ROADMAP FOR THE GROWTH AND DEVELOPMENT OF THE NIGERIAN MINING INDUSTRY

On the Road to Shared Mining Prosperity

Ministry of Solid Minerals Development
Federal Republic of Nigeria

Cover design by Lawal Bakare (2016)

Table of Contents

List of Figures and Tables

List of Acronyms

Below is a list of the most common acronyms used in this document:

AfDB	African Development Bank
ASMs	Artisanal and Small Scale Miners
BOI	Bank of Industry
CBN	Central Bank of Nigeria
COMEG	Council of Mining Engineers and Geoscientists
DFIs	Development Finance Institutions
DSS	Department of State Services
ECOWAS	Economic Community of West African States
EFO	Energy for Opportunity
EIA	Environmental Impact Assessment
EXCOF	Executive Council of the Federation
FAAC	Federal Allocation Accounts Committee
FIRS	Federal Inland Revenue Service
FMDQ	Nigerian OTC exchange dealing in fixed income, currency and derivatives
KPI	Key Performance Indicator
LGA	Local Government Area
MDA	Ministries, Departments and Agencies
MCO	Mining Cadastre Office
MIREMCO	Mineral Resources and Environmental Management Committee
MIST	Mining Implementation and Strategy Team
MITI	Ministry of IndustryIndustries, Trade and Investments
MoBNP	Ministry of Budget and National Planning
MoE	Ministry of Environment
MoF	Ministry of Finance
MSMD	Ministry of Solid Minerals Development
NAPTIP	National Agency for the Prohibition of Trafficking in Persons
NASS	National Assembly
NCDMB	Nigerian Content Development and Monitoring Board
NEITI	Nigerian Extractive Industries Transparency Initiative
NEXIM	Nigerian Export-Import Bank
NGSA	Nigerian Geological Survey Agency
NIMG	Nigerian Institute of Mining and Geosciences
NMGS	Nigerian Mining and Geosciences Society

NSE	Nigeria Stock Exchange
NUC	Nigeria Universities Commission
PPP	Public-Private Partnership
SMDF	Solid Mineral Development Fund
SMEDAN	Small and Medium Enterprise Development Agency of Nigeria

Foreword

On March 1, 2016, a multi-stakeholder committee was set-up to develop a roadmap for the transformation of the minerals, mining and metals sector. The Nigerian Minerals and Mining Act (2007), with globally competitive sector incentives has been in place since 2007, however, the sector's growth and contributions to GDP have remained less than ideal, accounting for only about N400 billion in GDP (about 0.33%) in 2015. To address this, we began a process to deepen reforms, attract new investors and collaborate with a wide network of partners and stakeholders to build an attractive mining ecosystem.

This roadmap represents our first major landmark in this transformation journey. In the 30 days following its inauguration, the committee worked to crystallize a coherent strategy to rejuvenate the mining sector, which I briefly summarise:

- Nigeria's ambition should be to create a globally competitive sector capable of contributing to wealth creation, providing jobs and advancing our social and human security
- Nigeria can achieve this by focusing on using its mining assets to drive domestic industrialisation initially, and then migrate to winning in global markets
- Nigeria should pursue this strategy through a value chain based growth plan

Building a competitive mining value chain means firms operating in Nigeria must compete on quality and cost versus global peers. Making Nigerian mining competitive means the government and the private sector have to share the responsibility of investing in key drivers of success such as the availability of (and access to) public geosciences data that investors need, the appropriate infrastructure (e.g. railways and bulk ports, mine security networks), specialised technical talent, and of course, superb regulatory and enforcement capacity.

To ensure that the perspective represented by the roadmap is integrative of the many stakeholders around Nigeria, the ministry shared the roadmap with state governors, the National Economic Council and other key stakeholders. In addition, the Ministry participated in a May 2016 National Consultative Meeting generously hosted by Governor Nasir El-Rufai of Kaduna State, which was used to validate the roadmap. The Ministry has now completed incorporating the feedback from Kaduna as well as many written submissions received from mining companies, state governments, civil society groups, and other stakeholders. The input has been used to enrich the roadmap, and we now will move forward to implementation.

In this regard, the Ministry has established an implementation team that will coordinate the work of delivering the roadmap's short, medium and long-term action items. We expect that the Roadmap Committee – ably co-chaired by Professors Ibrahim Garba and Siyan Malomo, and duly served by their esteemed members – will continue to provide the critical advisory support we need going forward. The new team – the Mining Implementation and Strategy Team (MIST) – will focus on ensuring that the key policy, regulatory, technical, environmental and capacity choices necessary to revive and drive investment growth in mining will be taken without fail. We will speak more about the scope, composition and activities of the MIST in the near term.

All recommendations within this finalised document will be considered in the best interest of the nation. We will share the document with the Executive Council of the federation as a compendium of

strategy choices Nigeria will need to make to unlock mining's full potential in the years ahead. Furthermore, given this is intended to be a living document and reflective of key structural shifts in the market and Nigeria's own preferences, the implementation team will continue to refine it periodically, to ensure we remain aligned as a nation on this journey of sustainable mining development. In the end, our goal is to ensure this national document that is supported across the board outlives any administration. Though rejuvenating the mining sector is a cardinal campaign promise of the APC government, ultimately, the successful delivery of the promise will benefit all Nigerians. Mining is a prosperity multiplier for many host communities and states in a way that it will provide both direct and indirect opportunities for many Nigerians, from engineers to truck drivers to lawyers to market women. It is the solemn responsibility of the Government to ensure that such prosperity comes to pass.

That said, it is important to be cautious here. Mining has not been, and will never be, the source of overnight, easy revenues. Companies have to place smart bets based on geosciences data the Ministry can help create. Sometimes their bets pay off, leading them to expand from exploration into production, creating even more jobs and wealth for the country. Other times, they get it wrong and their capital expenditures in exploration have to be written off, with attendant job losses. Mining also carries a significant environmental burden that we must acknowledge and make plans to mitigate in a sustainable manner. All of us within and outside government should understand this cycle, and provide sincere support, as well as moderate our expectations in order to build a sector that can produce sound wealth from what is a wasting asset. Our role as Government is to create an enabling environment to support risk taking by investors who ultimately are the ones that can help create jobs. We will do ourselves and our best interest a disservice if we insist on extracting unearned profits upfront.

I invite you to join us as we continue on the road to rebuilding this sector, unlocking its full potential, and making it one of the key sectoral sources of our future prosperity.

Thank you for your continued support and partnership.

Dr. Kayode J. Fayemi, CON

Honourable Minister

Ministry of Solid Minerals Development

August 11, 2016

Preface

The Honourable Minister and Honourable Minister of State of the Ministry of Solid Minerals Development set up a 17-man committee, to develop a roadmap for the sustainable development of the mining and metals sector in Nigeria.

The committee was made up of representatives across the value chain of the sector and also consulted with other external stakeholders. While the roadmap centres around the path to sustainable development in the sector for next several years, it places special emphasis on the critical issues and challenges which must be addressed for value creation in the immediate, short, mid-term and long-term periods. The roadmap focuses on all areas that must be addressed in order to rekindle and sustain the required momentum for reforms in the sector.

The roadmap is structured, as a guide, using the major hindrances to development that the mining sector faces today, and proposes solutions to overcome these challenges. It prioritises activities for implementation, includes scenarios and case studies as models for successful implementation, and monitors and envelopes these in a coherent, consensus strategy for buy-in of all stakeholders. The current roadmap also leverages prior roadmaps and development initiatives instituted by the Federal Government, and aims to improve deficiencies encumbering the growth of the sector.

The report details a comprehensive set of initiatives, which the committee believes, if implemented, will drive growth of the sector in Nigeria for years to come. Of the many, we would like to highlight a small yet significant one here: We recommend that the name of the ministry be reverted to its former name of “Ministry of Mines & Steel Development” which reflects the appropriate nomenclature of the sector.

The roadmap committee would like to acknowledge the support received from stakeholders. Special thanks go to our resource groups – Bain & Company, PricewaterhouseCoopers (PwC), and Deloitte – for providing very strong support and assisting in steering the deliberations of the committee.

We are grateful for the opportunity to contribute our ideas and visions for the growth of the Nigerian Minerals, Mining and Metals Sector, and would like to thank the Honourable Ministers and Permanent Secretary for the opportunity to serve our country.

Going forward, there should be a concerted effort, from government and all stakeholders, towards implementation of the reform recommendations, to achieve the sustainable development of the sector that we all desire.

Professor Ibrahim Garba (Co-Chairman, Roadmap Committee)

Professor Siyan Malomo (Co-Chairman, Roadmap Committee)

1st March 2016

Acknowledgments

In order to create this roadmap in the relatively short amount of time that we had, the committee was thankful to have benefited from the following set of documents and appreciates the institutions that provided them:

- Roadmap for the Development of the Solid Minerals and Metals Sector (2012)
- Report of the Vision 2020 National Technical Working Group on Minerals and Metals Development (2009)
- The Country Mining Vision Guidebook for Domesticating the Africa Mining Vision (by the Africa Mining Development Center)
- Africa Review Report on Mining - Executive Summary, United Nations Economic Commission for Africa
- Building a sustainable future for Africa's extractive industry: from vision to action - draft action plan for implementing the AMV. AU conference of ministers responsible for mineral resources development, second ordinary session, 12-16 December, 2011, Addis Ababa, Ethiopia
- ASM Handbook for Nigeria by GEUS & MMSD (funded by the World Bank Sustainable Management of Mineral Resources Project)
- Gender Mainstreaming Implementation in the Nigerian Mining Industry – Review Report submitted to the World Bank as part of the Technical Assistance Project for Mining in Nigeria (through an EFO project financed by the Australian and Canadian Governments)

Executive Summary

Nigeria's minerals and mining sector is still largely underdeveloped despite its glorious past and abundance of mineral resources for development, including high value metallic minerals[1], industrial minerals[2], and energy minerals[3].

In 2015, the sector contributed approximately 0.33% to the gross domestic product of the country. This contribution is a reversal from the historically higher percentages (about 4-5% in the 1960s-70s). However, following a decade of reforms starting in 1999, this contribution represents a cautiously optimistic restart of the development of the sector. The decade of reform saw key changes including, the passage of a new Nigerian Minerals and Mining Act (2007), a Nigerian Mineral and Metals Policy (2008), the creation of a modern Mining Cadastre system, the refinement of the tax code, and the expansion in airborne mapping of the country to sharpen knowledge of the mineral endowments. As important as these progress steps have been, Nigeria can and should do more. The sector faces several challenges with geosciences data and information, Industry participants, Stakeholders, Institutions, Governance and other enablers of the sector.

Barrier Type	Severity	Summary of Constraints/Challenges
Geosciences data and information	Moderate to High	• Nigeria, despite recent progress, has a weak mechanism for gathering, disseminating and archiving critical geological data required by investors and policy makers
Industry Participants	Moderate to High	• Operators across mining value chain face a range of challenges from insufficient infrastructure to policy uncertainty that together constrain investor confidence
Stakeholders	Moderate	• Decline of industry reduced the focus and leverage of key stakeholders, hence flows into the sector e.g. resources, talent and partnerships declined
Institutions and Governance	Moderate	• Ministry's organisational design and regulatory agencies mix needs to be refined to ensure clear enforcement of its rules and separation of powers between the states and the Federal Government strictly enforced
Key Enablers	Moderate to High	• Ancillary requirements for the proper functioning of the minerals and mining ecosystem such as talented labour, infrastructure – e.g. railroad, competitive financing systems, mine and asset security, and related support services – are missing

In addition to these challenges listed, one of the most critical factors towards creating an enabling environment for exploration and mining is investor perception. Undue interference by communities and state governments, with expectations outside the provisions of the law/regulations cripple investments and the development of the mining sector. Uncertainty and inconsistency in state and federal laws, interpretation and enforcement will hamper development. The perception of a change of regime affecting laws also stalls investment and partnership. Fiscal policies that remain stable and predictable in the face of changing regimes improves transparency and fosters good governance within the sector. We address the need for strong communication strategies between the nation and

[1] Examples of high value metallic minerals in Nigeria gold, coltan, lead-zinc, iron ore, cassiterite, etc.

[2] Examples of industrial minerals include limestone, barite, clays etc.

[3] Energy minerals include coal, lignite and bitumen among others

the international community and between all stakeholders as one of the solutions towards benefits sharing, agreeable and accountable development of the minerals and mining sector.

Based on an evaluation of the long-term opportunities that can be unlocked if additional transformation is embarked upon, the Committee believes that mining can deliver the jobs, prosperity and additional revenue for the country.

