Geoscience Information in Africa (GIRAF):

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GIRAF coordinator

Dar es Salaam, CAG 25
15th August, 2014
Agenda: 5 “W”s

- What is the GIRAF network
- Why the GIRAF network
- Who is the GIRAF network
- Workshop and achievements
- Where does the GIRAF go from here?
Network on Geoscience Information in Africa for geological survey organisations, universities and research institutes and private companies.

- initiated by the Commission on Geoscience Information (CGI) of the IUGS
- founded with support of the German Federal Ministry for Economic Cooperation and Development, the IUGS-CGI, the Geological Survey of Namibia, BGR, and Southern Mapping
- coordinated by the CGI and UNESCO-Africa
GIRAF Mission

Support that knowledge-based geoscience information contributes to improve the environmental & economic prosperity of the people in Africa.
**Why a GIRAF network**

- Many isolated geoscience information projects within Africa
- Only rarely existing: African Geoscience information standards
- Vast amounts of inaccessible data and research results
- Education and training: Find and retain skilled people
- Fragmentation of institutional responsibilities
- Government and administration often unaware of the importance of geoinformation
- Strengthen connections and linking with neighbour countries
- More cooperation with the mining sector and private companies
GIRAF Aims

• Build a pan-African geoscience information knowledge network of geological surveys, universities, research institutes and companies.

• Stimulate and support cross-border geoscience information projects and initiatives in Africa.

• Make Africa a more active part of the international geoscience information community.

• Encourage the creation of African cross-border geoscience information standards and

• Encourage the contribution to international and global standards
37 African GIRAF countries
7 countries outside Africa involved
> 350 members mainly in Africa and around the world
37 African GIRAF member countries

- Algeria
- Angola
- Botswana
- Burkina Faso
- Cameroon
- Central African Republic
- Congo
- DR Congo
- Egypt
- Ethiopia
- Gambia
- Gabun
- Ghana
- Ivory Coast
- Kenya
- Lesotho
- Liberia
- Madagascar
- Malawi

Associated Organisations:

- Geological Society of Africa (GSAf)
- SEAMIC
- African Association of Women Geologists (AAWG)
- Young Earth Scientists (YES)
- Commission of the Geological Map of the World (CGMW)
- OneGeology
- AEGOS

- Mali
- Morocco
- Mozambique
- Namibia
- Nigeria
- Ruanda
- Senegal
- South Africa
- Southern Sudan
- Sudan
- Tanzania
- Togo
- Uganda
- Zambia
- Zimbabwe
Who -
14 GIRAF Ambassadors
Organise and realize:

2007 Preparatory workshop at CAG 22, Mocambique
2009 Kick-off Workshop of GIRAF, GSN, Namibia (incl. short courses on GeoScience ML and Freeware)
2011 GIRAF workshop with AEGOS & OneGeology at CAG23, Jo‘burg
2011 2nd GIRAF Workshop, SEAMIC, Dar es Salaam (incl. short courses on GeoScienceML and Freeware)
2012 Int. Geological Congress, Brisbane: GIRAF course at Sustainable Mining in Africa Workshop, GIRAF presentation, Booth Flyers:
  -> >72 new members, 8 new African countries
2012 Geoscience Information session at CAG24, Ethiopia
2013 3rd GIRAF Workshop, September, Ghana
2014 – Geoscience information Workshop at CAG 25
First Announcement

GIRAF 2013 - The 3rd Geoscience Information in Africa Workshop
By Dr. Kristine Asch, GIRAF coordinator, BGR, Germany

From 23-27 September 2013 the 3rd GIRAF Workshop will take place in Accra (Ghana). The event will be organised by the CGI together with AusAID’s International Mining for Development Centre, the UNESCO and BGR. The workshop will take place to coincide with the centennial celebrations of the Geological Survey of Ghana who have kindly offered to host the meeting. The main subject will be ‘Geoscience Information and Sustainable Mining’.

Please register your interest at http://www.giraf-network.org where you can also find actual information about the event.

