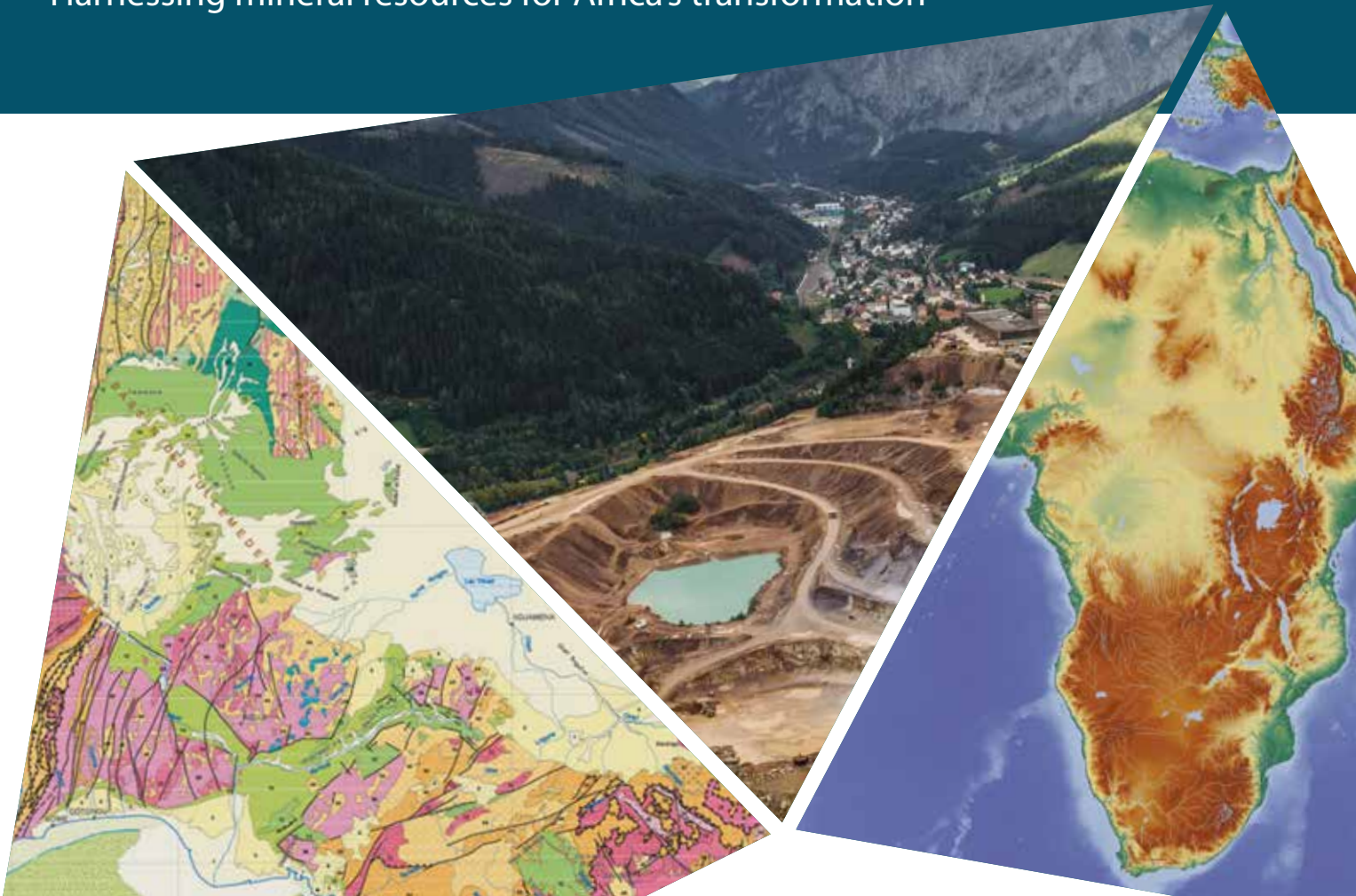




# African Minerals Development Centre: Geological and Mineral Information Systems

Harnessing mineral resources for Africa's transformation



# Africa Mining Vision (AMV)

“Transparent, equitable and optimal exploitation of mineral resources to underpin broad-based sustainable growth and socio-economic development.”