Strategic Framework

To rebuild the sector and unlock its full potential, the Committee has recommended the following strategic framework:

- **Aspiration**: Build a world class minerals and mining ecosystem designed to serve a targeted domestic and export market for minerals and ores
- **Where to Play**: Rebuild Nigeria's minerals, mining and related processing industry in 3 phases:
    - Phase 1: Nigeria should seek to rebuild market confidence in its minerals and mining sector and win over domestic users of industrial minerals that are currently imported. During this Phase, Nigeria should also seek to expand use of its energy minerals.
    - Phase 2: Nigeria should focus on expanding domestic ore and mineral asset processing industry.
    - Phase 3: Nigeria should seek to return to global ore and mineral markets at a market competitive price point.
- **How to Win**: Build a minerals and mining sector initially focusing on using its industrial mineral endowment to support its industrialisation. Government policy should seek to support private industry by building overall competitiveness (e.g. quality, price, loss ratios) and improving the ease of doing business, in collaboration with other government agencies. Nigeria should seek to create domestic demand by competing to replace ores and minerals currently imported. Over time, with an expansion in domestic processing, Nigeria should seek to build a cost-led sector, as well as production expertise in select non-industrial minerals.
- **Key Enablers**: Invest in a range of enablers including bulk handling terminals, railroad and rolling stock capacity, technical and engineering capacity, regulatory reform, reorganisation of the Ministry itself, and expansion of access to financing to drive sector transformation. A key element of the regulatory reorganization will involve creation of a new "super" Regulatory Agency that will merge and streamline the current functions of the Mining Cadastre, Mines Inspectorate and Mines Environmental Compliance.

Implementation Objectives and Action Plan

The initiatives and strategies outlined in this roadmap are designed largely to address the key challenges that have been identified, outlining a strategy for the near term for the industrial and energy minerals, as well as the steel sector. Within each category, a set of objectives were identified as core to overcome the stated challenges and these are outlined as follows:

- **Minerals & Steel**:
    - *Developing an industrial minerals strategy* to boost the local economy through utilisation of domestic minerals
    - *Developing an energy minerals strategy* for domestic use and industrial power generation using Nigerian coal resources
    - *Developing the steel sector* to provide a solid backbone for the manufacturing and industrial economy

- **Institutions and Governance**:
    - *Building the organisational and functional capabilities of the supervising Ministry*
    - *Improving enforcement of existing regulations by streamlining and merging the current functions of the Mining Cadastre, Mines Inspectorate and Mines Environmental Compliance into a new "super" Regulatory Agency*
    - *Building a stronger and aligned regulatory framework for the industry* by
        - Resolving regulatory conflicts in the existing legal and regulatory framework of the industry
        - Improving policy consistency and direction
        - Improving the environmental sustainability of the industry
        - Improving enforcement of existing regulations
    - *Ensuring stronger economic and political coordination of minerals and mining policy in Nigeria*
- **Stakeholder Engagement:**
    - *Improving the engagement of the States with minerals and mining sector*, particularly around financial participation, revenue sharing, and coordinating oversight with the federal ministry
    - *Improving the engagement of communities* through coordination of corporate social responsibilities, incentivised participation, and education
- **Industry participants**:
    - *Attracting majors into the industry* by stabilising long-term minerals and mining policy and incentivising investments in large-scale mining equipment and infrastructure
    - *Promoting junior explorers* through sustaining favourable enabling environment to attract low risk exploration investments
    - *Promoting formal small scale operators through* expanding access to funding and supporting knowledge development to drive local content
    - *Effectively monitoring and regulating informal and/or illegal mining operations*
    - *Encouraging wider participation in beneficiation, downstream processing and refining* through incentivising forward integration by existing participants
    - *Improving trading and ease of transactions* through the set-up and formalisation of metal exchanges and mineral certification authorities
- **Geosciences data and information:**
    - *Improving the quality and breadth of geo-scientific data gathered* in a cost-efficient manner that will adequately drive investment growth
    - *Adequately archiving and disseminating the information gathered in modern formats* to ensure ready accessibility to investors and other interested parties
- **Enabling environment:**
    - *Building the required technical and managerial skills and capabilities locally* to ensure the supply of steady talent required by the sector in the future
    - *Ensuring social equity in the labour force* by addressing issues of exploitation of women and children
    - *Creating the necessary ancillary infrastructure to accelerate growth of the sector* nationally and regionally
    - *Broadening access to finance and improving the business climate in Nigeria* to increase attractiveness of (foreign) investments in the sector

Effective implementation rests on the ability to conduct a phased execution to align with financial resource availability and team capacity. In addition, some initiatives are prerequisites for accomplishing the rest. Based on that, we have built execution timeframe into the roadmap as follows:

- **Immediate**: Initiatives that need to begin right away. These are expected to be initiated in June 2016
- **Short-term**: Initiatives between the first 6 months and 2 years of the plan going into effect
- **Medium-term**: Initiatives that are expected to start between 2 and 5 years of the plan
- **Long-term**: Between years 5 and 10 of the plan
- **Ongoing**: Initiatives that span the lifetime of the plan and may be revisited

These initiatives, together with their outcomes are summarised below:

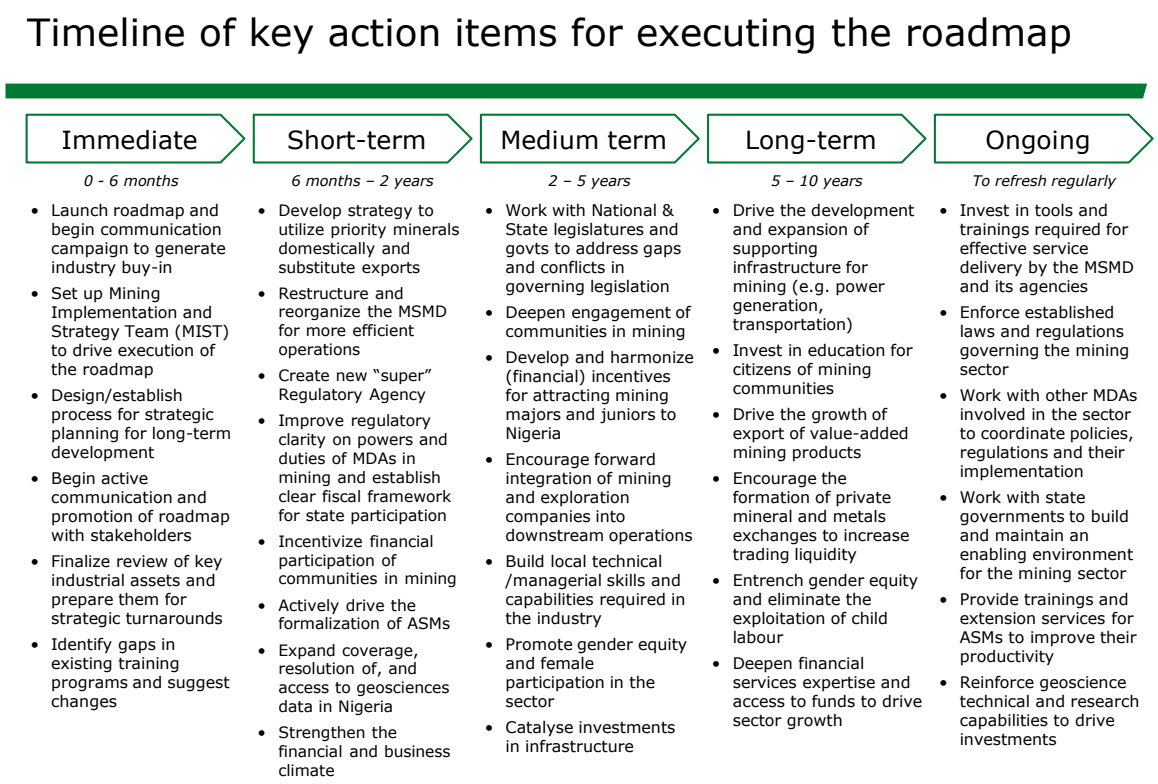

Figure 1: Action items for the policy roadmap

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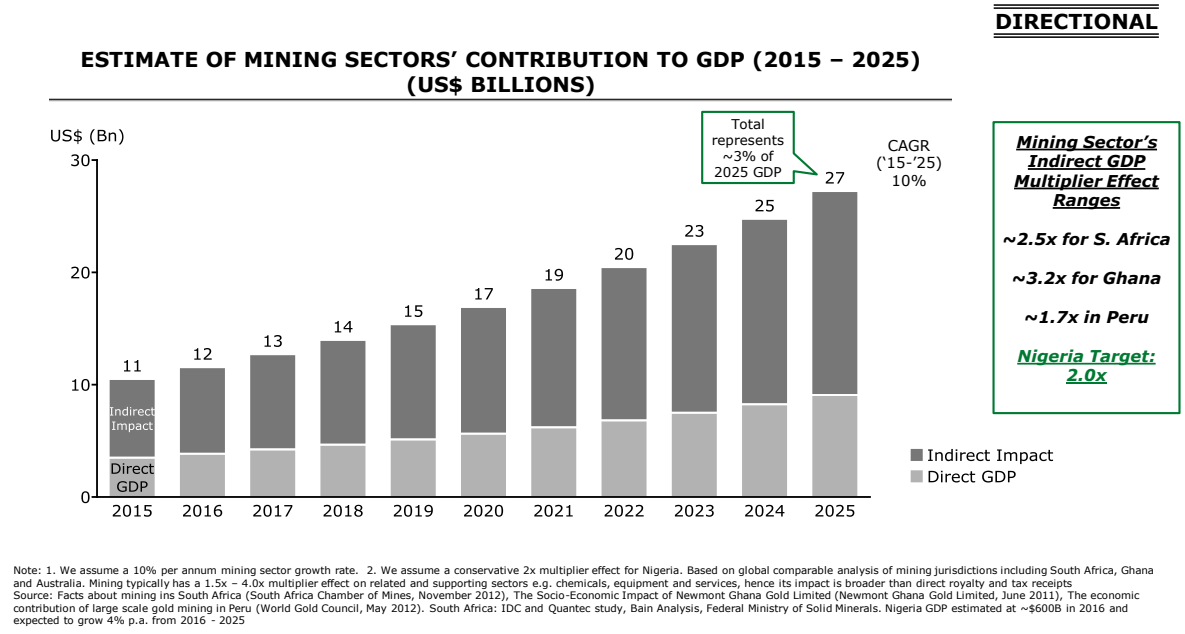
Should Nigeria successfully implement the proposed recommendations, growth is expected to return to the sector in the form of new exploration activity, operations and production from active mining, functional (and expanded) processing and refining capacity, and higher value-addition in exports. The net outcome will be creation of thousands of direct jobs and potentially hundreds of thousands of indirect jobs. Furthermore, the impact on GDP will also be significant as industries are able to use the output of the sector better, substituting for imports.

Successful execution of a mining plan will unlock significant value for Nigeria



Note: 1. We assume a 10% per annum mining sector growth rate. 2. We assume a conservative 2x multiplier effect for Nigeria. Based on global comparable analysis of mining jurisdictions including South Africa, Ghana and Australia. Mining typically has a 1.5x – 4.0x multiplier effect on related and supporting sectors e.g. chemicals, equipment and services, hence its impact is broader than direct royalty and tax receipts
Source: Facts about mining ins South Africa (South Africa Chamber of Mines, November 2012), The Socio-Economic Impact of Newmont Ghana Gold Limited (Newmont Ghana Gold Limited, June 2011), The economic contribution of large scale gold mining in Peru (World Gold Council, May 2012). South Africa: IDC and Quantec study, Bain Analysis, Federal Ministry of Solid Minerals. Nigeria GDP estimated at ~$600B in 2016 and expected to grow 4% p.a. from 2016 - 2025

Figure 2: Mining sector's contribution to GDP

Finally, to ensure effective execution of the Roadmap, the Committee has recommended the formation of a Mining Implementation and Strategy Team (MIST) that will be the process owner of the Roadmap and will be accountable for its implementation. MIST, as an advisory team to the Minister, will work across multiple MDAs, stakeholders and private institutions to ensure that the full potential of the minerals, mining and metals sector is achieved.

Chapter 1 – The Industry Today

Overview

Mining in Nigeria is at crossroads. Today the sector accounts for 0.3% of national employment, 0.02% of exports, and about N400B of Nigeria's GDP (~0.3%), a significant decline from the early 1980s when the contribution was much larger (in percentage terms). These figures are low, especially given the comparative contribution of minerals and mining to the economies of other countries in Africa like Ghana, Cote D'Ivoire, South Africa and the Democratic Republic of Congo.

