, database staff available
Information Management Systems (IMS):

- **Small but reliable system** is better than a big system with bad data, bad software, slow infrastructure → Unused systems will die
- Must be **integrated into working processes**
- **Stakeholder involvement** integration from the beginning
- Expensive, **life time is short**: 5 – 8 years
- Bad **environmental conditions may destroy** a good system
- **Correct & complete data** is a must
- Require **clear procedures and policies**
Documentation Centre:

- Serving clients and investors
- Maintaining hardware and network
- Constantly updating all information systems
- Filling the website with news
- Further training for staff

GEOLOGICAL SURVEY OF TANZANIA
Beak Consultants GmbH

Your Partner for Mineral Exploration, Information Management and Investment Attraction!