Actual Projects of GIRAF Members

Politique Minière
By Armel Nganzu, Central African Republic

Le 22 juin 2012, le ministère des Mines, en partenariat avec la Banque mondiale et l’USAID, a validé sa déclaration de politique minière au cours d’un atelier qui a réuni 150 représentants des autorités centrales et provinciales, des bureaux d’achat et de distribution, des compagnies minières et des organismes de recherche. Le secteur minier artisanal emploie 500 000 personnes et touche, par ses effets multiplicateurs, 60 % de la population. Cependant, l’ensemble du secteur ne contribue qu’à 2,4 % des recettes de l’Etat. Celui-ci redistribue donc peu de ces ressources fiscales aux populations locales.
Where does the GIRAF walk from here?

- **2015** - 4th GIRAF Workshop in Mocambique
- **2016** – GIRAF session at Int. Geol. Congress in Capetown
- **2016** - 5th GIRAF session at CAG 26 in ….?
- **2017** - 5th GIRAF workshop in ….?
GIRAF!!!
Africa
a continent full of riches

- natural resources,
- a wealth of cultural heritage,
- beautiful landscapes

- ... but pressing issues - poverty, water supply and poor health.
- Geoscience information and good practice can play a major role in locating energy and mineral resources, clean water and mitigating geological hazards (including the impact of climate change).

Addis Ababa, CAG 24
January 14, 2013
GIRAF!!!
The participants agreed on:

- Establish network within Africa to connect geological survey institutions
- Support nations with lack of capacity and capability
- Set up of management group to ensure that GIRAF is sustained
- Set up of Website with national contact details, news, links
- Organise biannual workshops of GIRAF
- Nominate African delegates to IUGS-CGI, OneGeology
- Get a Geoscience Information Session into the IGC 2012
- Start and distribute a Newsletter
- Organise funding and sponsorship to support GIRAF-work
- Pursue training and scholarships at existing universities.
Who - GIRAF Steering Committee

• John Agyei Duodu Director Geological Survey of Ghana (chair)
• Mesfin W. Gebremichael SEAMIC, Tanzania (Vice-Chair)
• Aberra Mogessie President Geological Society of Africa (GSAf)
• S. Felix Toteu UNESCO Nairobi
• Ezzoura Erami, president African Association of Women Geologists
• Masresha Gebresillasie Director Geological Survey of Ethiopia
• Gabi Schneider Director Geological Survey of Namibia
• Cecilia Mukosi Council of Geosciences, S.A., YES Network
• Kristine Asch BGR, coordinator GIRAF, bridge to international community
Geoscience Information, Sustainable Mining and Mapping

• Information is knowledge
• Geoscience information is essential knowledge about the ground beneath our feet
• Crossboundary geoscience data, knowledge and information lead to new insights, innovation and discovery

.. and in thus – in the long run to more wealth and health in Africa!
Why GIRAF?

• The giraffe is a beautiful African animal,
• full of confidence and strength
• (and amazingly fast …)
• long neck: a good overview over much more than its close neighbourhood
• The pattern – a metaphor for all African nations
• so a perfect symbolic animal for our Network across the (almost) whole continent of Africa!
A selection of necessary activities identified by the GIRAF members

- Raise awareness of political decision makers on Geoscience information issues
- Influence „law-making“ in the sector of for geoscience information
- Training for members of geological survey staff:
  - Digital field mapping methods
  - Digital reconnaissance exploration (remote sensing, airborne geophysics, regional geochemistry …)
  - OpenGIS
  - Data management and administration
- Support initiation of public private partnerships in the mining sector
- Identify and approach funding sources for the GIRAF member‘s activities
- Communicate via mail, the GIRAF web site and a newsletter.
First known geological map: created in Africa

- the “Turin Papyrus”: a map of a Nubian gold mine in the north today’s Egypt
- created during the reign of King Ramses IV (1151–1145 b.C.)
- depicts gold ore deposits, rock types (sandstone, boulders)
- includes several elements of topography and geomorphology, (some kind of road, a mine workers' settlement, several valleys, Harrel & Brown (1992)
- “the earliest map known“ (Murray, 1946 and Walther, 1994)
“Africa is the world’s top producer of numerous mineral commodities and has the world’s greatest resources of many more, but most of Africa still lacks **systematic geological mapping** which could bring to light a much greater resource base”,
(Africa Mining Vision prepared by the African Union in 2009)
Geological databases: attractive for mineral exploration investment

Research survey by the Fraser Institute (2008):

• 372 mining companies representing 14.8% of the global exploration investment rated the attractiveness of 68 countries (incl: 10 countries from sub-Saharan Africa) based on 15 factors.