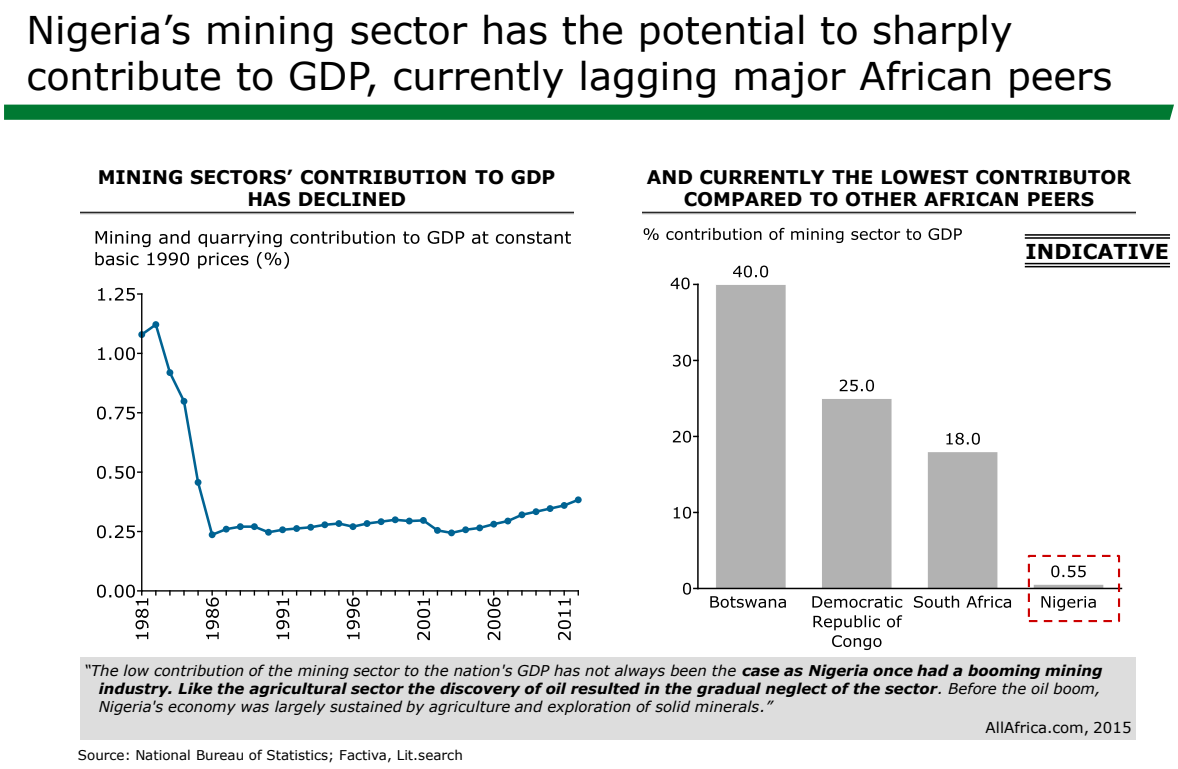


Figure 3: Historical contribution of minerals and mining sector to Nigeria's GDP

Sector Reforms: The Path to Recovery (1999 – 2016)

With the return to democratic governance in 1999, the Federal Government of Nigeria initiated comprehensive policies and programmes to ensure that the various natural resources of the country were harnessed for self-sustained growth and development. In particular, the development of solid minerals was identified as a major sector to aid the diversification of the economy away from oil. Government would create an enabling environment for full involvement of the private sector in multi-sectoral economic development.

Subsequently, the Obasanjo administration (1999 – 2007) constituted a committee to produce a seven-year strategic plan for the development of solid minerals in Nigeria. The report of the committee provided a basic framework to grow the sector, build both infrastructural and human capacity and provide pro-poor strategies for ASM operators.

The report became the basis for the government's mining sector reforms in 2005 – 2006. In that period, the government carried out a root and branch review of the sector and implemented reforms that structurally changed the nature of the sector. The reforms marked the redefinition of the role of government to that of an **administrator-regulator** and the acceptance of the private sector as **owner-operator.** Flowing from the new policy were actions that have been responsible for the new drive into the sector. Highlights of the reforms include but are not limited to the following:

- Restating the constitutional exclusivity of the control of mineral resources by the Federal Government
- Development of the 2007 Nigerian Minerals and Mining Act
- Development of the 2008 National Minerals and Metals Policy
- Development of the 2011 Nigerian Minerals and Mining Regulations
- Establishment of the Mining Cadastre Office (MCO) for mineral rights management
- Establishment of the Nigerian Institute of Mining and Geosciences (NIMG)
- Enhanced geoscience data collection across Nigeria
- Establishment of control departments for Mines Environmental Compliance (MEC) and Artisanal and Small Scale Mining (ASM)

The Act and the supporting body of regulation have been designed to give Nigeria a world class legal and regulatory framework for the sector. For example, in the design and set-up of MCO as the sole issuer of mineral titles today, a great deal of effort went into understanding the best practices globally. MCO's predecessor has overseen a cumbersome process fraught with inefficiency, opacity and long delays. For this reason, the office adopted a "first-come-first-serve" and non-discretionary approach to granting mineral titles. Today, the MCO issues 6 types of licenses and permits to cover all activities from exploration to mineral production[4]. Licenses which can be granted in 30 – 45 days are issued using transparent rules and regulations. As a result, as of 2016, MCO has issued thousands of licenses to the Nigerian mining industry. Furthermore, there has also been a recent submission of the Solid Minerals Producing Areas Commission Bill to the National Assembly[5]. Subject to careful review of the provisions of the proposed bill, the Ministry will continue to work closely with appropriate stakeholders to ensure that the core intent of the bill is met while remaining within the spirit of the overall Mining Act.

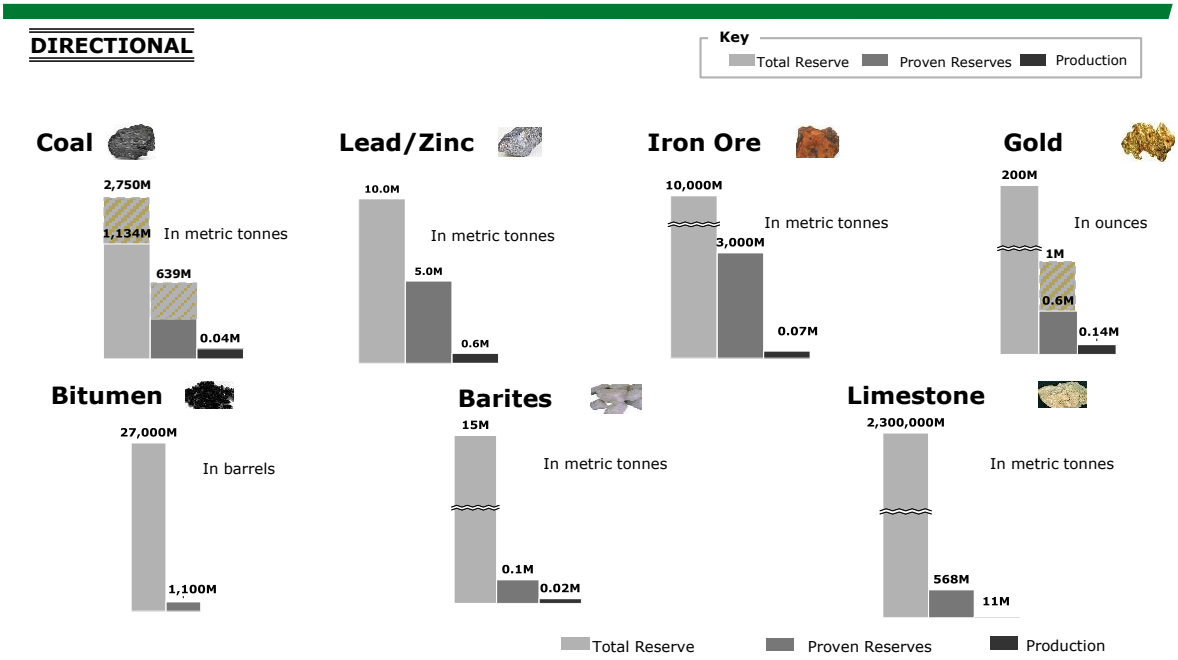
Mineral endowment

Nigeria's mining sector is diverse in mineral resources, includes high value commodities (e.g. gold), bulk commodities (e.g., iron ore and tin), as well as gemstones and dimension stones. In previous roadmaps, the government designated a number of strategic minerals that it believed had the potential to make a significant contribution to Nigeria's economic development. These include barite, gold, bitumen, iron ore, lead/zinc, coal and limestone. While we acknowledge that these minerals do have importance, we believe that this list can be updated and modified in response to emerging global and country development trends.

[4] These licenses are the reconnaissance permit, exploration license, small scale mining lease, mining lease, quarrying license and water use permit.

[5] This bill is currently (as of March 2016) at its third reading in the House

Nigeria priority mineral resources remain largely untapped



Note: For total and proven reserves the lower and the upper estimates have been shown, Production data latest available for 2012 from USGS
Source: Lit search, Bain Analysis, FMSM

Figure 4: Reserves and production estimates on Nigeria's strategic minerals

Nigeria's mineral resources can be categorised according to their usage, or the geological terrains in which they are found. In terms of use, mineral resources of Nigeria are generally classified into five broad groups:

- Industrial minerals (e.g. barite, kaolin, gypsum, feldspar, limestone)
- Energy minerals (e.g. coal, bitumen, lignite, uranium)
- Metallic ore minerals (e.g. gold, cassiterite, columbite, iron ore, lead-zinc, copper)
- Construction minerals (e.g. granite, gravel, laterite, sand)
- Precious stones (e.g. sapphire, tourmaline, emerald, topaz, amethyst, garnet, etc.[6])

These minerals are found in the different geological (age/lithological) groups in Nigeria which form three main categories:

- Pan-African basement rocks (e.g., gold, coltan, iron ore)
- Mesozoic Younger Granites (tin, columbite, etc.)
- Cretaceous-Tertiary sedimentary basins (lead-zinc, barite, limestone, coal, bitumen, etc.)

However, some minerals are found in more than one group. These are discussed in detail in Appendix I.

[6] The mineral lists are only indicative – they are not exhaustive

Geoscience Data and Information

Nigeria's public geoscience data is provided by the Nigerian Geological Surveys Agency (NGSA), the government institution responsible for generating, archiving and disseminating geoscience data and information in the country. At present, the Agency has published 107 geological maps at 1:100,000 scale as well as about 428 corresponding[7] geological maps at 1:50,000 scale. New mineral locations have been discovered, geo-referenced and captured on the Agency's mineral occurrence database while publishing both zonal and state mineral and geological maps. More than 2 million line kilometres of magnetic, gravity, electro-magnetic and radiometric data has also been generated. The survey isolated areas of possible mineralisation, and geophysical ground follow-up studies were subsequently undertaken based on the lead provided by airborne geophysical anomaly signatures. NGSA's geochemical mapping project has also covered eight Global Reference Network (GRN) Cells and followed up with high-resolution sampling of the completed eight cells. More than 8,000 samples have so far been analysed for major and trace elements resulting in new mineral discoveries. NGSA maintains a web based information dissemination platform where bulletins, records, occasional papers, maps, mineral and core log databases, etc. are available.

Regulatory Framework

Nigeria's mining and metals industry is governed by a number of legal and regulatory instruments. The primary instruments are the 2007 Mining Act and the 2008 Minerals and Metals Policy. The exhibit below summarises the key provisions of these instruments and as the comparison with other leading mining jurisdictions would indicate, Nigeria has a robust framework to govern its mining sector. While Nigeria has a low investor perception score, it's likely that as more investors come to understand Nigeria's new mining push, perceptions will start to shift given how comparable Nigeria's regulatory regime is to some of the best mining investment destinations.

