

THE CHALLENGE OF RESOURCING FUTURE GENERATIONS AN AFRICAN PERSPECTIVE



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Council for Geoscience



Outline

1. Minerals: blessing and curse
2. African Mining Vision
3. Current initiatives to build capacity
4. Challenges and opportunities



Production & known resources

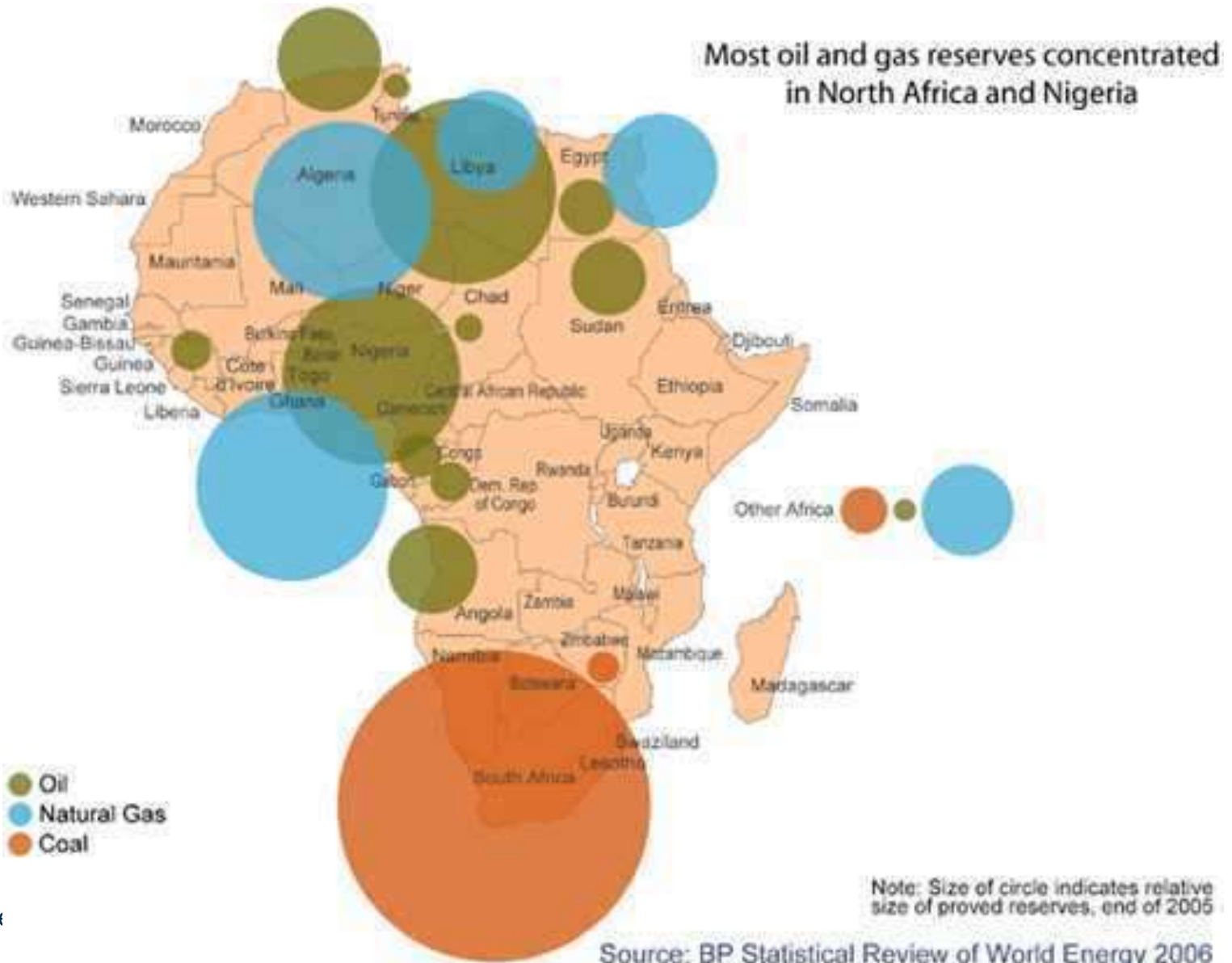
(2004 Figures; Vast areas remain un-explored)

Mineral	Production	Rank	Reserves	Rank
PGMs*	54%	1	60+%	1
Phosphate	27%	1	66%	1
Gold	20%	1	42%	1
Chromium	40%	1	44%	1
Manganese	28%	2	82%	1
Vanadium	51%	1	95%	1
Cobalt	18%	1	55+%	1
Diamonds	78%	1	88%	1
Aluminium	4%	7	45%	1