• “geological database” incl. quality and scale of maps, ease of access to information by investors) ione of the 15 factors;

Survey encompasses also e.g. legal and taxation framework, political stability, the cost and qualifications of labour, security, good governance or the existence and quality of infrastructure
Recent studies of the cost-benefit ratio of geological mapping (in Spain and USA) documented ratios of 19 (Spain) and 32 (USA).

**Ratio 1 : 19 means-**
for e.g. 1 Euro the society invests in geological mapping, the return will be 19 Euros

(from: Economic and Social Value of the MAGNA Plan – geological maps of Spain at a scale of 1:50 000 published by Instituto Geológico y Minero España, 2005).
Geoscientific knowledge and skills of African geological surveys – a feasibility study

- Feasibility Study for a long-term project
- May be financed by DG DEVCO (Development and Cooperation – EuropeAid) for a period of 12 months, start in 2013
- Main aims:
  - Strengthening of OAGS
  - GAP and SWOT analysis Geoscientific Mapping
  - GAP and SWOT Mineral Resources
  - Digital Methods and tools
The GIRAF network consists of geoscience experts all over Africa. The GIRAF members know well about the problematic (and non-problematic) issues of geoscience information in Africa and possess the knowledge and motivation to contribute to its solution.
**Invitation**

**to the 3rd GIRAF Workshop - GIRAF2013 –**

**in Accra, Ghana,**

**3-5 days in September 2013**

(date to be confirmed here with the local hosts)

During the centennial celebrations of the Geological Survey of Ghana

Organisation: IUGS-CGI and UNESCO-Nairobi

Hosted by the Geological Survey of Ghana

Will include subjects of geoscience information in mapping, mineral resources, sustainable mining, geohazards, and other relevant themes proposed by GIRAF steering committee and individual members.

Presentations, discussion, break-out groups and short courses.
Welcome to the next GIRAF workshop in Ghana, September 2013!
The feasibility study may be financed by DG DEVCO (Development and Cooperation – EuropeAid) for a period of 12 months, start in 2013; The long-term pan-African project is planned to be realised in a period of 10 to 20 years; Concrete figures for the period and budget by the EU are not yet known.
Situation in general

- African countries are increasingly willing to upgrade their geoscience knowledge infrastructures, inc. the fundamental ability to make new geological maps (e.g. Ghana, new survey project 1 : 100.000)

- The geological surveys in Europe took part in the geological mapping in Africa in the past and present (e.g. by technical development projects or World Bank) or private sector contracts.

- A joint EU-Africa initiative in the field of geological mapping would greatly benefit both continents,
In the beginning just some lines in the sand ..... to describe e.g. a flint or salt occurrence ...
Summary

- GIRAF- experts
- Earliest Map ever created in Africa
- Still substantial parts of Africa not sufficiently mapped
• Most of the 54 African states have a “geological survey” and a “mineral management structure”, which plays an important role in the development and the management of the minerals sector.

• A crucial element in this process is to improve the geological knowledge base as well as training of the government institutions involved especially in the mining sector.
Availability and access to geological information in Africa is currently limited

A large percentage of the continent is yet to be geologically mapped in a systematic manner and at an appropriate scale (< 100 000)

Geological maps are a basic tool for countries to take stock of their resources, to attract investors, to grant exploration permits, and to provide practical training to young geologists.
The reasons for these gaps have been discussed at various occasions

The Geoscience Information in Africa Network (GIRAF) stated in its second workshop in Dar es Salaam (SEAMIC) in 2011:

• substantial need of training, including mapping and GIS, within the African geological community.
• lack of financial resources and the need to seek financial support to initiate appropriate training programmes.