[7] For every map at the 1:100,000 scale, you need 4 maps at the 1:50,000 scale to cover the equivalent area

Nigeria has a robust mining regulatory framework but needs to improve its policy perception scores

		Australia	Chile	South Africa	USA	Nigeria
Corporate Income Tax		30%	20%	28%	40%	20-30%
Royalty	Coal	2.75-15%	0-14%	0.5-7%	8-12.5%	3-5%
	Gold	2.5-5%	0-14%	0.5-7%	4-10%	3-5%
	Copper	2.5-5%	0-20%	0.5-7%	4-10%	3-5%
	Iron ore	5.35-7.5%	0-14%	0.5-7%	4-10%	3-5%
Financial Incentives		• EDI encourages shareholder investment in small exploration companies by offering tax credits	• Companies under stability tax agreements charged flat tax rate (4-5%), lower than progressive tax rate paid by others	• CAPEX by mining companies can be fully deducted against tax - E.g. spending on prospecting; mining equipment etc.	• Tax structure permits depletion deduction which can lower federal income tax rate by ~3%	• Tax holiday for an initial period of 3 years from commencement of operations
Custom duty		• 5% import duty for importing mining equipment • Additional import processing charge	• 6% import duty for importing mining equipment	• 0% import duty rate for importing mining equipment	• 0% import duty rate for importing mining equipment	• Exemption from custom and import duties on mining equipment*
Lease duration		21 years	Indefinite	30 years	20 years	25 years
Ownership requirement		• Acquisition of 15% or more interest in any Australian mining co • Acquisition of interest in an operational mine	• Non-discrimination between domestic and foreign-owned entities	• 26% stake by a local directly or via holding Co.	• N/A	• Foreign company to incorporate local subsidiary (with exceptions)
Mining production index (2014)		131.2	111	98	133.9	84.1
Policy perception index (2013/14)		76.61/70.47**	70.86/72.23	39.78/44.47	71.8/69.08**	30.54/10.63

Notes: EDI = Exploration Development Incentive, EPBS = Enhanced Project By-law Scheme; higher mining production index indicates better performance. Policy perception index is the outcome of surveys of investors working in the market. Nigeria's scores reflect the absence of global mining majors and juniors
Source: Fraser institute annual- Survey of Mining Companies, 2014; Literature Search

Figure 5: Business climate for mining in Nigeria

Mineral Licensing

In order to conduct exploration and production activity in Nigeria an investor requires a license. These licenses – one of six types issued – is granted solely by the Mining Cadastre Office (MCO). The MCO at present has issued various licenses across the federation, and an analysis of the types of licenses issued by stage in the life cycle and type of mineral provides an indication of investor sentiment. The exhibit below provides an indication of current licenses outstanding by mineral type and location of mining activity.

Cumulative mineral licenses granted in Nigeria till 2015

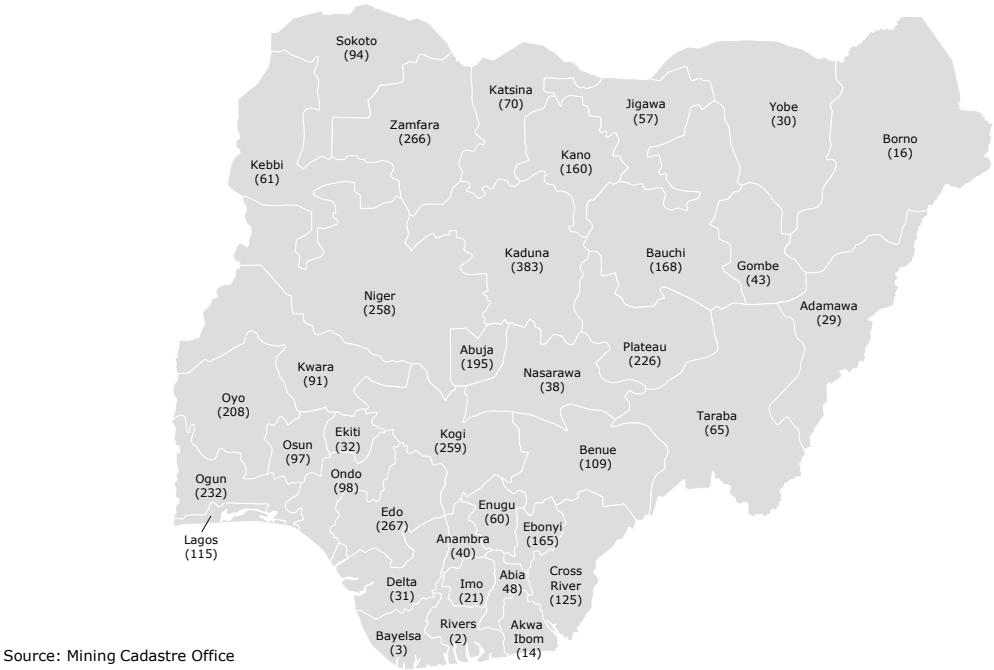


Figure 6: Distribution of mineral licenses granted in Nigeria till 2015

Production and Revenue

Today, mineral production data in Nigerian mining is unclear and inadequate. A reasonable conclusion can be drawn that the industry is constrained, however, given the historical under-reporting of production by existing firms, together with the fact that most of Nigeria's mineral production is conducted by artisanal miners, it is believed that the production figures are understated.

Mineral revenues are often in one of the two markets: local consumption and exports. Local consumption accounts for majority of the market, as minerals contributed only about 0.02% of the reported exports in 2012. In a number of cases, the excess of demand over local production makes Nigeria a net importer of minerals. This is despite the presence of huge potential for some of these minerals, highlighting the market opportunity that exists from import substitution[8].

[8] For example, Nigeria imports significant amounts of coal and iron ore despite the potential endowment it has. Nigeria used to import barytes until 2003 when the government banned imports to boost production. Today, Nigeria is a net exporter.

From the available statistics and data available from Industry participants, it is evident that presently, data and revenue leakages are a challenge. Be that as it may, the limited data reported would suggest that a significant amount of exporting is occurring out of Nigeria. Nigeria today exports a range of minerals into global markets. Minerals exported in 2015 include tin ore, gold, manganese, tourmaline, aquamarine, beryllium ore, gypsum, and coal[9].

Industry Participants

Similar to other extractive industries, companies in the mining sector are generally classified along the value chain: exploration and mining, logistics and transportation, refining and processing, and trading, manufacturing/wholesale and retail activities.

Exploration and Mining

These companies focus primarily on exploration and production of the minerals with relatively little beneficiation. Within these are:

- **Majors**: These are well-capitalised international firms (>$20B in assets) with a significant geographic mining footprint and diversified portfolio across several minerals. Examples include BHP Billiton, Anglo-American, Vale and Rio Tinto.
- **Junior explorers:** These are generally smaller than the majors and tend to be more specialised in mineral exploration activity, focusing more on exploration than on mining.
- **Small Scale Miners:** Even smaller than the junior explorers, these tend to practice mining with some levels of mechanisation, incorporating artisanal miners and hired labour for a lot of manual mining activity. Often, mechanisation is for blasting, clearing the overburden and earth moving.
- **Artisanal miners:** These are miners who generally utilise very low/no levels of mechanisation, undertaken by individuals, families, or small groups. These activities are possibly on a subsistence level, and are often seasonal or supplementary to other economic activities, and in many cases are informal (outside of the legal system). Presently, Artisanal miners as defined often have no mineral title license. They may work legally or illegally for a mineral title owner, they also work on un-assigned tenements and often end up being accidental trailblazers into mineral asset discoveries. Trespassing on valid and active licenses is also an issue. In these cases there is a blurred line between informal ASM and illegal mining.
- **Illegal miners:** Within this framework, Illegal mining would need to be properly defined and addressed as a criminal industry with national and international syndicates that are involved in mining without valid permits or who violate the constraints of the mineral licenses they possess[10]. Presently, Illegal mining activity is widespread among Nigerians, neighboring nationals and citizens of countries much farther. Among Nigerians and regional nationals, very often the miners travel from other states and regions to engage in mining activities. A lot of these artisanal miners are nomadic in nature. They migrate to work where their yields are high

[9] List of export minerals were based on the data from permits issued by the Ministry

[10] For example, a person/company who produces based off an exploration license has violated the terms of their license and is thus an illegal miner.

and their time-energy investments are low. They quickly migrate at the prospect for potentially higher yields with lower efforts. They harbor no desire to settle in any place. Perhaps for this reason, it has been observed that there is more order, structure and accountability in artisanal mining groups consisting of people from the locale of the mining area than the mining groups of the non-natives[11].

Nigeria does not currently have any of the majors in active operation due to its relatively undeveloped mineral assets. There has been a few intermediate to junior mining firms actively engaged in the sector, mostly from Australia, UK, China, Ukraine, and India and focused primarily on exploration and mining of gold, iron ore, lead-zinc, and coal. There are also some indigenous small companies involved in small-scale mining activities. Presently, the most active participants in the sector are the quarry operators for construction stones (mostly aggregates), cement companies for limestone, artisanal miners and mineral traders.

- **Quarrying**: As of December 2015, there were 633 companies involved in the mining sector. Most of these companies are quarry operators. Over 90% of the revenue accrued to the government in terms of royalties on minerals come from quarrying operations. Most of the quarrying activity supplies the local construction industry and, in recent years, has begun supplying local cement manufacturers
- **Mineral Trade and Artisanal/Small Scale Mining**: Mineral Traders and the ASM sub-sector are intertwined. Market dynamics and ready market availability fuel the supply of minerals, increasing the mining activity of in-demand minerals. For instance, consistent availability of mineral traders for lead, zinc, tin, gold, coltan and gemstones has strengthened the ASM activity for those minerals. These minerals enjoy strong demand by mineral traders as they remain profitable despite high logistics costs and the inelasticity of the local mineral market
    - While the market for gold and gemstones may be instinctively understood due to their high worth-low volume characteristics, the market for bulky lead/zinc is unique. High quality galena and sphalerite (that contains lead and zinc) in Nigeria have been the most tolerant of high logistics costs and market dynamics. The consistent demand for high grade galena has supported the continuous ASM activity in small scale mining of lead and zinc across Nigeria.
    - The present market chain for lead-zinc includes the license owner, ASM operators, local mine buyers, aggregators, warehousing, crushing, transportation, inspection, assaying, shipping and several middlemen buyers in-between. The competition for supply often sees the injection of funding and equipment on behalf of traders towards ASM to increase and guarantee supply. As earlier mentioned, data and revenue leakages for minerals traded out of Nigeria are a present challenge.
    - Clearly, a few of the big driving forces for activity in the sector: quarrying & ASM activity in Nigeria, have been- the availability of a ready local industry and the mineral

[11] People that live in the mining community typically comply with a social and communal structure that demands accountability to elders, land and farm owners as they have ties to the community and as such need to preserve its social fabric. However, those outside the area do not have the same strong ties, and as such are more likely to violate social norms and also cause environmental damage given little incentive to address them. While this is certainly not the case for all non-natives, it is a perception amongst a lot of native communities that their only concern of the non-natives is immediate profit through exploitation and not the long-term or continuous harmony of the community and the environment

traders. In recent years, a new trend is emerging where minerals mined outside Nigeria in neighbouring countries are being routed through Nigerian ports for export.

Logistics and Transportation

These companies focus on the transportation of the ore products either to processing plants (smelters and refiners) or for exports. In the oil and gas industry (due to the fluid nature of the product), this transportation occurs largely by tankers and pipelines, while in mining it is typically done by cargo via road, rail or ship.

Given the bulk nature of mining, transport costs can be a significant fraction of production costs. As such, many exploration and mining companies prefer to integrate the logistics and transportation component into their operations to better manage costs, and in many cases, processing facilities are located right next to the mines, eliminating the need for transportation altogether. However, a number of companies focus purely on the midstream[12].

Nigeria does not have any dedicated logistics and transportation companies as its mining sector is still in its infancy and its infrastructure is sub-par.

Processing and Refining

This segment of the industry focuses on the beneficiation of the mineral ore and refining it into industrial products. Examples include metal fabrication and alloy manufacturing, and, in the case of energy minerals (e.g. coal) - power generation.

As with the logistics and transportation segment, a number of companies also prefer to integrate downstream operations to manage costs and capture some of the value from that segment. In Nigeria, there are a few examples of these, the most significant of which includes processing companies such as Delta Steel Limited.

Institutions – Regulatory, Oversight, and Technical

The main federal institution that oversees mining activity in Nigeria is the Ministry of Solid Minerals Development (MSMD). The ministry is organised along several technical directorates and agencies, namely: Mines Inspectorate, Mines Environmental Compliance, Artisanal & Small Scale Mining, Mining Cadastre Office, Metallurgical Inspectorate and Raw Material Development, and Steel & Non-Ferrous Metals, the description of which is given below:

- *Mines Inspectorate*: Has overall responsibility for the supervision of industry operations including exploration, evaluation, mine development and production activities. The department is also responsible for enforcement of mining laws and collection of revenues.
- *Mines Environmental Compliance*: Responsible for the enforcement of environmental best practices in mining. Functions of the department include the establishment of environmental procedures and requirements applicable to mining operations; the review of all plans, studies and reports required to be prepared by holders of mineral titles; and the monitoring and enforcement of compliance with all environmental requirements and obligations.