The AMV puts Africa’s long term and broad development objectives at the heart of all policy-making concerned with mineral extraction.

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## Milestones

2009	Africa Mining Vision (AMV) adopted by African Union (AU) Member States as the continental framework for the development of the minerals sector in Africa.
2011	AU Member States adopt a comprehensive AMV Action Plan.
2013	The African Minerals Development Centre (AMDC) established to accelerate AMV implementation across Africa.
2014 onwards	AMDC leads concerted and strategic efforts to put the AMV framework into operation through programme activities and studies with AU Member States, African regions, and key global initiatives.
2016	AMDC’s Geological and Mineral Information Systems (GMIS) Strategy approved by the AUC Specialized Technical Committee (Meeting of Ministers).

## The AMDC Vision

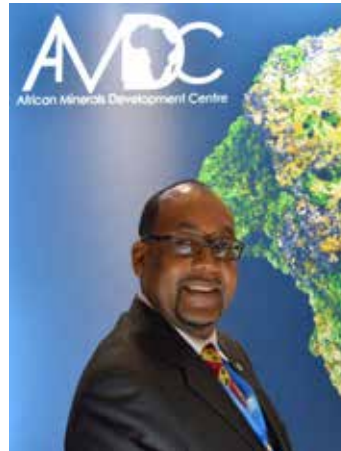
To become a Centre of Excellence and the facilitator of choice to enable AU Member States to realise the Africa Mining Vision.

## AMDC Mission

To work with AU Member States and their national and regional organisations, including the AUC, the NEPAD Planning and Coordinating Agency (NPCA), and Regional Economic Communities (RECs) to enable mineral resources to play a greater transformative role in the development of the continent through increased economic and social linkages, and in this manner, help address its intractable poverty and limited development.



# A message from AMDC's Coordinator



In 2009, the Africa Mining Vision (AMV) was adopted by African Heads of State and Government. The AMV offers a unique, pan-African pathway to finally reverse the old paradigm regarding the management of our mineral wealth. It seeks to use Africa's natural resources sector to transform the continent's social and economic development. AMDC is the lead institution that helps AU Member States to fast-track alignment of their mineral sector development to the Vision, to achieve better developmental outcomes.

The Vision is designed to support our governments in addressing the complex linkages that must be unlocked to make

mineral resources truly developmental. AMDC's seven workstreams reflect the priorities identified by African governments and work together to support African mineral economies to: develop consistent development-oriented mineral policies and regulatory frameworks; make effective use of geological and geospatial information for governance and developmental outcomes; diversify their economies by unlocking linkages; establish a knowledge-driven and well-governed African mineral sector that is socially and environmentally accountable, and contributes to broad-based growth and development; and build a viable and sustainable artisanal and small-scale mining sector to provide decent quality of life for rural communities.

The AMV represents a shift from geological information just for mining development to geological information which supports broad-based sustainable growth and socio-economic development. Here, we examine why effective use of geological and geospatial information is vital to achieving developmental outcomes, and the progress that AMDC has made in this area in just a few short years, championing new strategic approaches to improving geological understanding of the continent, whether below African earth, waters or oceans.

**Dr. Kojo Busia**  
*AMDC Coordinator*

## Action Plan for the Implementation of the AMV

GMIS

### RESULTS AREAS

- Improve exploration rates
- Upgrade mineral inventories
- Improve institutional capacities





## From Vision to action: the GMIS workstream

The goal of all AMV-compliant geological initiatives and activities is to improve geological and geospatial information and its use in mining and broad development processes in Africa.

The AMV stresses that geological information is a vital, integrated element of Country Mining Visions (CMVs) (*see page 10*). Geological data is essential not just for mining, but for many economic sectors including infrastructure and agriculture. Robust data allows both public and private sectors to make informed decisions on mineral sector development. The more accessible the data, the lower the investment risks for exploration or mine development. Geological data collected on a regular basis throughout Africa can significantly enhance the sector's potential and increase commercial exploration and investment.