Additional fundamental issues stated in the 2009 GIRAF Workshop in Namibia (Geological Survey of Namibia, Windhoek):

• Vast amounts of inaccessible data and research results
• Find and retain skilled people.
• Government and administration often unaware of the importance of geoinformation,
• Lack of technical infrastructure, internet access and equipment.
Project Objectives

• Strengthening the cooperation between OAGS and EGS;

• Promotion of the role of OAGS in Africa and augmentation of its recognition by society;

• Contribution to the assessment of the potential of mineral resources in Africa

• Strengthening of the capacities and the role of national geological surveys in Africa, especially in the field of geological mapping and map editing;

• ...
Feasibility Study
Further Project Objectives

- Improvement of data management as well as the use of geoinformation;

- Evaluation of synergies with current corresponding projects in Africa;

- Consolidation of inter-institutional and international networks for capacity building within African geological surveys;
Proposed Major Project Activities and Milestones of the feasibility study

- Identification of the existing and required information and knowledge domains;
- Strength, weaknesses, opportunities and threats (SWOT) analysis of partner institutions;
- Development of a road map and work breakdown structure.
WP 3 - Geoscientific Mapping
Compilation of a map catalogue / index maps of available maps on:

- Geology
- Mineral occurrences, e.g. raw materials, energetic minerals
- Geochemistry
- Geophysics
- Remote Sensing data
Gap analysis:

• to get an overview about geospatial metadata of published and unpublished digital and analogue maps for geology, mineral resources, groundwater, geophysics, geochemistry and imageries on international, national, regional and local scales;

• to identify areas which need more detailed field mapping in those themes;

• to identify the actual and potential users needs and

→ Identification of areas where detailed geological mapping is required

→ to propose recommendations to better the situation.
Deliverables:

D 3.1 – Concept for a web-based metadata catalogues for geodata and maps in Africa, to be compiled in coordination with AEGOS;

D 3.2 – Gap analysis: Report containing an overview on existing available geoscience maps and geodata in Africa as well as a description of the present mapping activities in African countries by national Geological Surveys;

D 3.3 - Concept Note on strategies to strengthen the capacities of African geological surveys in the field of geological mapping and the provision of geodata (maps and web services).
Proposed Major Project Activities and Milestones for the Phase 2 (2014 - 2018)

The project should cover a wide range of tasks divided into the several working packages such as:

- Coordination
- Actions needed to strengthen the OAGS (e.g. development of a new/improved website for OAGS)
- GAP analysis of geoscientific mapping
- Mineral resources assessment gap analysis
  - Primary and secondary sources
  - Artisanal and small-scale mining (ASM)
- Mining and the environment (including post-mining)
Proposed Major Project Activities and Milestones for the Phase 2 (2014 - 2018)

• Geohazards mapping and monitoring
• Geoheritage inventory and its economic significance
• Methods / tools (human resources and capacity building and training for OAGS members and their partners through innovative case studies)
• Development of OAGS Geoscience information infrastructure and management
• Development of OAGS technical infrastructure, laboratories, equipment, facilities
• Dissemination of information about the project and building and running database of the obtained results
• Launching meeting in Warsaw, September 9, 2012 (BGR, BGS, BRGM, CZ-GS, EC, EGS, GEUS, GTK, IGME Spain, IGME Greece, Geo-ZS, LGT, PGI_NRI, SGU, SGUDS)

Next steps 1

Review of the proposal

• **EGS:** 15. 01. 2013

• → preliminary version of the proposal to EU to start the process of commissioning

• **OAGS:** 28. 02. 2013

• Binding and **mandatory** for EGS and OAGS

• **Submission** to EU for financing
Next steps 2

• Each WP will get an **African Co-Coordinator**, nominated by OAGS

• **First draft** of the results of the scoping are expected by **July/August 2013**

• **Final-Workshop** of the Scoping Study with results and planning strategy for phase 2 in **4th quarter 2013 (October/November 2013)** in combination with the annual meeting of OAGS and the Centennial of GSD in Accra
A Gap analysis consists of

- Identify the existing situation
- Identify the desired situation
- Identify the difference -> “gap”
- Identify the process to achieve the desired situation
- Document the gap

- Develop the means to fill the gap (project)
Gap analysis – methods

- Workshops
  - for preparation
  - for performance of activity, check of method
  - for evaluation
- Personal interrogation
- Questionnaire analogue
- Questionnaire digital
- Evaluation and documentation.
- Result: Conclusions and recommendations
Cost estimation:

Cost estimation:
Depending on needed results
person/months, infrastructure, travel costs, workshops