Also Ti (20%), U (20%), Fe (17%), Cu (13%), etc.
*PGMs: Platinum Group Minerals



Production & known reserves





Minerals: blessing & curse





Minerals: blessing & curse





Minerals: blessing & curse



<http://ecologyrank.com/oil-thefts-threaten-nigerias-economy-environment.html>



Minerals: blessings and curses



<http://www.flickr.com/photos/pactworld/3675567872/>

Slic



Water: the basis of life



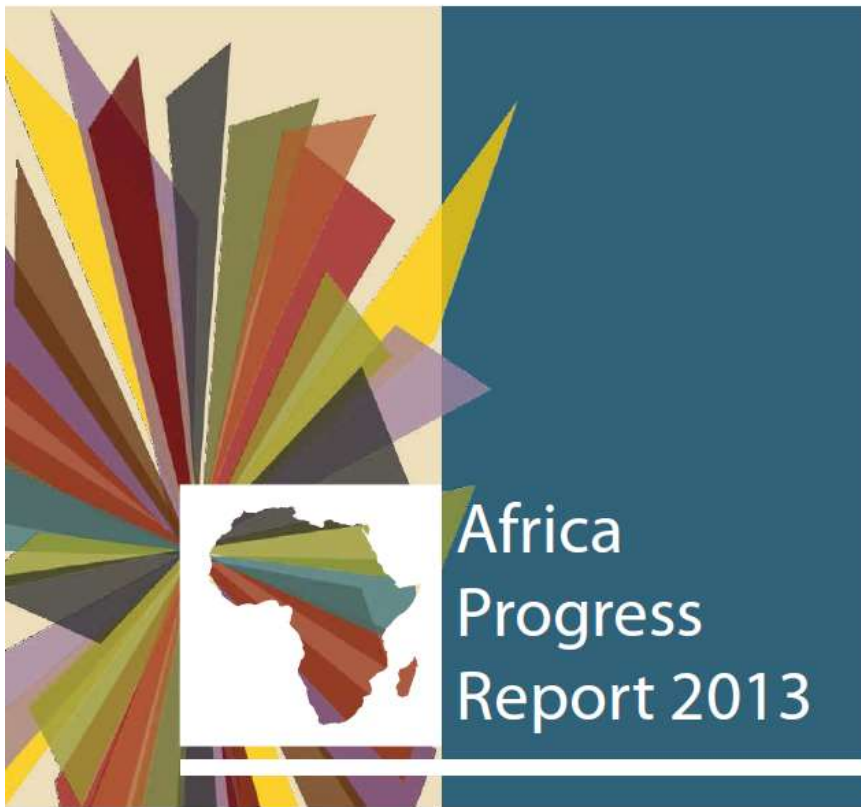


Minerals: blessing & curse

AFRICA
PROGRESS PANEL

Equity in Extractives