! African governments are foregoing **billions of dollars yearly** in revenues due to lack of high quality and up-to-date geodata, which is key to negotiating optimal contracts, leveraging inward investment, and effective governance of the mineral sector.

Currently, Africa lacks sufficient geological map coverage; its publicly-funded Geological Survey Organisations (GSOs) and Departments are underfunded and poorly resourced; and geological information is often not factored into government decision-making. This puts countries at a disadvantage in planning for sustainable land and marine use, developing strategies for minerals exploitation, developing infrastructure, and in contract negotiations.

AMDC is co-ordinating efforts to improve access to geological and mineral information (GMI) and integrate it into government decision-making. The GMIS workstream has collaborated with regional partners to develop the GMIS Strategy, designed to strengthen vital information resources (*see page 8*). The team offers strategic operational support for AU Member States, RECs, and GSOs; aligns and facilitates activities from different African GMIS initiatives; and identifies skills gaps and promotes capacity building. The workstream addresses ways to finance the production, management and dissemination of GMI, and assists AU Member States to grow its national geo-databases (for example, via the transfer of corporate geo-data. AMDC is also helping African governments to plan for sustainable development of its aquatic and marine resources, known as Africa's 'Blue Economy' (*see page 11*).

## The expected outcomes of the GMIS workstream are:

- Improved decision-making capabilities to manage the mining sector, as well as other sectors requiring geospatial information
- Improved national and sub-regional capacity to manage geological and geospatial information for broader development objectives and as a tool for investment, governance and transparency
- Strengthened sustainable development of Africa's 'Blue Economy', to support structural transformation, sustainable economic growth, and societal progress.

**AMV goal:** "Improved geological and mining information systems to underpin investment in exploration and mine development."

AMV Action Plan, 2013

## Benefits of using GMIS

Effective use of GMIS offers many important legal, economic, social and environmental benefits. Governments can use improved GMIS to:

- Inform development and application of mining policies, regulations and fiscal regimes
- Improve decision-making and management of mineral resources and mining sector activities
- Better assess the potential of mining projects and design the best possible tenders, taking the real value of mineral resources into account
- Facilitate accurate pricing and decision-making in contract negotiations
- Provide better options for concession of exploration and mining permits
- Establish judicious taxation rates and ensure a fair share of mineral-related revenues
- Establish the potential of lower-value, often disregarded, industrial and agro-minerals
- Enable better assessment of environmental impact and sustainability of mining projects and activities
- Monitor licenses of contracts and track mineral projects and activities.



## AMDC Partners

### Strategic Partners

The African Union Commission (AUC), African Development Bank (AfDB), United Nations Development Programme (UNDP), United Nations Economic Commission for Africa (UNECA), and NEPAD.

### GMIS Implementing Partners

African Union Commission; International Mining for Development Centre, Australia; African Minerals and Geosciences Centre, Tanzania; Geological Survey of Brazil, Brazil; Geoscience Information in Africa Network (GIRAF), Tanzania; Geological Survey of Namibia, Namibia; Geological Society of Africa (GSAf); European Geological Surveys (EGS-PanAfGeo); Organization of African Geological Surveys (OAGS); African Association of Women in Geosciences (AAWG); African Minerals Geoscience Initiative (AMGI); African Network of Earth Science Institutions (ANESI/UNESCO).

### AMDC observer status

International Seabed Authority (*see page 11*).

### Funding Partners



# GMIS and the Sustainable Development Goals (SDGs)

Ultimately, the GMIS Strategy is expected to enable African countries to exercise governance over their mineral wealth, and use their mineral resources for the benefit of all their citizens. The Vision and the SDGs provide a mutually-reinforcing framework for mineral-led development in Africa.

On 25 September 2015, spearheaded by the United Nations, countries adopted a set of seventeen Sustainable Development Goals, setting a fifteen-year agenda that aims to end poverty, protect the planet, and ensure prosperity for all. Adopted in 2009, the AMV has inspired Africa's position in the design and adoption of the SDGs. The AMV has therefore proved to be ahead of its time. The strong linkages between the AMV pillars and the SDGs are evident.