[12]For example, Transnet Corporation in South Africa manages the transport of thermal coal to, and export from the Richards Bay Coal Terminal

- *Artisanal & Small Scale Mining*: Responsible for the formalisation of the operation of ASM operators and provision of extension services.
- *Mining Cadastre Office (MCO)*: Responsible for the administration of mineral titles. The institution is defined by the Minerals and Mining Act to be an autonomous institution and the sole agency regarding all matters relating to mineral titles. The institution is also responsible for interfacing with investors in respect of granting and processing of mineral titles and is responsible for the maintenance of a cadastral atlas and title registers.
- *Metallurgical Inspectorate and Raw Material Development (MIRMD):* Responsible for metallurgical inspectorate matters and the development of mineral raw materials for the metallurgical industry, and advises the Ministry on both. The department also sets up standards of steel produced in the Country, in liaison with appropriate bodies.
- *Steel & Non-Ferrous Metals*: Focused on implementing the objectives of the National Metals Policy as defined in the National Minerals & Metals Policy (2008). Specific responsibilities include: regulating tariffs on metal commodities and products, monitoring developments in other sectors of the economy that may have adverse effects on the metals sub-sector and recommending appropriate actions, monitoring and ensuring compliance by the metals industry operators with environmentally friendly and technically safe operation; and ensuring enforcement of the utilisation of local metal industry products in all government contracts.
- *Nigerian Geological Survey Agency (NGSA)*: Responsible for the generation of geoscience data for investors and the general public. Like other geological surveys in the world, the NGSA is expected to focus on the acquisition, management, storage, interpretation and communication of geoscience information to promote the country's resource potential and thus encourage investment in detailed mineral exploration by the private sector.
- *Nigerian Institute of Mining & Geosciences (NIMG)*: The institute trains the requisite manpower for the emerging mining industry. Its mandate includes the provision of postgraduate training in mining and geosciences, short courses in mining, geosciences and extension services, research and development, and consultancy services.
- *Nigerian Metallurgical Development Center (NMDC)*: The institution was established to lead mineralogical appraisal and evaluation of mineral ore samples, flow sheet development, and development of both conventional and refractory products using indigenous mineral raw materials among others.
- *National Steel Raw Materials Exploration Agency (NSRMEA)*: The agency carries out the exploration of steel raw materials in all parts of Nigeria and elsewhere for the iron and steel industry. It is focused on establishing and executing a steel raw material base, including mineral resources management, monitoring, resource utilisation studies and inventory in relation to the iron and steel industry.
- *Council of Mining Engineers and Geoscientists (COMEG):* Established through Decree No. 40 of 1990, the mandate of this institution is to regulate and control the training and practices of professionals in the extractive industries. One of its primary responsibilities is to maintain a register of all professionals, including mining engineers, metallurgists, geoscientists and others in related fields, who are to practice the above professions within Nigeria.

Summary

Nigeria's mining industry exists today, despite its current low production and output, within a well-defined regulatory structure, supported by active professional bodies and agencies, with a number of

active participants across the mining value chain. Yet, it continues to struggle with a number of challenges that limit its full potential growth and these are explored in detail in the next chapter.

Chapter 2: Constraints and Challenges to Full Potential

Overview

Nigeria's minerals and mining sector has underperformed since the 1970s, initially as a result of poor policy choices, which subsequently became compounded by deterioration in the fiscal regime, infrastructure, and the shortage of investment in quality geosciences data. Stretched over two decades, these challenges have since become a growth limiting constraint on the sector's full potential. In this chapter we discuss the key challenges facing the industry through 5 primary lenses:

- Geosciences
- Industry participants
- Stakeholders
- Institutions and governance
- Key enablers

We believe that by addressing these primary challenges, the sector can be set more firmly on the path to growth.

Geosciences

Nigeria's geosciences challenge continues to constrain investment decision-making. These constraints include data collection at the appropriate level of accuracy and its timely dissemination to national and international investors. Specifically, some of these challenges include:

- Limited Resource Mapping and Quantification: In recent years, Nigeria completed a High Resolution Airborne Geophysical Survey involving magnetic, radiometric and limited electromagnetic surveys aimed at assisting and promoting mineral exploitation[13]. That survey was one of the first significant efforts in over three decades to update Nigeria's geological dataset. While this was an important start, it remains insufficient for initiating and building investor confidence in the mining industry.
- Dissemination, Archiving and Reporting: Nigeria also faces challenges disseminating the data once collected. Today, the Nigerian Geological Survey Agency (NGSA) has begun to collect and evaluate sizeable amounts of information on the location and quantity of available minerals. However, much of this remains unknown to the sector. This is because much of the collected information is not readily available through channels like web portals or publications in widely read journals which most interested parties engage with. Limited accessibility of information continues to constrain investment, as low-knowledge about the potential value of a resource causes investors to foresee higher costs in establishing the specifics of the reserves, rendering them unlikely to pay higher rents. In addition, data that Nigeria historically had access to (such as those collected during the colonial period) has been stolen, destroyed or simply lost due to poor archiving. As a result,

[13] Between 2003 and 2009, the Federal Government invested significantly in conducting airborne geophysical surveys of the country. This represents 2.5 million line kilometers for the magnetic, 1.94 million line kilometers for the radiometric and 0.45 million line kilometers for the gravity data. The project provided complete coverage for the country on a) magnetics b) radiometrics (less the Niger Delta) and c) gravity for the Niger Delta

there are limited returns on investment in data gathering, as it has been seen to be a repetitive process, increasing costs and limiting participation. Furthermore, industry operators who by law are required to report their mining activities to the Ministry often fail to do so, limiting data availability on exploration, production and processing as a result.

Struggling Industry Participants

The industry's participant mix continues to be tilted towards smaller scale miners due to risk perception among larger scale miners. That has resulted in insufficient capital inflows, which are needed to make the types of long-range commitment a sectoral transformation requires. A remediation strategy needs to create conditions for the competitive mix to shift towards a more balanced structure while addressing:

- Majors: There are no large-scale miners in operation in Nigeria today outside of the limestone industry. Discussions with industry participants indicate that two main reasons are causing investors to hold back:
    - **First:** Investors perceive the policy and investment climate to be hostile to business. Nigeria's scores on Fraser Institute surveys signal continued investor anxiety despite recent efforts.
    - **Second:** Investors often cite a lack of required infrastructure from mining districts e.g. reinforced roads, dedicated rail lines and port capacity. The continued inability to complete the rail link between Ajaokuta, Warri and Itakpe is a glaring example of this. The continued problems in the power sector are also additional challenges as they increase the cost of production in Nigeria to higher than normal, reducing returns.

  Therefore, to persuade investors to make multi-decade commitments to Nigeria, the Ministry's proposed investment team[14] will need to lead the creation of enabling conditions for early stage explorers to emerge, and also coordinate with other MDAs and investors to add vital, low cost infrastructure.

- Juniors: To a smaller degree, junior operators experience the same challenges as large scale miners, in addition to facing a number of specific challenges. First, these firms face significant challenges in raising capital. Mining exploration is very expensive and at the same time quite risky. It is not unusual to conduct ten or more exploratory projects for every mining project that is undertaken. Unlike the large-scale miners, junior miners often lack the financial flexibility for these projects as their scale and risk profile usually lock them out of cheaper sources of funds open to their larger counterparts.

- Artisanal and Small Scale Miners (ASM): ASMs in Nigeria suffer from a number of major challenges. First, as it currently exists, artisanal mining in Nigeria is often an illegal and high-risk activity. A number of ASMs usually operate without proper licenses, seek to avoid detection by mining inspectors, and avoid paying taxes. For workers in a typical ASM environment – increasingly women and children – harsh working and living conditions are the norm. Second, unregulated or poorly regulated ASM activities have resulted in significant environmental destruction of previous topsoil, vegetation and animal habitat. Third, due to poor training of many ASM operators, their extraction technologies are dated and result in lower than average yields and cash earnings, reinforcing the cycle of poverty that might have drawn them to mining in the first place.

[14] This team will be discussed in detail in a later chapter

- Logistics (Transport and Handling): The biggest challenge of logistics participants in Nigeria is the lack of infrastructure for moving bulk loads of ore and minerals from ore/mine-site to the refining or processing factory. For local production and beneficiation, this need can be obviated by locating the processing site close to the mine, but for export production, particularly for ore/mineral exports, this becomes a major bottleneck as mines could be located hundreds of kilometres from ports and waterways. Second, beyond transportation, logistics companies also engage in materials handling, a delicate issue since a number of minerals (e.g. uranium ore, gold) need special handling given their value and/or safety risk. At present Nigeria has few ports with limited capacity to handle tons of ore and mineral products for export, which will be a bottleneck as production begins to increase.

- Refiners and Processers: These companies face two main challenges in Nigeria. First, similar to the rest of the industry, infrastructure is insufficient. Mining is a very energy intensive business. A typical smelter, for example, consumes millions of kilowatt-hours of power per year, hence the need to locate near low cost power. Nigeria's grid generates about 6,000MW[15] of electricity, a level that is materially insufficient given industry needs closer to 100,000MW. As a result any company interested in establishing a mine in Nigeria have to build their own power generation infrastructure to support its production, increasing the cost and size of the investments it has to make for a successful operation. Second, scale remains an issue. Scale is generally needed to make the economics of downstream processing work, thus requiring supplies of large amounts of feedstock. Given the limited productivity and dispersed nature of mining activity in the country (limiting the centralisation of processing), this is a challenge that is yet to be overcome.

- Traders: Today, the sector's capacity to conduct trading operations is limited by a number of constraints including the existence of licensed mineral buying centres, a formal and active commodities exchange[16], and a lack of certification / uniform reference standards. These together impact the price discovery process, creating inefficiencies in the market place. The Ministry will need to collaborate with a complex network of partners to create private market mechanisms while the commodity exchange seeks to re-establish itself. In addition, investments into certification processes and standards will help establish standards for improved asset pricing.

Limited Engagement and Leverage of Industry Stakeholders

The sector has a number of stakeholders whose roles are shifting as the sector gains more prominence. Some of these shifts, if not carefully aligned with the needs of the sector, could potentially dissuade investors from the sector. However, a few other shifts could ultimately be for the greater good of the market. The Ministry's convening authority can be a significant tool to overcome the barriers which poor engagement with stakeholders has created to date.

- State Governments: Given the pressure today to boost internally generated revenue (as a result of falling oil prices), more states are looking to mining as a source of additional income. These revenues are shared based on the federal allocation formulas similar to those for earnings from the petroleum sector. However, unlike oil, the total amount of shareable revenues remains low, giving rise to two mistaken beliefs on the part of the states:

[15] South Africa, in comparison, has a generating capacity of about 47,000MW of electricity as of 2015

[16] The Abuja Securities and Commodities Exchange currently exists but does not actively trade metals

- First that the revenues are low because they are not being shared equitably. This is mistaken because the allocation formulas for petroleum revenues and mining revenues are identical.[17]
- Second that greater direct control over mineral resources i.e. "de-listing from the exclusive list" will produce more *immediate* revenue. This is mistaken because such a view will fragment the applicability of the Mining Act (as different states will have differing cadastral authorities), the result of which will be the erosion of investor confidence (given that the industry prizes consistency and scale) and also a repeat of the fiscal errors of the past Nigerian administrations. Barring a constitutional reform that returns all mineral titles to their owners as defined in the 1960 and 1963 Constitutions; such a step cannot be contemplated within the purview of today's Constitution and related laws. Until the 1999 Constitution and the relevant Mining Act is amended, mining will remain the exclusive right, and under the control of, the Federal Government.

Unfortunately, a number of states have tried to use their authorities under the Land Use Act to interfere with legitimate mining decisions made by the MCO and other Ministry agents enforcing the law as it stands today per the provisions of the 1999 Constitution. The main impact such an agitation is having is creating commercial disruption among investors about the continued independence and efficiency of the MCO, its licenses and therefore its regulatory independence, a key driver of investor confidence. The Ministry does not believe that it needs to transfer legal rights and authority as enshrined in the Mining Act to states in order for economic progress to occur. Whether these rights apply to base metal ores, or to industrial minerals such as kaolin or gypsum, the transfer of title issuance rights and control is not the issue.

The real issue at stake however, is whether states are appropriately incentivised to become key influencers (if not a direct economic participants) in how the mining value chain develops within their jurisdictions. Thus, the Ministry supports ideas that seek to incentivise states to champion mining development in their states. Going forward it will work to deepen these incentives and assist the states in creating economic templates for co-investment in mining. States for example can become equity investors in their own right by applying to the MCO for licenses alone, or in partnership with private companies. States do not have a right to block investor access to land or licenses, or interfere with the operations of legitimate miners. Stability of the law, its uniform applicability to all parties, the clarity of the fiscal regime, as well as the regulatory managers is critical to attracting long-term investors into Nigeria.