Stewarding Africa's natural resources for all



Kofi Annan



Michel Camdessus



Peter Eigen



Bob Geldof



Graça Machel



Strive Masiyiwa



Olusegun Obasanjo



Linah Mohohlo



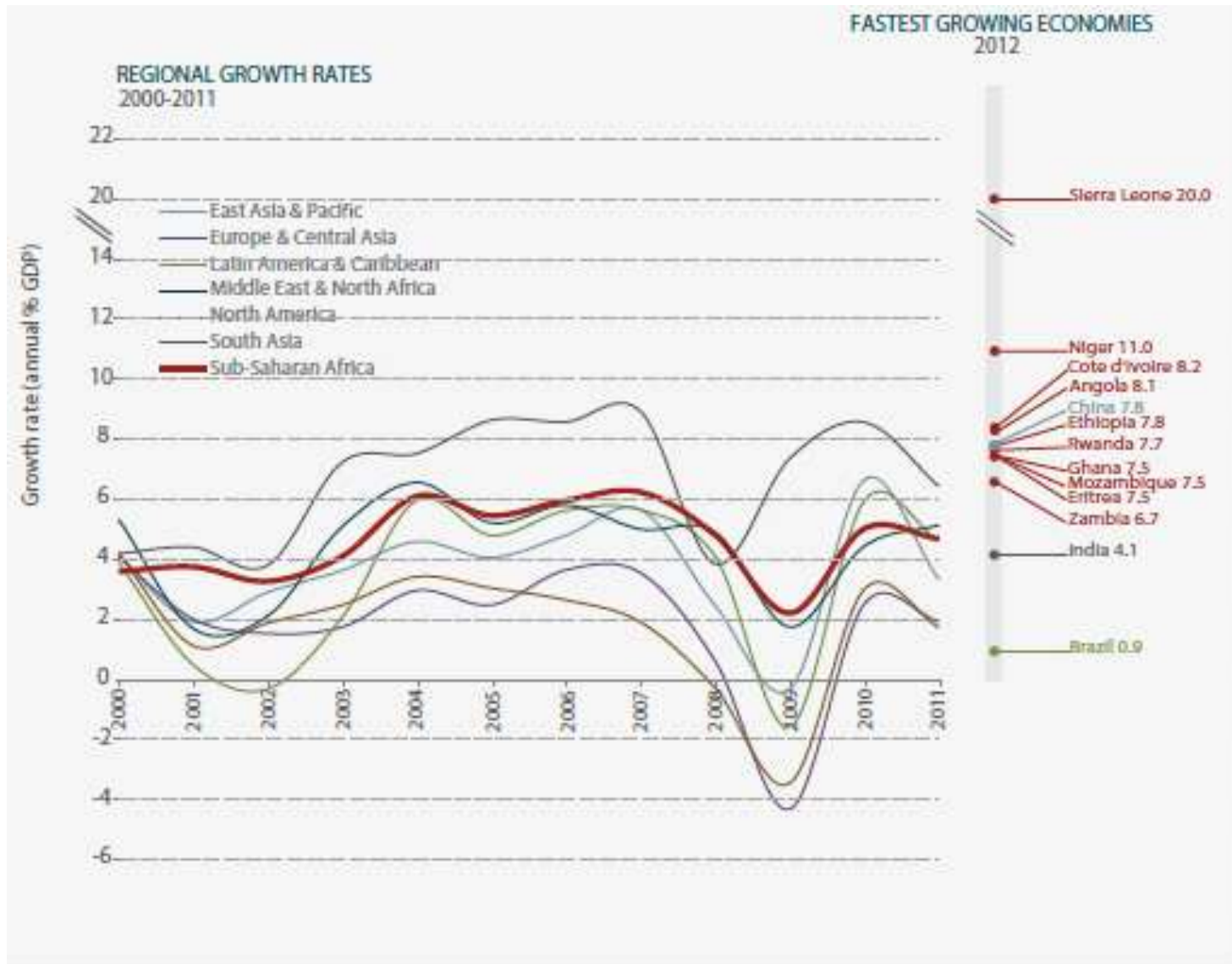
Robert Rubin



Tidjane Thiam



Minerals: blessing & curse

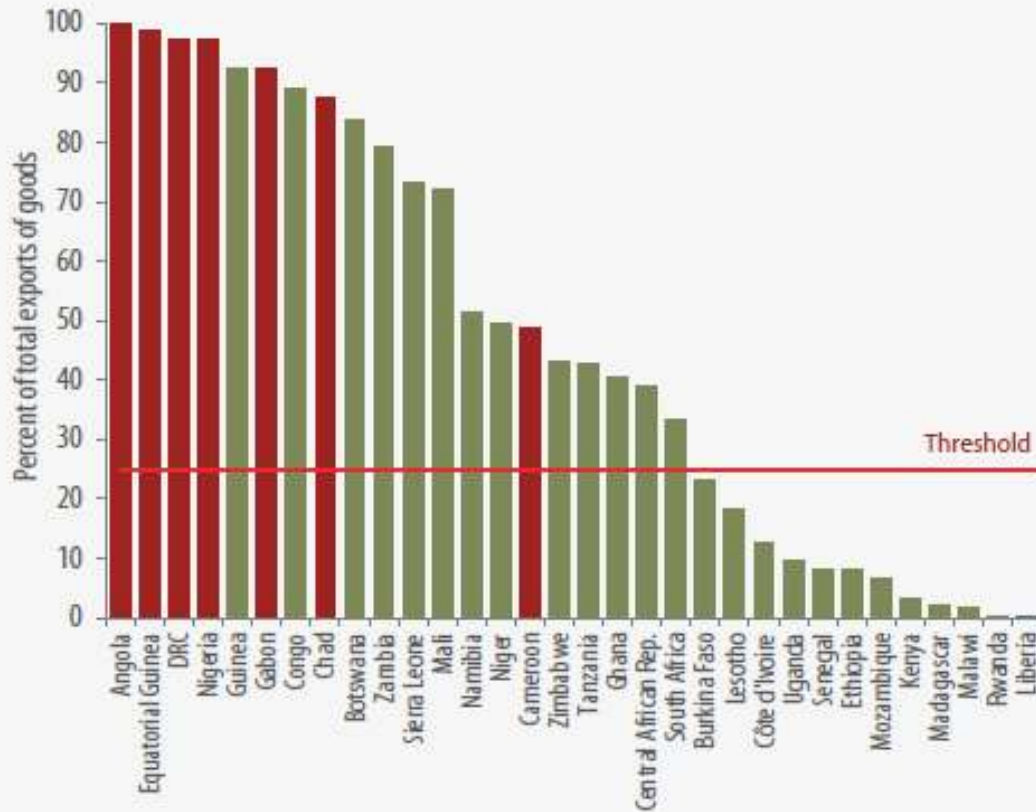




Minerals: blessing & curse

RESOURCE EXPORTS

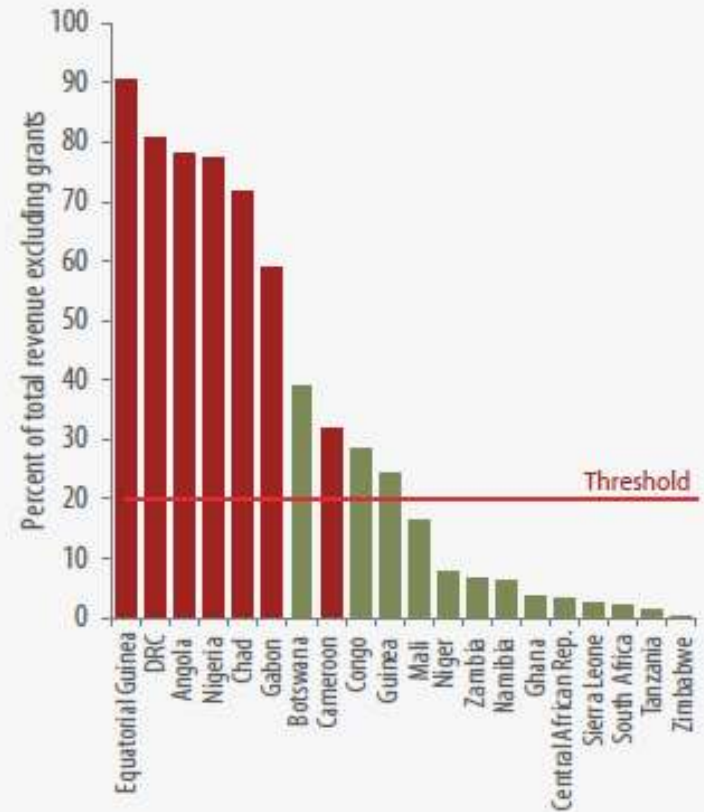
(Average 2005 – 2010)*



■ Oil exporters: Countries where net oil exports make up 30% or more of total exports

RESOURCE REVENUE

(Average 2005 – 2010)