Preceding the global SDGs by more than six years, the AMV departed from the conventional wisdom on minerals to focus

on broad-based development. The overriding goal of the AMV is a sustainable and well-governed mineral sector that effectively garners and deploys resource rents and is safe, healthy, gender-and ethnically-inclusive, environmentally-friendly, socially responsible and appreciated by surrounding communities., and provide a mutually-reinforcing framework for structurally transformed mineral-led development for the continent.

The GMIS workstream has an important contribution to make to the achievement of a number of SDGs, most importantly:



- Capacity development for geologists and related disciplines
- African Network of Earth Science Institutions
- African Association of Women in Geosciences
- Geo-heritage



- Underground water resources, and planning for their use and management



- Harnessing new geo-technologies
- Planning and performing infrastructure works



- Deep sea mining
- Offshore mining
- Risk mitigation
- Deep seabed environment



## GMIS: How we are making a difference

AMDC collaborates with a wide range of stakeholders at all levels to unlock the transformative power of Africa's mineral resources and promote broad-based development. The GMIS team is working on initiatives at national, regional and global levels to support and advocate for the use of geological information to achieve developmental outcomes. The AMDC also promotes GMIS as a tool for governance.

### The GMIS Strategy - Promoting geological knowledge as a tool for investment, governance and transparency: a pan-African collaboration

AMDC has collaborated with a wide range of partners to develop the GMIS Strategy, which is the first strategy to be inspired by the AMV. It aims to strengthen AU member States' capacity to produce, manage and disseminate the geological and mineral information that is so crucial for legal, economic, social and environmental applications in mining and development processes in Africa.

The GMIS Strategy also helps to alert countries developing CMVs (*see page 10*) to areas of special interest such as the





! Africa's share of the global exploration budget, mainly from mining companies, remains the lowest in absolute terms – **less than US\$5 per square kilometre**, compared to **US\$65 for Canada** (AfDB, 2012).

African Blue Economy (*page 11*), artisanal and small-scale mining, underground water resources, geological hazards, infrastructure works, geo-heritage, geo-tourism, sustainable urban development, identification of areas with potential for agro-minerals and agriculture, environmental impact assessments, and waste management and disposal.

The Strategy is designed to be implemented at national, regional and continental levels. It addresses key issues identified in the CMV Guidebook (*see page 14*) and other analysis, including the lack of geological map coverage and poorly-resourced GSOs. It provides strategic operational support and diagnostic tools for AU Member States, their GSOs, and regional stakeholders. It identifies how AMDC, the AUC, and other institutions (e.g. RECs) and initiatives can best support African GSOs and centres of excellence to produce, manage and disseminate GMI to achieve important developmental benefits.

Development of the GMIS Strategy has been strongly collaborative, involving AMDC, the AUC, OAGS, GSAf, AAWG, and experts drawn from institutions around the world, including Australia, Brazil, Ethiopia, Germany, Namibia, and Tanzania. It is the first time that so many national, regional, continental and global stakeholders in geological information have come together to produce a pan-African strategy. This approach is also enshrined in the Strategy's Functional Structure, which is designed to ensure a high degree of pan-African collaboration through membership of the GMIS Strategy Coordination Committee. The GMIS Strategy was approved by the AUC Specialized Technical Committee (Meeting of Ministers) on 24 May 2016. AMDC is moving forward on a range of initiatives to support implementation of the Strategy. The GMIS strategy is free to download from AMDC's website (*see page 14*).

## GMIS Strategy application Tanzania and region

In December 2015, a team of GMIS experts from AMDC and the AUC conducted an assessment of the African Minerals and Geosciences Centre (AMGC), Dar es Salaam, Tanzania, to evaluate its existing capacity to act as a regional and continental Centre of Excellence for AMDC's GMIS, the Africa Minerals and Geoscience Initiative (AMGI), and other minerals development initiatives relating to the AMV. The AMDC/AUC team recognised the AMGC as a core Centre of Excellence, believing that it can play a vital role in the implementation of the Vision. The team recommended that AMGC is capable of taking responsibility for implementation of the GMIS Strategy, and that capacity building support be provided to improve the AMGC's infrastructure and human resources to enable it to host the GMIS central database.