Examples:
OneG-E (interrogates: 20 countries): WP 2 ca 200 000 Euro/2 years/20 person months

AEGOS (interrogated: ca. 50 organisations), 9 WPs, 2 M Euro/3 years
Objectives of the gap analysis

- Field mapping (Geology, groundwater, hazards, engineering geology, geophysical, geochemical ...) - > derived maps: mineral and energy resources, gw resources
- Sampling and testing (petrography, geochemistry, age determination, geophysics, water)
- Interpretation methods
- Publishing methods
Gap analysis for Mapping planning - project

• Build the project team to perform the gap analysis
• Work package definitions
• Draft time frame /road map
• Identify whom to address:
  - 54 Geological survey organisations.
  - Mining Companies (are mapping acc. Their requirements)
  - Universities?
  - Experts, subcontractors?
  - Politicians?
  - International players (OAGS, AU, GSAf, UNESCO, SADC, ..),
  - Centers of excellence (SEAMIC, … )
• (Project collate addresses and contacts)
• (Decide on method)
Examples of questions

• Mapping (Geology, groundwater, mineral and energy resources, hazards, geophysical…) :
  - coverage
  - Scale
  - Themes
  - date of publishing
  technique of mapping: remote sensing, field work, geochemistry , …
  - technique of map production: Analogue/digital

• Staff/skills:
  Field geologists, surveyor, IT technicians, lab technicians,

• Infrastructure:
  Laboratories: geochemistry, petrography, geophysical equipment,
cars
digitizing tools

• Regular sufficient budget
Gap Analysis: Possible Workpackages

- WP 1 Project management
- WP 2 Staff and skills in Africa
- WP 3 Availability of maps (theme, scale, medium, at what costs, distribution, ...)
- WP 5 Mapping Methods and Actual mapping activities
- WP 6 Annual planning of African organisations (budget, political acknowledgement, staff management, mandate for mapping)
- WP 7 African Institutions Infrastructure (labs, technical equipment etc)
- WP 8 Concept and strategy
Project resources: an estimate

Duration: 1,5 years
Partner: important: African partners
8 Workpackages: core teams: 5 – 10 persons
8 Deliverables: At least 1 / workpackage
3 general Workshops (+ ca 3 per WP): 30
Technical meetings
Staff time
Project coordinator: 18 + 4
WP lead: 12 p/m
Contributing partner: ca. 4 p/m
• Work Package Description 1 G-E WP 2
• Start date:0
• End date:18
• Work package title:User cases and best practice in meeting stakeholder needs

• Objectives
  • Identify the current and future, specific and generic needs for geological information products and services by users/stakeholders. Assess how current provision across Europe meets these needs. Identify what the best practice is in meeting these needs and also gaps where needs are not being met (through lack of data, services or barriers to use). Demonstrate and spread the awareness of best practice service provision across the suppliers and potential users in Europe and report on how service provision can be improved.

• Description of work
  • Define, prioritise and summarise the needs of the broad spectrum of users of geological data. Assemble a stakeholder panel representing European, national and local government; insurance, banking and property; environmental protection; sustainable groundwater and soils management; landscape and natural heritage; civil engineering; energy and mineral exploration and extraction; civil protection; natural disasters management; education and research. Organise two workshops at which external stakeholders (users) and providers will discuss a) data and service needs and b) proposed solutions to these. Prioritise the data and service types based on stakeholder demand. Audit of best practice in geological data and service delivery across Europe in meeting that demand. Review and selection (involving Stakeholders) of best practice in existing access (including, viewing and downloading and reporting systems) to high resolution (1:10000 – 1:50000 scale) geological and applied geological data across the EU (including systems covering natural hazards and resources in addition to geological data). Document examples of best practice across a range of users and countries and conduct and report on a gap analysis (demand-provision).
the Geoscience Information in Africa network for African geological survey organisations, research institutes, universities and private companies.

• Initiated by the global IUGS Commission on the Management & Application of Geoscience Information (CGI)
• Coordinated by CGI and UNESCO
• Started with financial support of the German Federal Ministry for Economic Cooperation and Development, via BGR and the Geological Survey of Namibia
• Now supported with modest financial and in-kind contributions from the CGI/IUGS, UNESCO and the individual members’ institutions