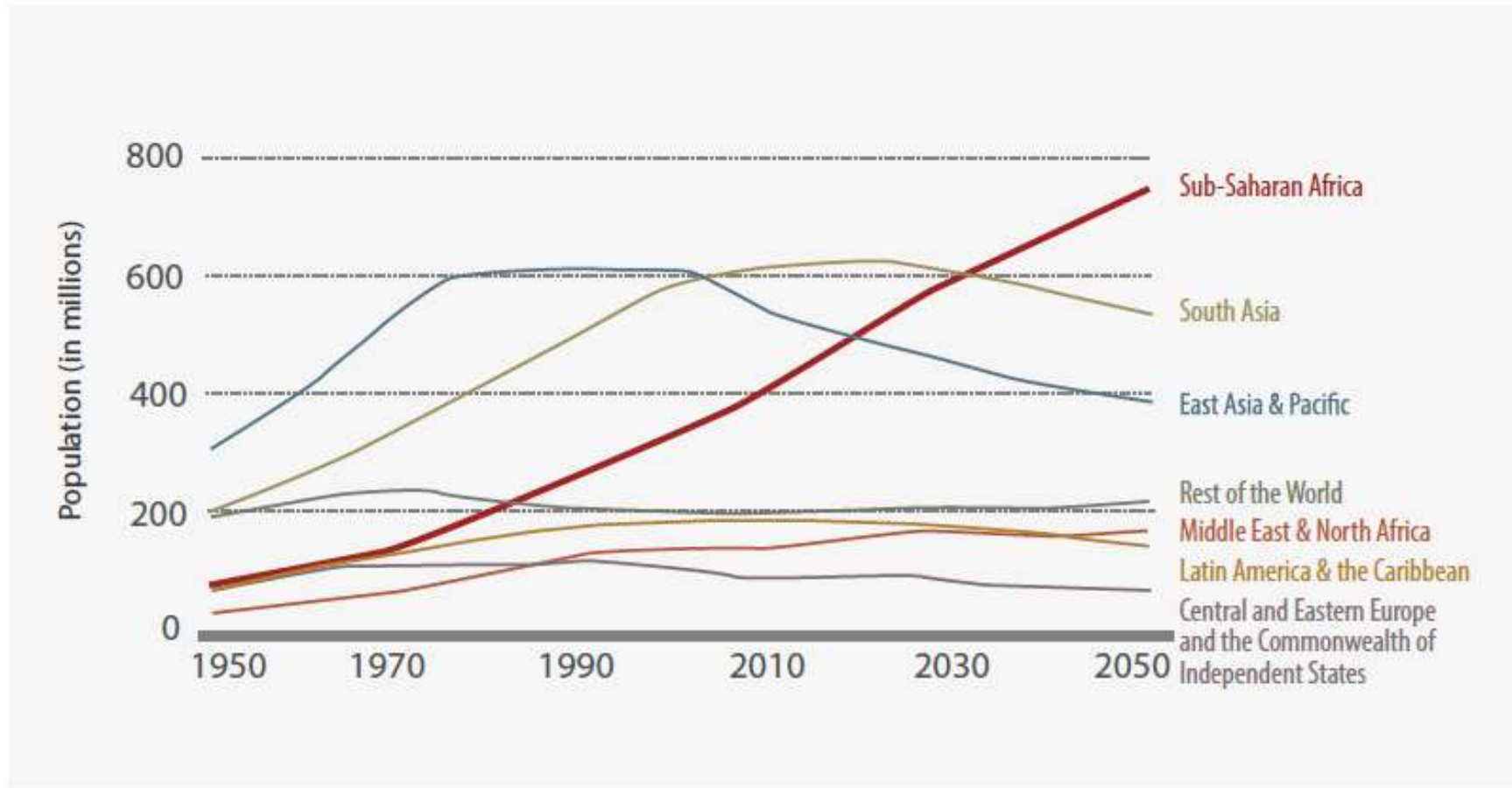


*Data for Côte d'Ivoire and Senegal exclude re-exports of refined oil products



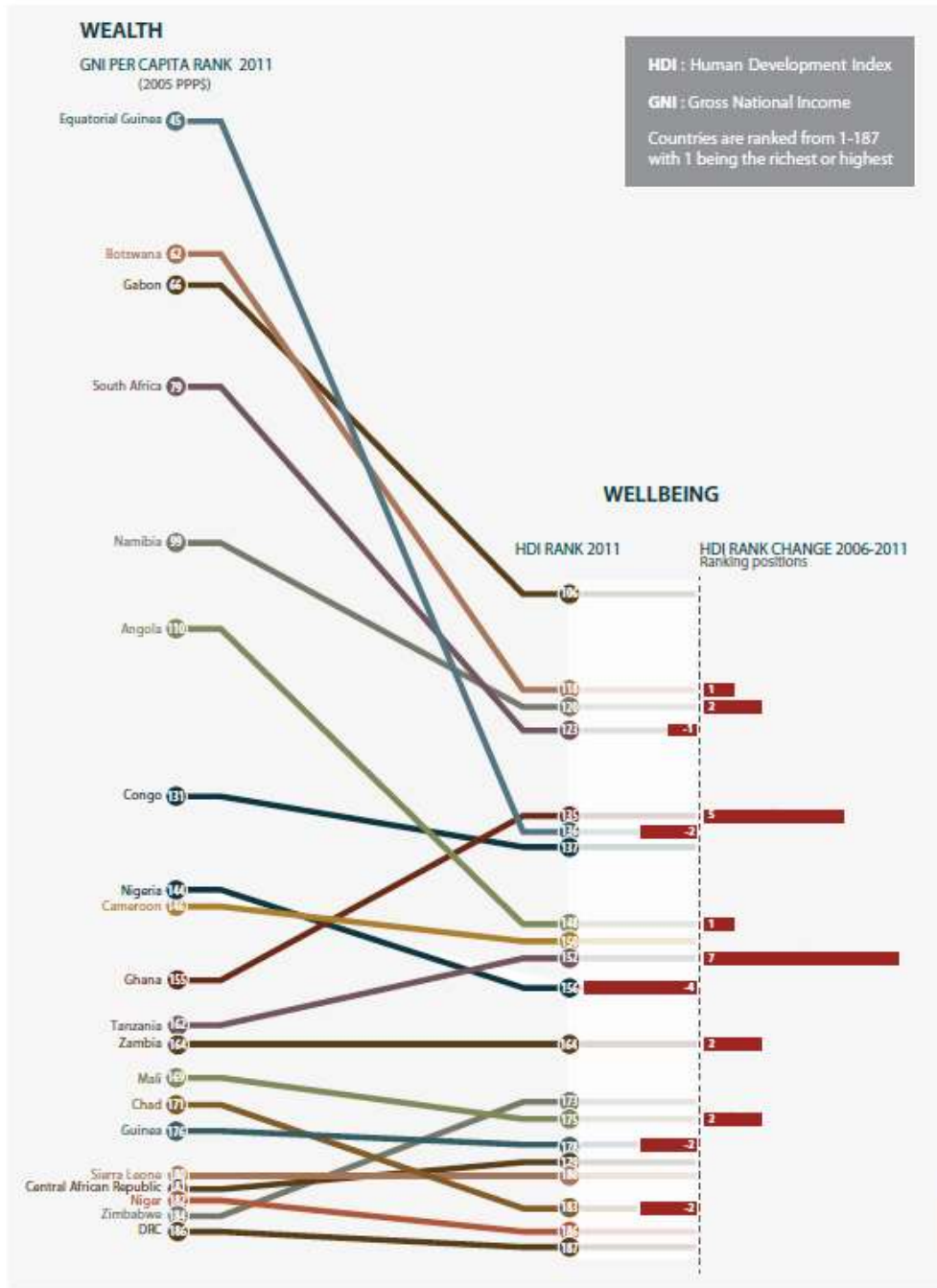
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Figure 6: NUMBER OF CHILDREN UNDER 18 BY UNICEF REGION



Minerals: blessing & curse

Figure 7: WEALTH/WELLBEING GAP



Source: UNDP (2011), Human Development Report.