## GMIS Strategy application Nigeria and region

In June 2016, AMDC's GMIS team conducted an assessment of the Nigerian Geological Survey Agency (NGSA), to identify its capability to act as a regional Centre of Excellence for GMI. The assessment made recommendations on how the AMDC/ UNECA/AUC could support the activities of the NGSA in restructuring the Nigerian mineral sector, using CMV Guidelines.

## The GMIS Strategy and Country Mining Visions (CMVs)

The CMV Guidebook (*see page 14*) identifies a goal of the AMV as being: *"improved geological and mining information systems to underpin investment in exploration and mine development"*. The CMV stresses the benefits to governments of a comprehensive geological and mineral information database. It emphasises the importance of a properly resourced Geological Survey institution for the state's knowledge of its mineral endowment, discovering new resources, developing minerals tenders, monitoring private exploration licenses / leases and as the marketing window for a country's minerals resources potential.

Using a participatory process, AMDC supports AU Member States by facilitating the development of CMVs to set out the expectations of government, business, communities and civil society around minerals, their extraction and use, and the benefits society and development. The GMIS Strategy contributes to this with evaluations of national GMIS capacity, background and feasibility studies; capacity building of national GSOs, and strengthening of centres of excellence. These activities aim to:

- Identify gaps and areas of need in the Member States' capability/potential to use GMIS in mining and broad development processes, and access expertise and information resources from local and international partners
- Identify support mechanisms both to finance the production, management and dissemination of GMIS by African GSOs, and to facilitate training and capacity building of GSOs to do so
- Support Member States in generating and applying geological information for informed policy and decision-making across the mineral value chain.



## AMDC's desktop review of African geological survey organisations

The GMIS workstream has conducted a survey on African GSOs' capacities and gaps. The gap analysis demonstrates that:

- Many countries with existing minerals industries risk their sustainability due to a lack of public geological information
- Countries with the potential for minerals development may also be postponing new artisanal and industrial scale minerals development for the same reason
- Across Africa there is a series of potential co-benefits that might also be realised if sufficient geological information was available: for example, there is significant geothermal energy potential along the Rift Valley in East Africa
- There are also different data needs for different types of minerals (e.g. various ore minerals, industrial minerals, agro-minerals, gems and semi-precious stones).

Given the potential development benefits that can come from improving geological information, both for minerals and as a co-benefit for energy, hydrology, and hazards, AMDC will develop a GMIS strategic approach to work with GSOs and other partners to maximise the potential benefits of geological data.

## The GMIS Strategy under the sea: Leveraging Africa's 'Blue Economy'

Maritime zones under Africa's jurisdiction total around 13 million square kilometres. National jurisdiction over the seabed normally ends at 200 nautical miles (370 km) out from baselines running along the shore. Meanwhile, the high seas and beyond the continental shelf (termed 'the Area') are under the jurisdiction of the International Seabed Authority for the 'common heritage of mankind'.

AMDC aims to improve understanding of the potential for the prospecting, exploration and exploitation of Africa's 'Blue Economy', or marine mineral resources, for the benefit of all Africa's citizens. Since even land-locked countries may apply for exploration rights to 'the Area', all African countries have the potential to benefit from the Blue Economy and related access rights to exploration and mining development.