- Communities*:* Mining is a very environmentally intensive and intrusive activity, with its biggest impact felt by the immediate communities in which it is carried out. Yet in many cases, communities fail to benefit sufficiently from the ongoing activity and instead bear the brunt of the damaging effect of the industry in a number of ways e.g. from pollution, destruction of vegetation and farmland, poor infrastructure among others. In order to avoid the repetition of the challenges seen in the oil industry, it is critical that a mechanism for more engagement with communities throughout the lifecycle of mining activity be established and strengthened. In addition, investors should be actively encouraged to co-invest with communities if possible, or set-up transparent trusts to help communities manage any profit sharing or similar economic returns received.

[17] Mining revenues are distributed by Federation Allocation Accounts Committee (FAAC) in the same way as petroleum revenues, but because they have historically been small, they have largely gone unnoticed in the absolute Naira values of cash distribution.

Finally, federal mining inspectors should ensure operator compliance with key provisions of the Act especially with respect to pollution and remediation.

- Donors and International Agencies: Nigeria has historically engaged with donors, development finance institutions and other international agencies who work in the mining space. While recent progress has been made with respect to engaging in bilateral partnerships with select governments and agencies – e.g. United States, Australia, Canada, Brazil and the World Bank[18] – additional and sustained work is required. Donors and international agencies can be important sources of development financing for early stage activities in mining e.g. via grants, aid flows, low cost loans, advisory services, research, capability building and human capital development. While Nigeria might have been overlooked in the past for a variety of reasons, it is vital that the Ministry now systematically engages that ecosystem once it articulates what its priorities are.

- Professional Associations: Professional associations, especially those that qualify the various professions engaged in the sector (mining engineering, geoscience, etc.) remain the gatekeepers of talent and human capital in the industry. As the industry has gone into decline, the role of the societies have also declined, and a number of issues have emerged.
    - First, fewer people are now admitted to the professional associations due to the limited avenues for education, reducing the pipeline of talent for the sector and ultimately its stability.
    - Second, expertise is less specialised and practical given the lack of hands-on training opportunities available when mines and processing plants are in active operation.
    - Third, some of the training is outdated and needs to be upgraded to reflect advances in knowledge, technology and capabilities since the 1970s.

  The Ministry will need to work closely with the National Universities Commission to expand the capacity of the existing academic programmes to admit students, as well as upgrade the capacity of other providers to offer professional and executive courses. In addition, the Ministry can use the donor coordination mechanism identified earlier to ensure that resilient academic and industry partnership emerges between the Nigerian institutions and key centres of learning in major mining economies.

Poorly Understood Institutions and Limited Enforcement of Regulations

There are a number of issues within this category that need to be addressed in order to improve the long-term performance potential of the sector:

- MSMD's organisational design: The Ministry today is set up as a regulatory and a technical institution organised along a number of directorates, departments and agencies. These units, while established, have long suffered from poor effectiveness in service delivery, due to insufficient tools, skill and funding. In addition, the organisation also lacks a critical third component: a division/department that is dedicated to promoting investment and commercial operations. The absence of such a department means the ministry relies more on external support from other government ministries and agencies in engaging investors. These

[18] Between 2005 and 2012, the World Bank invested in the sector through the Sustainable Management of Mineral Resources Project (SMMRP)

external advisers while well-meaning often lack the relevant content and technical expertise required to effectively advocate for investment.

- Enforcement of existing Laws: The Ministry's track record to date of enforcing minerals and mining laws and regulations has been patchy. Two key institutions – the Mining Police and the Mines Inspectorate – have either not been active or have been under-utilised. As a result, Nigeria has seen a proliferation of illegal miners, including Asian and African illegal immigrants at sites spanning from Osun State in the South West to Zamfara State in the north. The Ministry needs to rebuild the Mining Police[19], and the Mines Inspectorate needs to develop a deeper and more forceful field presence to not only combat poor safety practices at mines, but to require that all operators hold the right license for the activities underway, as well as file regular data reports as required by the law.

- Skills & Capability constraints: The continuing shortage of technical talent within the Ministry is a result of insufficient and focused hiring over the past decade or more. While the ministry has an abundance of administrative talent, there is a shortage of the required technical expertise (e.g., geologists, geophysicists, mining engineers, etc.) for it to effectively develop and enforce some of its supervisory and regulatory duties.

- Coordination with other FGN MDAs: A key element of the Ministry's work requires close coordination with other MDAs. Typical partners will include the Ministry of Environment for EIS, Power for coal to power projects, Finance and CBN for financing ecosystem, and Trade for export market development. However today, no permanent mechanism exists to shape, coordinate and drive such activities. It is essential that at both the ministerial and civil service level, such a mechanism be put in place.

- Clarity in governing laws: Recent disagreements with state governments on the right to issue mining licenses are a clear illustration of how misunderstood the various mining laws and regulations are. The law is clear: mining is the exclusive preserve of the Federal Government of Nigeria. Also, the "first come, first served" and "use it or lose it" principles at the heart of the law is designed to ensure fairness in the administration of the law. The safeguards built into the design of the MCO reinforce the transparency of the process. What needs to be fully clarified in order to avoid unnecessary federal-state competition in the Mining Act and the Land Use Act are any inherent conflicts.

- Fiscal framework: Nigeria faces a major challenge from significant leakages of mining tax and non-tax revenue, and inefficiencies in tax administration. Other issues include overlapping authority and ambiguity in tax regulation and administration and conflicts in fiscal administration of various taxes and levies at the federal, state, and local government levels.

- Leadership instability: The leadership of Nigeria's minerals and mining sector since 1999 has been in a state of constant churn. In fact, the Ministry has been found to have an average of 1 minister and 1 – 2 permanent per year (9 ministers in the last decade). This has cast a pall over efforts to reform the sector, has further tainted the reception of the mining regime, and

[19] The Mining Police historically was an arm of the Nigeria Police Force (NPF) assigned to and trained by the Ministry.

encouraged all kinds of unduly interferences in the mineral title administration and management.

- Environmental sustainability: Today, majority of active mines in Nigeria are manned by artisanal miners who largely operate with limited environmental and safety compliance methods. Their practices involve deforestation, excavation and creation of surface pits especially on farmlands in the various mining communities without any form of environmental rehabilitation. The cost of such practices have been severe: farmland destruction, creation of physical hazards, high levels of toxic chemical usage, and in a number of cases in recent years, death from poisoning.

- Alignment with the African Mining Vision (AMV): Nigeria has operated independent of any clearly identified and formulated plan for the mining industry across Africa, in spite of the many benefits of markets and expert proficiencies that exist across the continent. However following the African Union Assembly's 2009 adoption of the Africa Mining Vision (AMV) as a key continental framework, the need to promote mineral resources-based development and structural transformation on the continent has become clearer. The AMV – if adopted and domesticated – can be a framework tool for Nigeria to harmonise its mining sector with developments, knowledge and capabilities present across Africa.

Deepening a Business Friendly Enabling Environment

While Nigeria has made some progress in terms of becoming a business friendly environment for mining, more work still needs to be done. The 2014 Annual Survey of the Frasier Institute ranked Nigeria as one of the 10 least attractive jurisdictions in the world for mining investment. Below, we highlight a select few areas that continue to act as a drag on growth:

- Capacity Building and Human Capital: Since mining in Nigeria has been dysfunctional for nearly four decades, there is a dearth of human capital and skills in key areas of the sector. The decline of the mining industry has meant that there is virtually a non-existent skills base upon which to build, leading to huge investments in training as well as importation of qualified labor. University curricula have also become outdated, with only two institutions in the country offering mining engineering programmes, and even that only at a general level. Professional associations also have become shells of their former selves and have limited capacity to offer continuous learning and professional development workshops to their members. A combination of a short-term crash talent building programme, combined with a selective influx of outside technical consultants, and a long-term transformation programme for university level technical education will be required.

- Gender Mainstreaming Mining: Historically, women have been subject to gender inequalities and economic marginalisation in the minerals and mining sector. They experience the risks of the sector disproportionality, while men tend to accrue more of the benefits. Women are also more prone to physical and sexual abuse and, in the informal sector, tend to have less secure property and ownership rights than the men. At the decision-making level their involvement also is much lower than it could be, which limits the opportunities for choosing and enacting policies that are in favour of women, furthering the vicious cycle. It is therefore crucial to identify the underlying gender bias in the sector, understand how the gender bias issues affect the minerals and mining sector and how mining activities can benefit men and women more equally.

- Supporting Infrastructure: Nigeria's insufficient infrastructure has long been a bottleneck for economic growth. According to international benchmarks, more developed countries typically have a "core infrastructure" stock (roads, rail, ports, airports, power, water, ICT) equal in value to about 70% of GDP, with power and transportation infrastructure usually accounting for at least half of the total volume. Nigeria's core infrastructure stock is estimated at only 35-40% of GDP. This low value has been driven by historically low public and private spending on infrastructure. While some of these infrastructure is mining specific, mining will benefit from a broad upgrade in the overall quality of economic infrastructure. Coordination with other MDAs, DFIs and private investors will be critical to reducing the need for individual investors to create their own infrastructure.

- Financing and Business Climate: Today Nigeria's banking and shadow finance system has some exposure to mining e.g. financing trading activities for lead-zinc and gold. Production financing however continues to be limited due to the lack of bankable data for exploration. In addition, the sector does not have a systematic understanding of mining's potential and as a result, few banks have dedicated minerals and mining desks and teams. Access to credit either from banks or capital markets has also been low, meaning key capital equipment (such as rigs and draglines) are not financed. As a result, many mining investors push into the ASM sector to keep their capital costs low as well as their risks manageable, which in turn serves to impoverish growth potential. The implication of all this is that mining today is disconnected from the formal financing system reducing the potential for growth. A systematic relationship and knowledge building effort among banks will be required to start transforming the financing environment for mining in Nigeria.

- Security*:* Mining is not immune to the anxieties around security in Nigeria. Whether it is mine site security, logistics related security, general terrorism, kidnapping or basic crime, investors have concerns which the Nigerian state must address. The continued presence of Illegal mining activities in some of the regions, with the attendant risks and community challenges these represent, is a concern that needs to be tackled. Security concerns, therefore, have the potential to discourage investors in the Nigerian mining sector.

Summary

Without question, Nigeria's mining sector faces a range of important challenges. However, these can be solved if a clear plan is articulated and the challenges are addressed within the right strategic framework. In the pages ahead, that strategic framework will be outlined as a first step towards setting out the priority set of actions to tackle the challenges discussed here.

Table 1: Summary of key challenges facing the metals and mining industry

Barrier Type	Severity of the challenge	Summary of Constraints/Challenges
Geosciences	Moderate to High	• Nigeria, despite recent progress, has weak mechanisms for gathering, disseminating and archiving critical geological data required by investors and policy makers
Industry Participants	Moderate to High	• Operators across mining value chain face a range of challenges from insufficient infrastructure to policy uncertainty that together constrain investment confidence

Barrier Type	Severity of the challenge	Summary of Constraints/Challenges
Stakeholders	Moderate	• Decline of industry reduced the focus and leverage of key stakeholders, hence flows into the sector e.g. resources, talent and partnerships have declined
Institutions and Governance	Moderate	• Ministry's own organisational design needs to be refined to ensure clear enforcement of its own rules and separation of powers between the states and the Federal Government
Key Enablers	Moderate to High	• Ancillary requirements for the proper functioning of the minerals and mining ecosystem such as talented labor, infrastructure e.g. railroad, competitive financing systems, mine and asset security, and related support services

Chapter 3 – Proposed Strategic Framework For Full Mining Potential

Overview

Strategy is about making timely and effective choices on what a country or company will focus its business on, and how it intends to excel in its core area of focus. For example, Nigeria can choose to only compete in certain stages of the mining sector value chain because these have the highest profit margins, or it can choose to specialise in certain classes of mineral resources in which it can build global quality scale. No matter the choice made, strategy should emerge from a disciplined choice making process. Based on prior experience, the five key elements to creating an effective strategy are:

- **Ambition**: A bold inspiring state of the full potential goal /end-state we are trying to reach
- **Where to play:** Clear and exclusive choices on areas of focus for the most significant impact
- **How to win**: Critical capabilities and tradeoffs required to win in target markets
- **Prioritised initiatives**: Specific actions and enablers required to execute strategy
- **Roadmap to deliver results:** Plan, timeline and mechanisms to execute, monitor and course correct the strategy

These are illustrated in the image below. Over the next few pages, a pro forma strategic path will be outlined using the framework presented above.