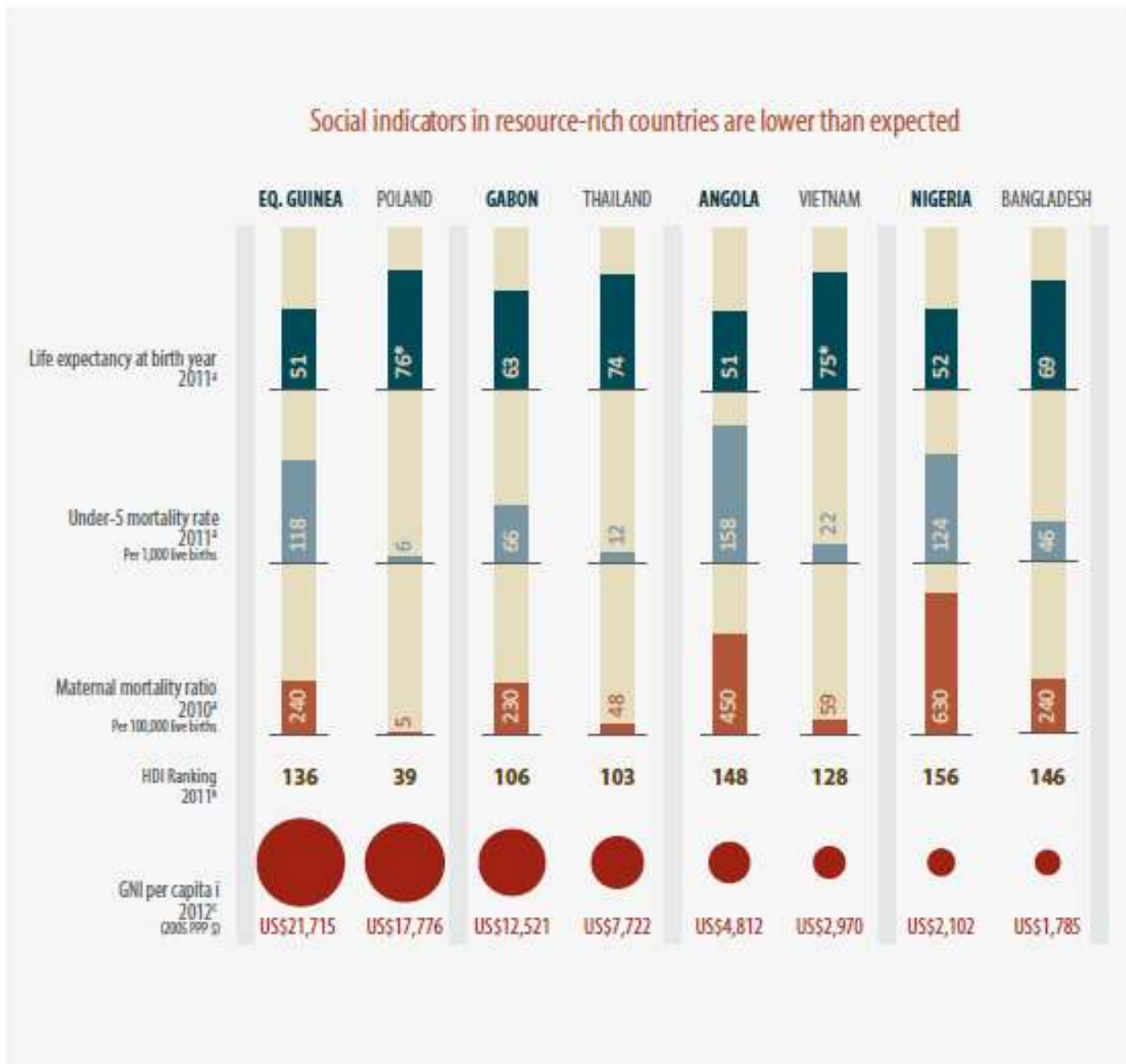


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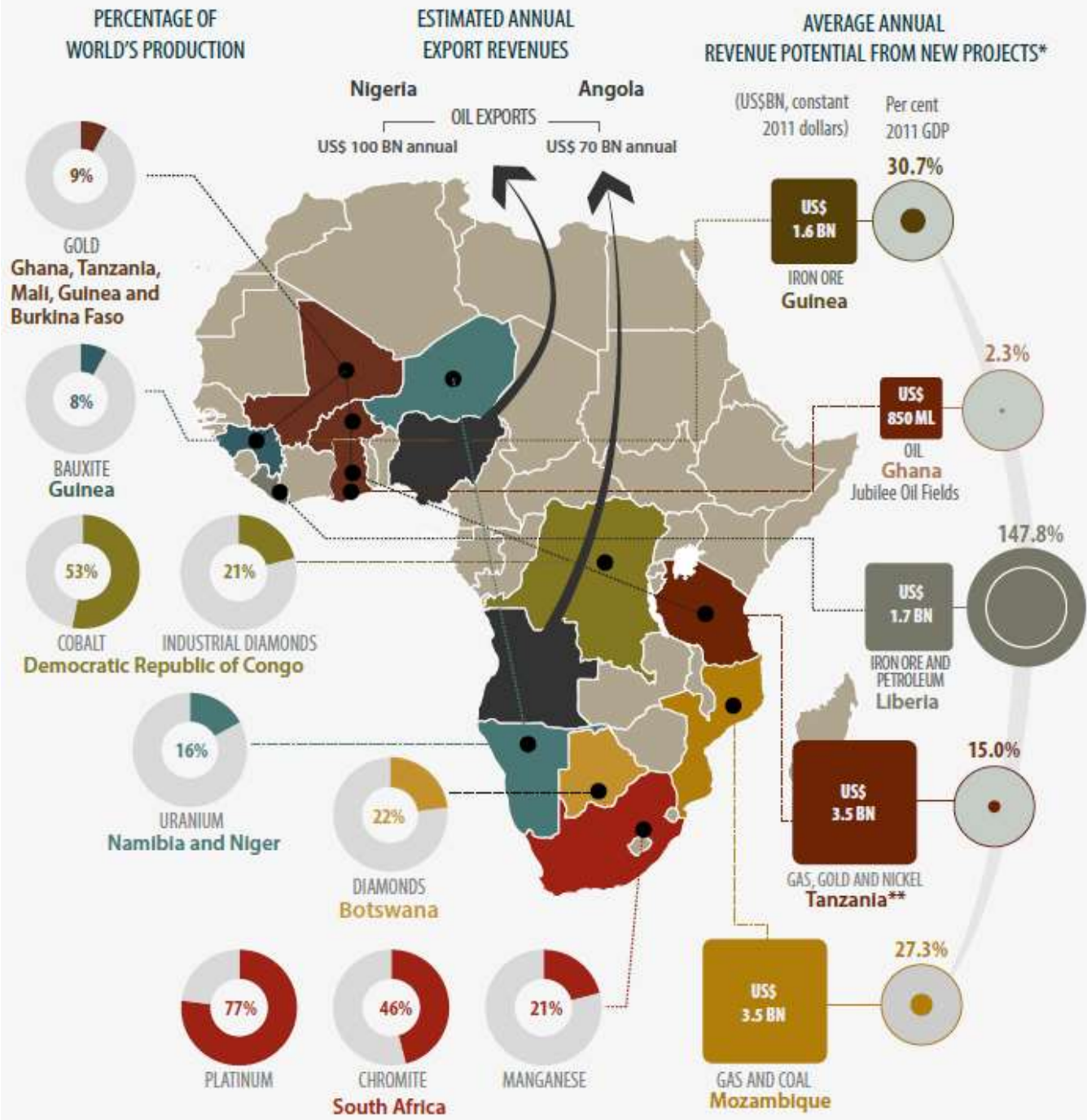
Figure 9: LEFT BEHIND IN HUMAN DEVELOPMENT



Minerals: blessing & curse



6



Sources:
 Raw Materials Data, Initierra/IMG, 2013
 World Bank, Africa Pulse October 2012, Volume 6
 IMF, Fiscal Regimes for Extractive Industries: Design and Implementation, 2012
 U.S. Geological Survey, Mineral commodity summaries 2013
 *Estimates are intended to show order of magnitude. Revenue projections are highly sensitive to assumptions about prices, phasing of production, and underlying production and capital costs
 **Data represents annual revenue at peak production



Africa Mining Vision

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About AMV

The Africa Mining Vision is a pathway, formulated by African nations themselves, that puts the continent's long term and broad development objectives at the heart of all policy making concerned with mineral extraction. The AMV sets out how mining can be used to drive continental development. [>>>](#)

Action Plan

At the December 2011, 2nd AU Conference of Ministers Responsible for Mineral Responsible Development a concrete Action Plan was agreed. This provides the roadmap for implementing the Africa Mining Vision in the future. Under the Action Plan, the pillars of the Vision will be implemented through nine programme clusters.