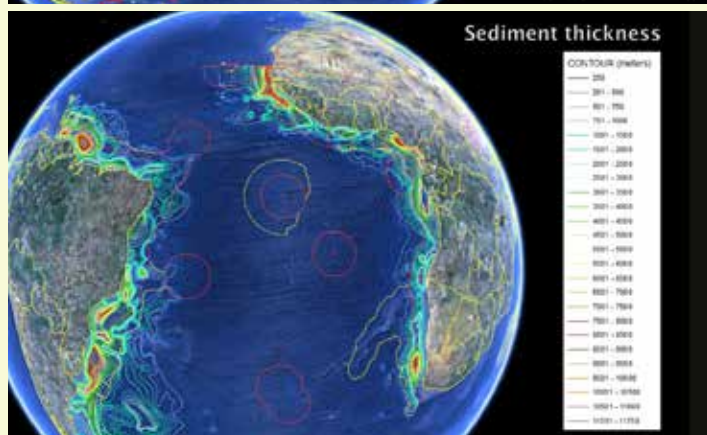
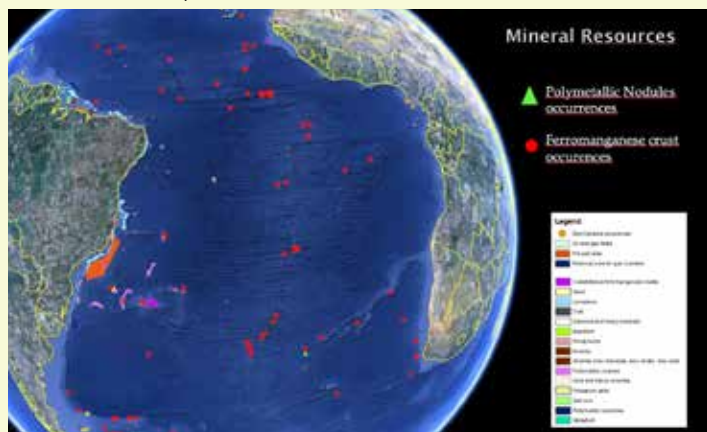
AMDC works to increase the mapping and geological surveying activities in the African continental shelf and adjacent oceanic areas. Activities include the development of *Africa's Blue Economy: A Policy Handbook* (see page 14), a guide to factor aquatic and marine resource planning into national development plans, strategies, policies and laws. The Centre is also supporting the development of a mineral inventory program for the African continental shelf and adjacent oceanic areas.

AMDC also works to developing international cooperation for activities in the international seabed areas. In 2016 the Centre was granted observer status at the International Seabed Authority, where it aims to contribute to the establishment of a deep sea mining governance framework for Africa, and to the development of policies and regulatory frameworks for the deep sea mining sector.

## South-South cooperation

AMDC is currently developing a South-South cooperation initiative, designed to make use of the Geological Survey of Brazil's considerable experience in the construction of continental and regional databases; in the development of an Atlas of the 'Blue Economy'; and in mineral exploration in the South Atlantic. This cooperation also aims to facilitate the exchange of experts between African Geological Surveys and the Geological Survey of Brazil, to support the building of African capacity to improve production, management and dissemination of African geological and mineral information.

### Mineral resources, South Atlantic





# Future strategic directions

The GMIS workstream has a substantial programme of future activities. Key areas include:

- Implementation of the GMIS Strategy Plan of Activities: operationalizing GMIS at national, regional and continental levels and in areas of special interest; capacity building for a continental/regional database and geoprocessing centre; and developing a legal and regulatory framework for African GMIS activities.
- Awareness-raising programmes with AU Member States about the importance of the United Nations Convention on the Law of the Sea; and the importance of the sustainable development of activities in the African continental shelf and adjacent international seabed areas. This will include the development of guidelines on strengthening the African legal framework to better support sustainable development of Africa's Maritime Domain and Africa's Blue Economy.
- Facilitating discussions and developing guidelines on how to strengthen the Africa production, management and dissemination of GMI, and how to create spatial data infrastructures to support decision-making, investment and governance of African activities.
- Discussing strategies and developing guidelines for the establishment of African Centres of Excellence on continental and seabed areas mapping and spatial planning. Such Centres of Excellence will be vital in increasing access to continental and marine geo-scientific information, high quality marine research, education and training, and advice to industry and government on complex scientific and policy issues critical to Africa's rights and responsibilities in these areas.
- Discussing possible public and private partnerships for the development of African marine activities, including the preparation of applications for plans of work for exploration in the international seabed area by African companies and governmental agencies.