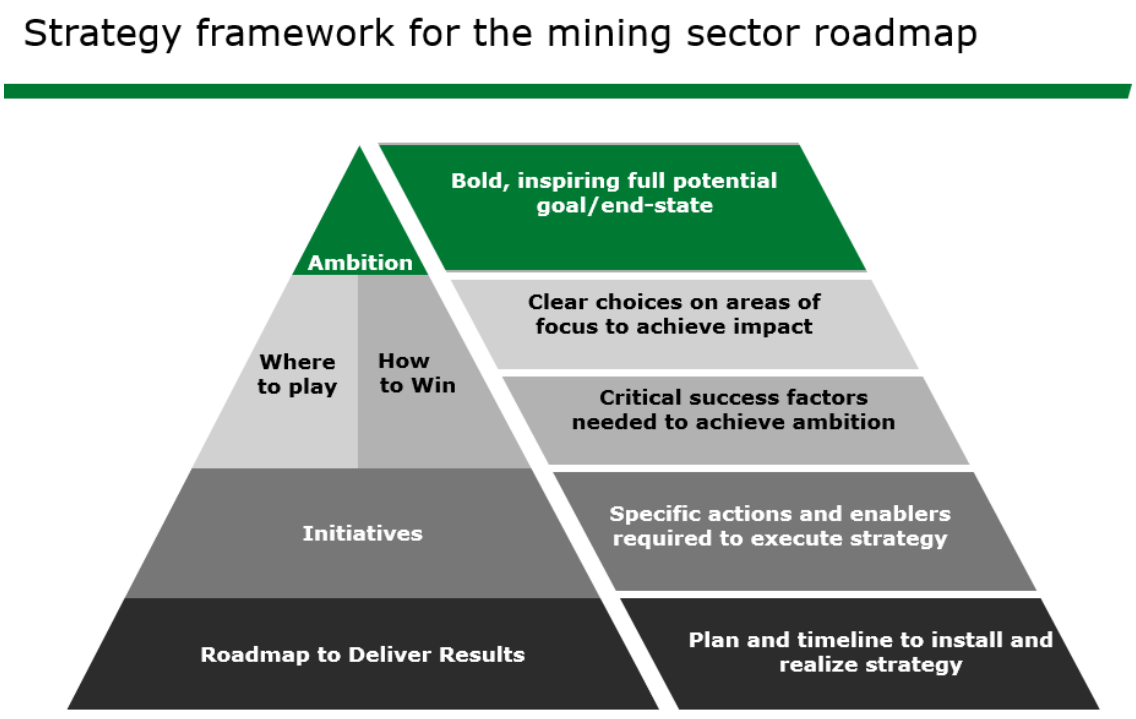


Figure 7: Strategy framework for Mining Roadmap

Ambition – Vision and goals of the roadmap

Nigeria's minerals and mining sector ambition is based on a recognition that Nigeria is working to recover the ground it lost in the past 3 decades due to a policy context that was hostile to business. Therefore, Nigeria's minerals and mining ambition is divided into 3 phases:

- Phase 1: Stabilse the sector and rebuild market confidence (2016 - 2018)
- Phase 2: Establish Nigeria as a competitive African mining and mineral processing centre (2016 - 2020)
- Phase 3: Selectively compete in the global market for refined metals and minerals, in addition to select ore exports (2018 - 2030)

By the end of the Phase 3, it is expected that Nigeria would have built a sustainable, globally competitive mining sector and related processing industries. This revived and expanded industry will seek to prudently use the finite resources available to the country to improve the quality of life for Nigerians, as well as earn a healthy return for investors. This ambition is consistent with the tone set for national development, and is expected to help create the right conditions for minerals and mining succcess over the coming decades. If well executed, this ambition, combined with a realistic plan can unlock value for the Nigerian people, with the potential to contribute to the rest of the economy (through its significant multiplicative effect). We anticipate that by 2025, mining and its related sectors will make a direct and indirect contribution of $27 billion to Nigeria's GDP as illustrated in Figure 9.

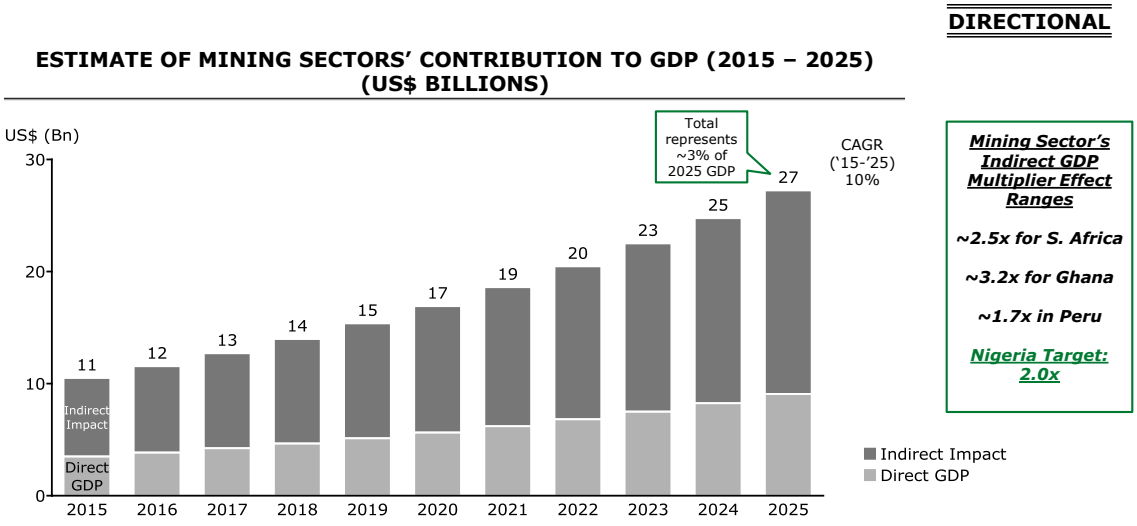
The ambition of the mining sector is focused on long-term value for the Nigerian people

Extraction of maximum value and developmental impact for Nigeria's people from their finite solid mineral resources

Mining is Business, and Government now wants to see more private investors enter the market to drive growth in jobs (directly in mining, and in support of the Mining industry), profits, Forex and tax revenues

Figure 8: Ambition of the Nigerian Mining Sector

Successful execution of a mining plan will unlock significant value for Nigeria



Note: 1. We assume a 10% per annum mining sector growth rate. 2. We assume a conservative 2x multiplier effect for Nigeria. Based on global comparable analysis of mining jurisdictions including South Africa, Ghana and Australia. Mining typically has a 1.5x – 4.0x multiplier effect on related and supporting sectors e.g. chemicals, equipment and services, hence its impact is broader than direct royalty and tax receipts
Source: Facts about mining ins South Africa (South Africa Chamber of Mines, November 2012), The Socio-Economic Impact of Newmont Ghana Gold Limited (Newmont Ghana Gold Limited, June 2011), The economic contribution of large scale gold mining in Peru (World Gold Council, May 2012). South Africa: IDC and Quantec study, Bain Analysis, Federal Ministry of Solid Minerals. Nigeria GDP estimated at ~$600B in 2016 and expected to grow 4% p.a. from 2016 - 2025

Figure 9: The minerals and mining sector can contribute significantly to Nigeria's GDP by 2025

Where to play – Strategic choices for focus

For strategy to be effective, it needs to be focused. Very little is achieved by trying to accomplish too much with limited resources. The same holds true for the Nigerian minerals and mining sector, especially given the infancy of the sector and the many paths it can take in achieving its full potential. The chosen path however can be clarified along a few dimensions each of which is refined through a series of questions to set the stage. **For each dimension below, we present a few illustrative questions with an initial view, based on expertise within the committee, on what a potential answer could look like[20]**.

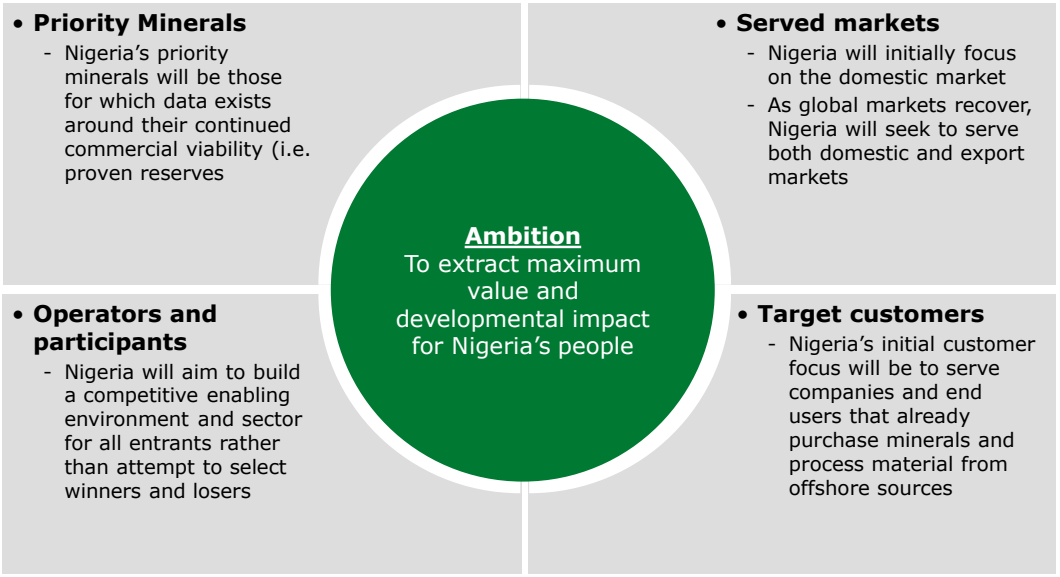
1. **Priority Minerals**: Which minerals should be prioritised for development, and how do we go about determining these? Should the focus be only on minerals resources with commercially proven endowments?
    a. **Nigeria's priority minerals** will be those for which data exists around their continued commercial viability e.g. proven reserves. Based on these criteria, 7 mineral resources have been identified as priorities. These are iron ore, coal, bitumen, limestone, lead/zinc, gold, and barite. These resources are priorities for Nigeria's domestic industrialisation and infrastructure requirements. In addition, the strategy will selectively place emphasis on additional mineral assets that are critical to existing downstream projects e.g. manganese for the steel industry.

[20] The answers presented here **are by no means meant to be definitive** – they only serve as illustrative starting points, based on the expertise within the committee and of the stakeholders consulted. We expect these answers to be further refined as a detailed fact base of the industry is built prior to development of the full strategy.

2. **Served markets**: Which markets should we serve? Should the sector focus solely on export of ores into global markets, or should the focus instead be on domestic processing of intermediate goods for use in local industries e.g. iron ore into steel?
    a. **Nigeria will initially focus on the domestic market** trading ore and processed materials to domestic buyers at a quality level comparable to imported materials. Processing ores and other minerals i.e. beneficiation into a material that is useful to the Nigerian and African industry is a vital element of the strategy. This approach is designed to win market share from imports.
    b. **As global commodity markets recover, Nigeria will then seek to serve both domestic and export markets**. The initial market focus will be on serving domestic industrial and end user markets.
    c. **Nigeria will also seek to exploit its mineral assets in such a way as to preserve and extend the life of its holdings** for future generations and manage cash earnings carefully[21]. This will require a careful licensing regime at the MCO that corresponds to the overall sustainability agenda.
3. **Potential Operators/Participants**: What kind of operators/participants should we primarily engage for development? Should we pursue the international majors and pursue scale output as quickly as possible, or should we aim for junior miners and ASMs, which will over time build the local capacity and increase employment opportunities for Nigerians?
    a. **Nigeria will focus on building a competitive enabling environment and sector for all entrants**, rather than attempt to select winners and losers. While an explicit bias will be in place to encourage formalisation of artisanal miners, the broader goal is to encourage a competitive industry structure.
4. **Target Customers:** Will our primary customers be basic industries, interested largely in ores and lightly processed minerals, or will targeting a more beneficiation focused market be key to growth?
    a. **Nigeria's initial customer focus is to serve companies and end users that already purchase minerals and process material from offshore sources**. These will include customers in the cement, oil, power and industrial sectors. For example, substituting imports of coal with domestically sourced coal would be illustrative of such a step.

[21] Mining assets are not-renewable and as such need to be managed appropriately to ensure that their benefits last as long as possible

Four focus areas comprise Nigeria's mining strategy and revolve around its ambition



Note: The particulars of the focus areas provided are preliminary; they are expected to evolve as a more detailed strategy is built from a more comprehensive industry factbase

Figure 10: Focus areas of Nigeria's mining strategy

In the course of addressing these questions, a few things should be noted:

- First, these questions are interconnected i.e., each has some implications for the others and these have to be considered together holistically to build an effective strategy.
- Second, the strategy does not have to be rigid but should be adapted as the industry matures and external conditions change. For example, a country that initially chose to serve an export market might find that it has to focus on its internal market as export prices have fallen significantly for commodities over the past few years, limiting the returns it can get.
- Finally, existing strengths and opportunities should be leveraged in selecting the options to pursue. For example, it will make sense to prioritise minerals for which there is already existing production capacity/demand in the country over another that lacks it.