ISG Report

The *International Study Group Report on Africa's Mineral Regimes: **Minerals and Africa's Development*** supports the Africa Mining Vision. Published to coincide with December's meeting of mining ministers, it will help inform policy decisions for the future. It is a key reference for guiding the implementation of the AMV

Reports

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African Mining Vision



Minerals and Africa's Development

The International Study Group Report on
Africa's Mineral Regimes



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Economic Commission for Africa

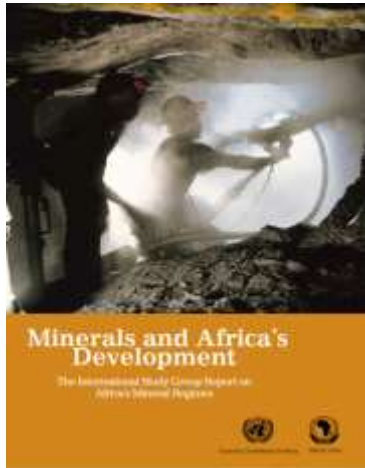


African Union

Published in
November 2011



African Mining Vision



210 pages

1. Introduction
2. Africa's minerals: history and search for direction
3. Global trends
4. Mining in Africa: managing the impacts
5. Artisanal and small-scale mining in Africa
6. Corporate social responsibility initiatives
7. Capture, management and sharing of mineral revenue
8. Optimizing mineral-based linkages
9. International trade and investment
10. Mineral management: the power of institutions
11. Regional and sub-regional strategies in mineral policy harmonization
12. Looking ahead: key challenges and policy messages

AMV Action Plan



African Union
Commission



African Development
Bank



United Nations
Economic Commission
for Africa

Building a sustainable future for Africa's extractive industry: From vision to action

ACTION PLAN FOR IMPLEMENTING THE AMV

December 2011



AMV Action Plan: tenets

- Optimizing the knowledge and benefits of finite mineral resources
- Harnessing the potential of small-scale mining
- Fostering environmentally and socially responsible mining
- Building human and institutional capacity
- Developing a globally competitive African mineral industry
- Fostering a transparent and accountable mineral sector in which resource rents promote broad economic and social development
- Promoting good governance in which there is equity in the distribution of benefits



AMV Action Plan: clusters

1. Mining revenues and mineral rents management
2. Geological and mining information systems
3. Building human and institutional capacities
4. Artisanal and small scale mining
5. Mineral sector governance
6. Research and development
7. Environmental and social issues
8. Linkages and diversification
9. Mobilising mining and infrastructure investment



African Minerals Development Centre



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AFRICAN MINERALS DEVELOPMENT CENTRE

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African Minerals Development Centre

If well managed, Africa's mineral endowments can lift the continent out of poverty and catapult it to growth, development and prosperity for all – this is the ultimate purpose of the African Mining Vision, adopted by the African Union Assembly of Heads of State and Government.

About AMDC

Africa is well endowed with mineral resources and has a long history of mining, but has so far not reaped the developmental benefits from these resources. This is largely due to the weak integration of Africa's mining sector into national economic and social activities.

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Capacity-building initiatives



Organisation of African Geological Surveys

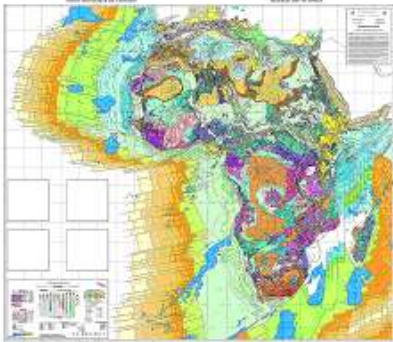
Organisation de Services Géologiques Africains

Organizaçao de Serviços Geológicos Africanos

|||||

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The OAGS consists of representatives from African countries including Algeria, Kenya, Ghana, Chad, Zambia, Tanzania, South Africa, Sierra Leone, Nigeria, Mozambique, Mali, Zimbabwe, Angola, and Uganda. South Africa was elected Secretariat of the organisation and Algeria is the current President of the OAGS.

Its mandate is to foster and sustain government-supported geosciences endeavours and excellence on the African continent, in the quest for socio-economic development and poverty alleviation, with special reference to mineral resource assessment, sustainable land use and development, hazard mitigation and environmental protection.

The specific aims of the organisation include, but are not limited to, creating regional- and continent-wide promotional maps and documents that inform decision-makers in government and industry on matters relating to the applied geosciences.

current projects of the oags

Select from the list below for more information:

[Seismotectonic Map of Africa](#)

[Role of Geological Surveys in Africa](#)

[Role of Geological Surveys in Small-Scale Mining](#)

[African Geosites](#)

[African Input into the Geological Map of the World](#)



Capacity-building initiatives



GEOLOGICAL SOCIETY OF AFRICA (GSAf) — SOCIÉTÉ GÉOLOGIQUE D'AFRIQUE

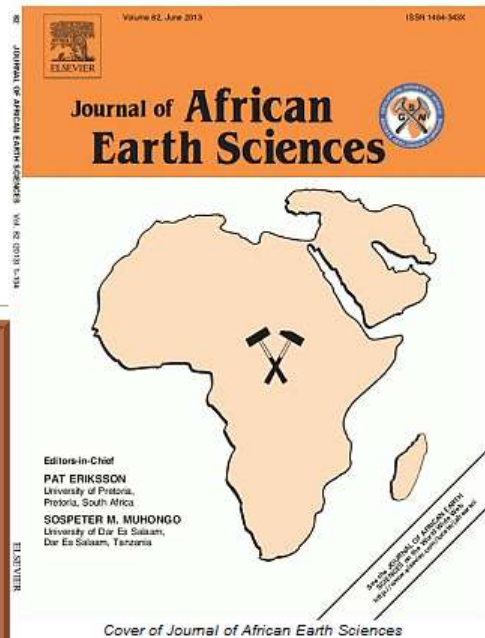
The Geological Society of Africa (GSAf) was established in 1973 to encourage geoscientific collaboration and cooperation across the continent.

Its main objectives are:

- to promote understanding of the earth sciences and improve standards of earth science education and research in Africa;
- to provide a forum for discussion and dissemination of information across national boundaries between scientists, associations and institutions engaged in African geology and earth resources;
- to promote the development and sustainable management of the continent's earth resources, to advance its socio-economic development; and
- to improve natural hazards assessment and disaster mitigation.

The Journal of African Earth Sciences (JAES) is closely affiliated with the Geological Society of Africa (GSAf). The society will use its best efforts to promote the journal to its members and to the relevant scientific discipline, and will endeavour to stimulate the submission of papers of the highest professional standard. The Society shall make clear to members that members subscription (79 USD for 2013) will be for personal use only and may not be placed in institutional or university libraries. In our Memorandum of Agreement with Elsevier we have agreed that Elsevier will provide an annual prize of \$500 USD for the best paper published by an African Researcher in the Journal from the preceding calendar year. The recipient of the prize will be chosen by the Editors of the journal. So, we encourage African Researchers to submit their research results for publication in JAES. The GSAf is planning to establish a publications committee among its members to support African Earth Scientists in their effort to prepare manuscripts of international standard.