## The GMIS Workstream – Who we are

**Dr. Kaiser Goncalves De Souza** is the Head of the GMIS workstream of the AMDC. He is also in charge of the AMDC's African Blue Economy Unit. Dr. De Souza has more than 30 years of experience in marine and continental mineral resources research, sustainable development, management, policy elaboration, and business development at national and international levels, as well as in the public and private sectors. He has carried out professional activities in more than 30 countries in South and Central America, the Pacific region, Europe, Asia and Africa. He received his Ph.D. in Earth Sciences from the University of Paris in France. He also completed a post-doctorate in the field of deep sea geology at the Federal Institute of Geosciences and Natural Resources in Hanover, Germany.

**Prof. Aberra Mogessie** is the Principal Consultant for the development of the AMDC's GMIS Strategy. He is Professor at the Institute of Earth Sciences, University of Graz, Austria. As co-author of the CMV Guidebook, Prof. Mogessie has extensive experience and knowledge of AMV issues and more than 35 years of experience in sustainable

mineral development. He acted as the President of the Geological Society of Africa, participated in the development of the Geoscience Information in Africa Network (GIRAF) and was the reviewer of projects such as the AMGI and PanAfGeo.

**Dr. Edwin Egede (consultant)** is the UNECA/AMDC Consultant on the African Blue Economy, especially relating to deep seabed mining. He is a Senior Lecturer in International Law & International Relations at the Cardiff University School of Law & Politics, Wales, and obtained his PhD in International Law of the Sea from the Cardiff University Law School in 2005. He has considerable experience in researching, presenting and advising on a range of Law of the Sea issues, including those related to deep seabed mining. He has authored a number of publications on the Law of the Sea, including *Africa and the Deep Seabed Regime: Politics and International Law of the Common Heritage of Mankind* (2011). In addition, he is a Barrister and Solicitor of the Supreme Court of Nigeria with more than 25 years extensive practice experience.

*Continues, page 14*

## Learning more

### Who we are (contd.)

**Dr. Joao Henrique Goncalves** is the AMDC's Adviser on issues related to geo-information and geo-processing, including geological information systems and database construction. He is a Senior Geologist from the Geological Survey of Brazil. He has more than 30 years of professional experience, including field mapping and prospecting and data integration. He is a Pascal and C programmer and application developer for geology for Windows, Android and iOS. He acted as GIS ArcMap Instructor coordinator for the development of geological databases in many countries of South and Central America.

**Dr. Rosemary Okla** is the AMDC's consultant GIS specialist. She has 17 years of experience in geoprocessing, management and dissemination of data and information. She has a MSc. in Geo-information Science and Earth Observation – specialization in Geoinformatics from the International Institute for Geo-information Science and Earth Observation (ITC), Enschede, The Netherlands, and a Postgraduate Diploma in Geographic Information System (GIS) and the Environment from the Technische Fachhochschule (University of Applied Sciences, TFH), Berlin - Germany.

The AMDC's GMIS Workstream and Blue Economy Unit work in partnership with, and have technical support from, UNECA's GIS and Geostatistic Team.

AMDC publications are free to download at <http://www.uneca.org/publications/african-minerals-development-centre> or search 'African Minerals Development Centre – Publications'.



### Desktop review of African Geological Surveys Organization Capacity and Gaps, 2015

Analyses the capacity of the African GSOs to produce, manage and disseminate geological and mineral information.



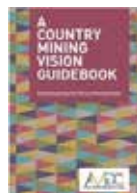
### African Geological and Mineral Information System (GMIS) Strategy, 2016

Promotes geological knowledge as a tool for investment, governance and transparency. It enables African countries to exercise governance over their mineral resources and deal with them in a sovereign manner.



### Africa's Blue Economy: A policy handbook, 2016

A guide to help African Member States to better mainstream their aquatic and marine resources into national development plans, strategies, policies and laws.



### Country Mining Vision Guidebook, 2014

A step-by-step guide to developing and implementing a Country Mining Vision, including planning multi-stakeholder consultative processes, policy design and monitoring and evaluation.

# AMDC Contacts

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## AMDC – Keeping in touch

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[www.youtube.com/user/unecaVideo](http://www.youtube.com/user/unecaVideo)



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