Prof. Aberra Mogessie





Capacity-building initiatives

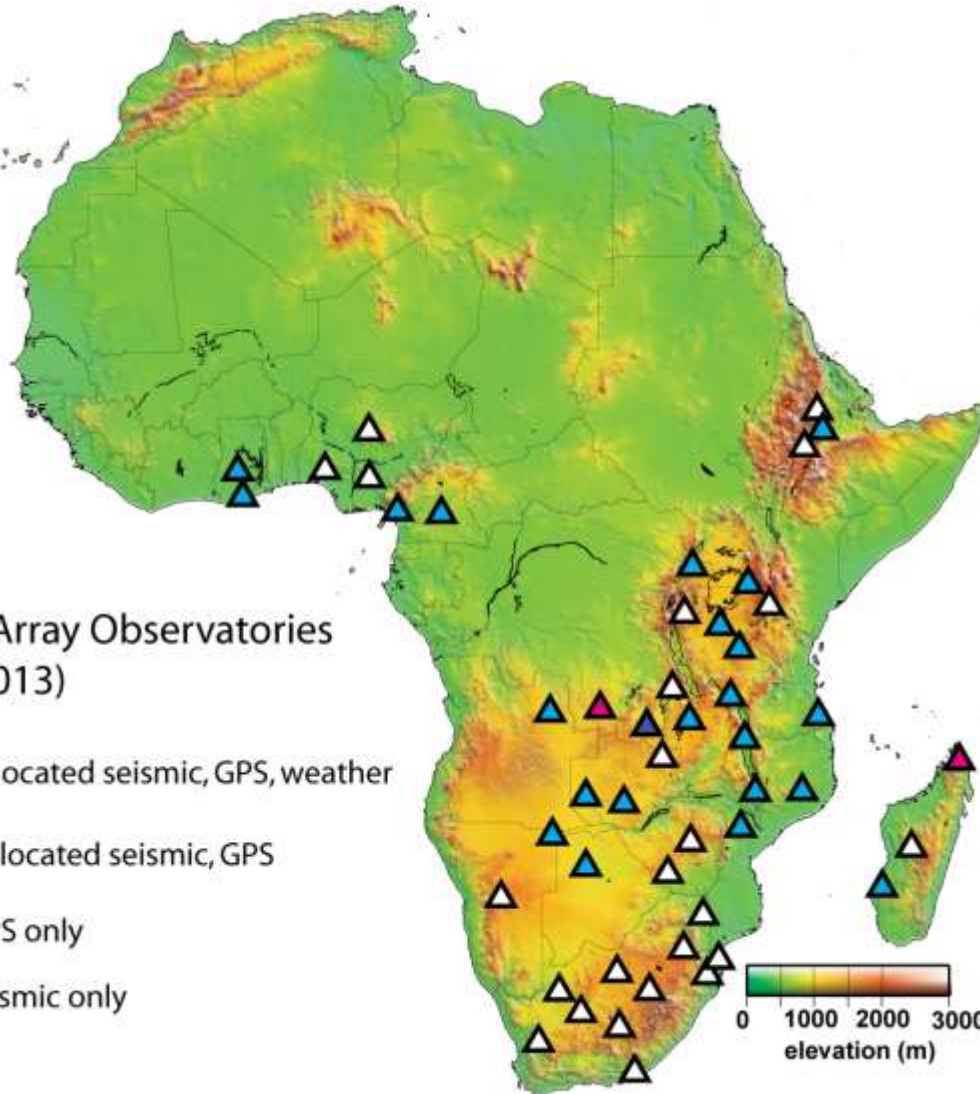


Observatory Network

- 51 stations
- 48 seismic stations
- 27 GPS/met stations
- 19 countries
- Continuous recording
- Data recovery 70-80%
- Data availability: IRIS and UNAVCO
- Data retrieval:
 - A few countries - real-time using cell modems
 - Elsewhere - monthly

AfricaArray Observatories
(Jan 2013)

- ▲ collocated seismic, GPS, weather
- ▲ collocated seismic, GPS
- ▲ GPS only
- ▲ seismic only





Capacity-building initiatives



INTERNATIONAL FIELD SCHOOL



2012 Field School – Open pit project



Capacity-building initiatives



WAXI - West African Exploration Initiative

IXOA - L'Initiative d'Exploration Ouest Africaine

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The WAXI 3 Project proposal is now available. Please contact joe.cucuzza@amirainternational.com or mark.jessell@ird.fr for further information.

Welcome

The West African Exploration Initiative (WAXI) is an ambitious research and training program led by nine [partner](#) institutions, focussed on the mineral potential of the Leo-Man Craton. This Initiative, which commenced in November 2006, is principally funded by the international [Mining Industry and the Australian Government \(AusAID & ARC\)](#), via an AMIRA International consortium. [AMIRA International](#) is an industry association dedicated to supporting collaborative minerals industry research.

The overall aim of West Africa Exploration Initiative is to enhance the exploration potential of the Leo-Man Shield through an integrated program of research and data gathering into its 'anatomy', and to augment the capacity of local institutions to undertake this form of work. The capacity building activities are completely underwritten by [AusAID](#) (the Australian Agency for International Development). The

Bienvenue

L'Initiative de l'eXploration Ouest Africaine (WAXI-IXOA) est un programme de recherche et de formation ambitieux mené par neuf instituts partenaires, qui met l'accent sur le potentiel minéral du craton Léo-Man. Cette initiative, qui a débuté en Novembre 2006, est principalement financée par l'industrie minière internationale et par AusAID, via un consortium international, AMIRA. AMIRA International est une association industrielle dédiée au soutien de la recherche collaborative industrielle des minéraux.

L'objectif global de l'Initiative de l'eXploration Ouest Africaine est d'accroître le potentiel d'exploration du Bouclier Léo-Man à travers un programme intégré de recherche et de collecte de données, et d'augmenter la capacité des institutions locales à entreprendre ce type de travail. Les activités de renforcement des capacités sont totalement



Capacity-building initiatives

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ANESI Launch NEW

A Business Meeting to launch the African Network of Earth Sciences Institutions (ANESI) will take place on the Afternoon of 13th January 2013 at the Millenium Hall in Addis Ababa (Ethiopia) during the 24th Colloquium of African Geology (CAG24) from 8 January to 14 January 2013.

African Network of Earth Science Institutions

HOT NEWS

January, 2013

GIRAF Geoscience Information in Africa. 2nd Workshop. [GIRAF](#)

24TH COLLOQUIUM OF AFRICAN GEOLOGY

MEMBERSHIP

- ANESI Members are recruited from earth science department of African universities, earth sciences research institutions, African geological surveys and from earth science



Capacity-building initiatives



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Latest news

African Regional
Implementation Workshop on
Hazards and Disasters

African Regional Implementation Workshop on Hazards and Disasters

— tags: [Data and information](#), [Education](#), [Basic science](#), [Hazards and disasters](#)

An African Regional Implementation Workshop on Hazards and Disasters workshop was held at Dakar, Senegal from 26-27 September, 2012. The workshop was attended by leading hazards and disasters experts from the African and other regions of the globe. Representatives from regional hazards and disasters initiatives/organisations and some funding agencies were also in attendance.

This workshop focused on:

- Establishing research consortia that will design specific trans-disciplinary and trans-boundary projects to be implemented at regional level in collaboration with identified partners.
- Outlining a framework with envisaged work plans for the implementation of these projects, highlighting the key role players, time lines and milestones in the implementation.
- For each project, exploring and identify available funding/ fundraising opportunities from within and outside the region, including submission within the 10-year research proposal that will be compiled at the end of the 18-month Sida-funded period.

The workshop ended with a strong resolve from all participants to work towards addressing the problems of natural and human-induced

Online Community

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Challenges & Opportunities

- Harness IUGS network and resources to build African Earth Science capacity and institutions
- Be sensitive to cultural, economic and political differences
- Colleges and Universities – expand current initiatives
 - Undergraduate (e.g. training for lecturers, e-learning materials)
 - Post-graduate training (e.g. co-supervision)
 - Research infrastructure and collaboration (e.g. share expensive instruments, host Africans for sabbaticals, spend a sabbatical in Africa, meaningfully include Africans in research projects)



Challenges & Opportunities

- Support for life-time learning
 - Geological Surveys, Mining Ministries and Science Councils
 - Practitioners employed by mining industry, consultants
- Make African data stored in northern institutions available to African geoscientists
- Harmonize and expand African geo-data sets
- Develop models of ore bodies and ore-forming systems applicable to Africa
- Promote local beneficiation



Challenges & Opportunities

Optimising future Mineral Opportunities in Africa

3 Types of Mineral Terrains

**Unknown
Mineral Assets**

Exploration Terrain

Exploration Licences

Prospective Resource Rent

**Partially
Known**

Geo-Reserve Terrain

Further geo-survey

**Future exploration for future step-
in rights**

**Known
Mineral assets**

Delineation Terrain

**Rent share
Up/downstream investment
Infrastructure Development
HRD & R&D
Tech Transfer
Community Development**

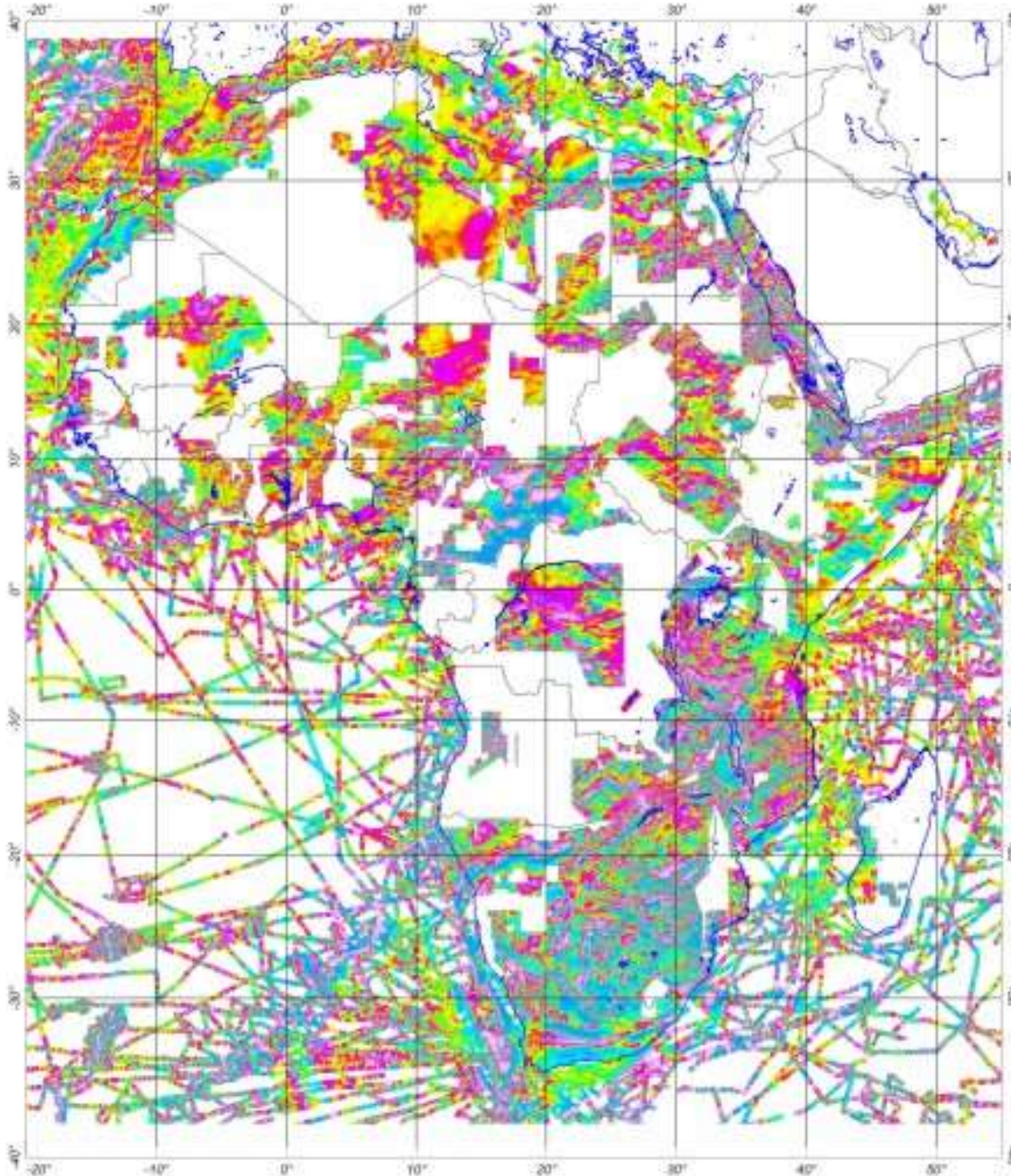


Challenges & Opportunities

Investment in Geo-knowledge

- Investment into infrastructure should not only focus on physical infrastructure, but also knowledge infrastructure
- Studies have indicated extremely high return to the state from investment in geo-survey (~1:10 investment to return ratio to the fiscus)
- The lower the geo-information base, the higher the risk, the lower the share of resource rents to the state
- This compromises the longer term sustainability of the investment

Challenges / Opportunities



Paterson, Grant & Watson Limited (PGW), in collaboration with GETECH and ITC, compiled all the available airborne and marine magnetic surveys for the continent of Africa.

Data

- The known surveys number approximately 800 individual datasets, acquired largely for hydrocarbon and mineral exploration interest.
- Coverage is approximately 80% of the land and continental shelf area.
- Survey data from 1948 to 1992 and cover all 52 African nations.

For further information contact:
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Toronto, Ontario
Canada, M5H 3B7



Challenges & Opportunities



Council for Geoscience



35th International Geological Congress
Cape Town, South Africa - 2016



****Room 201****
17:30
Promotional
Presentation