How to Win – 8 Critical Levers For Success

Once the ambition is set, and the areas of focus for the strategy have been determined, the next task is deciding what key levers need to be pulled, and what capabilities need to be developed to ensure success? We have identified a set of critical levers that the Nigerian government can put in place to improve the ecosystem for the minerals and mining sector. These are summarised below:

1. Integrated Strategy, Proactively Communicated: Success in mining will require that Nigeria as a society is aligned on the plan and its implementation. Therefore, the Federal Government, upon finalising the mining Roadmap, should invest significantly in communicating the key elements of the plan. This will require coordination with other branches of government, community activists,

professional societies, investors, etc. The more clearly key partners understand the plan across Nigeria, the more likely it is that various stakeholders will champion it.

2. Investor Friendly Regulatory Environment: Historically, after the shift to a state-led mining development model, Nigeria began to neglect the investor friendliness of its mining sector. The net result was a system that focused on technical reform and regulatory action but not necessarily stronger participation by the investor community. Going forward, mining in Nigeria requires a strong focus on private investors and the regulatory regimes such that an investor will value. That will mean conducting reviews of existing tax systems, licensing fees and the various fee schedules charged by mining related MDAs.

3. Coordinated Infrastructure Investments: To unlock mining's full value chain potential in Nigeria, significant infrastructure investments will be necessary. This will include power plant, railroads, water processing plants, roads and port handling systems necessary to enable boosts in mining output. Delivering on these investments will require public and private investors to cooperate. A failure to take proper action and structure these capital investments appropriately will mean that the growth rate of the minerals and mining sector will be constrained, investor commitments will fall off, and the sector will fail to live up to its full potential.

4. Community Partnership: Success in Nigerian mining requires partnership across multiple communities, stakeholders and institutions. For example, the role of state governments as both co-investors and sector champions is critical, as is the role of communities that choose to set up investment vehicles. In fact, the Mining Act already makes provision for communities to be accorded a clear co-investor status in the development of mineral assets, a step that helps align the interests of all key parties to a transaction. It is vital that as the Federal Government continues to experiment with new mechanisms for enlisting public support to grow minerals and mining, it should ensure that such actions benefit a multitude of stakeholders in the sector. Only through government innovations and partner action e.g. community engagement mechanisms, shared investment and co-creation of opportunities, can a sustainable growth model be found for the sector.

5. Investment Funding: The high risk allocation in the early-phase of mining projects means that activities such as exploration and ore reserve estimation have the most difficulty in obtaining funding from standard project finance sources. The further advanced the project, with feasibility studies conducted and project plans defined, the more flexible the funding options. The risks at the beginning are highest and decline over the course of the project[22]. Therefore, given the nascent stage of the Nigerian mining sector, many of the projects are characterised as early stage projects, which will therefore require specialised financing options. Furthermore, as a growing number of the mineral basins are developed, exploration activities are increasingly driven to frontier and remote geographies, which typically result in more expensive exploration programmes.

[22] Detailed discussion of risks and funding for exploration and production in mining is given in the appendix

The Solid Minerals Development Fund (SMDF) envisioned in the Mining Act therefore needs to be operationalized and made available under well-defined terms to help de-risk activities in the sector. The Ministry will in 2016 move rapidly to work closely with the Central Bank and related institutions to give form to the provisions of the law. Beyond that statutorily provided for fund, the Ministry intends to work with private investors to further de-risk and expand the sources of financing for the sector. For example, the SMDF can leverage its balance sheet to catalyse the emergence of a financing ecosystem that includes financial instruments such as equity, convertible debt or structured credit products which provide cost competitive working capital for miners. The Ministry anticipates that the various initiatives that will emerge from financial sponsors and other market actors will receive a measure of support from the SMDF so as to broaden their capacity to support both exploration and development activities. Note that the activities of the Ministry in funding both exploration and production does not preclude other parties e.g. state governments who also want to co-finance such activities in equity partnership with private investors.

6. Institutional Reform: Nigeria has relatively strong institutions in mining but many of these still require some work e.g. the state level MIREMCOs. Certain principles need to be entrenched in the operating philosophy of the industry such as transparency and accountability in the allocation of rights, analysis of social, economic, and environmental impact of investments. Other themes include disclosure of “plain English” financial costs and public access to information on the procedures and operations of both public and private institutions. In allocating rights, either for “first-come, first-serve” or competitive bidding, clear and transparent procedures for the award, terms, and conditions of mineral rights will be enhanced. The government intends to use the proposed bitumen licensing round in 2016 / 2017 to illustrate a number of these themes and set a behavioural baseline for the sector. This will increase competition among potential investors in the award of licenses. Capacity of public authorities to oversee all the processes and make their own independent assessments will be a priority, given the critical nature of transparency for market success.

Figure 11: Eight critical factors are needed for the success of the Nigerian mining sector

7. Geo-scientific Value Add: Geoscience is the backbone of all mining ecosystems and Nigeria is no different. Nigeria's priority should be to build a compelling geo-scientific picture of what mineral endowments the country has, as a first step to conclusively establishing modern reserves. However, given the scale of geological data that needs to be collected, processed, analyzed and used to drive investment decision-making and public policy, the Government of Nigeria is not in a position to do so alone. Therefore, it is vital that going forward, government, industry, professional associations, and key technical agencies (domestic and foreign) work closely together to align on geo-scientific data collection. The recommended approach should be one that prioritises building a well-informed sector over the limited cash earnings from resale of certain classes of exploratory data.

8. Mining as Development Catalyst: Mining can be a significant catalyst for building non-mining skills and capabilities in communities that are host to mining companies and operations. It is vital that the Federal Government and its key partners work alongside communities to create economic diversification within such communities. As such, training programmes that enable talented young men and women to gain a range of skills including those in agribusiness and management of SMEs will be key for the long-term economic viability of many future mining communities. Combined with careful stewardship of royalties from mining in such communities, the temporary exploitation of mineral assets can provide the venture finance to help build a more sustainable long-term economic base in the community in question.

In the document appendix are examples of how other countries have used similar levers to improve the competitiveness of their mining sector.

Initiatives and Implementation – Action steps to drive change

After the critical success factors to win have been established, a series of preliminary concrete and actionable initiatives need to be identified to realise these objectives. Six categories of initiatives have been identified as necessary to deliver the strategy. These align with the approach with which the sector's challenges and constraints have been defined:

- Priority minerals
- Institutions and Governance
- Stakeholders
- Operators
- Geosciences
- Enabling environment

Note however that not all the outlined initiatives can (or need) to be achieved immediately. Effective implementation rests on the ability to phase execution to align with resource availability and team capacity. Based on that, we have built an execution timeframe into the roadmap as follows:

- **Immediate**: Initiatives that need to begin right away. They are expected to be initiated starting in June 2016 onwards
- **Short-term**: Initiatives between the first 6 months and 2 years of the plan going into effect
- **Medium-term**: Initiatives that are expected to start between 2 and 5 years of the plan
- **Long-term**: Between years 5 and 10 of the plan
- **Ongoing**: Initiatives that span the lifetime of the plan and will be revisited

These initiatives, together with their outcomes are outlined in the figure below and will be discussed in detail in the next chapter.

Summary

For the roadmap to be effective, it needs to be embedded in a long-term strategy for growth and development of the sector. Elements of this strategy include an ambition/vision of where the sector is headed, an understanding of the areas to focus our efforts for maximum impact, a knowledge of the key capabilities to be developed to sustain the strategy, and ultimately a set of initiatives and an implementation plan for bringing the strategy to life. It is this implementation plan that is the focus of our next chapter.

Timeline of key action items for executing the roadmap

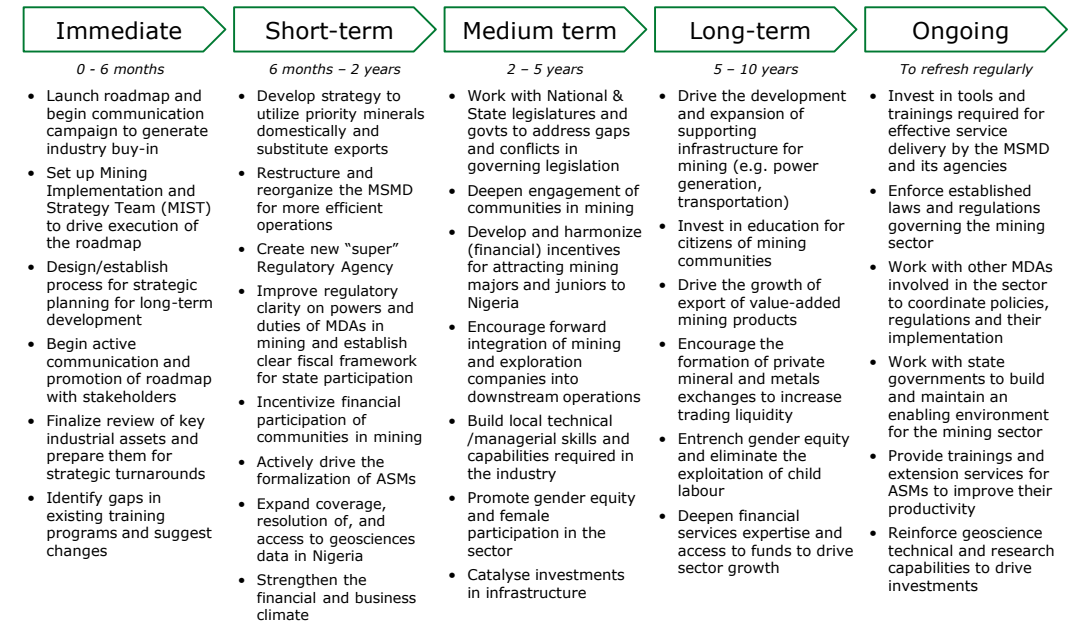


Figure 12: Timeline of key action items for executing the roadmap

Chapter 4 – Implementation and Action Plan

Overview

To bring the strategy described in the previous chapter to life, a set of initiatives have been identified for implementation. Each of these initiatives is described along the following dimensions:

- **Objectives:** Focus areas within each hindrance category that highlight the overall thrust of a set of related initiatives
- **Owners:** Those with primary responsibility for implementing these initiatives
- **Phasing/Timelines to completion:** Preliminary timescales attached to the implementation of these initiatives. These are split into 5 groups:
    a. *Immediate* initiatives are those expected to be completed between now and 6 months of the plan being in place
    b. *Short-term initiatives* will be completed between 6 months and 2 years of the plan
    c. *Medium-term initiatives* are expected to be completed between 2 and 5 years
    d. *Long-term initiatives* expected between 5 and 10 years of the plan
    e. *Ongoing initiatives* are those expected to be periodically carried out throughout the entire lifetime of the plan in intervals as required by the particular initiative

Furthermore, a set of governance options have been outlined for the Ministry to consider for managing the implementation of all the initiatives, and aligning with the different actors to ensure that progress is uniform and coordinated across the board.

Objectives

The initiatives outlined were designed to address the key challenges that were identified in chapter 2 and also explicitly detail a strategy for the near term for the industrial and energy mineral, and the steel sector. Within each category, a set of objectives were identified as core to overcoming the stated challenges and these are outlined as follows:

- **Priority Minerals & Steel**:
    - *Developing an industrial minerals strategy* to boost the local economy through beneficiation and utilisation of domestic minerals
    - *Developing an energy minerals strategy* for domestic use and industrial power generation using Nigerian coal resources
    - *Developing the steel sector* to provide a solid backbone for the manufacturing and industrial economy
- **Institutions and Governance**:
    - *Building the organisational and functional capabilities of the supervising Ministry*
    - *Creating a unified regulatory function that combines the current roles of the Mining Cadstre, Inspectorate and Environmental compliance functions*
    - *Building a stronger regulatory framework for the industry* by
        - Resolving regulatory conflicts in the existing legal and regulatory framework of the industry
        - Improving policy consistency and direction
        - Improving the environmental sustainability of the industry
        - Improving enforcement of existing regulations

- *Ensuring stronger economic and political coordination of minerals and mining policy in Nigeria*

- **Stakeholder Engagement:**
  - *Improving the engagement of states with the minerals and mining sector*, particularly around financial participation and revenue sharing, and coordinating oversight with the federal ministry
  - *Improving the engagement of communities* through coordination of corporate social responsibilities, incentivised participation, and education

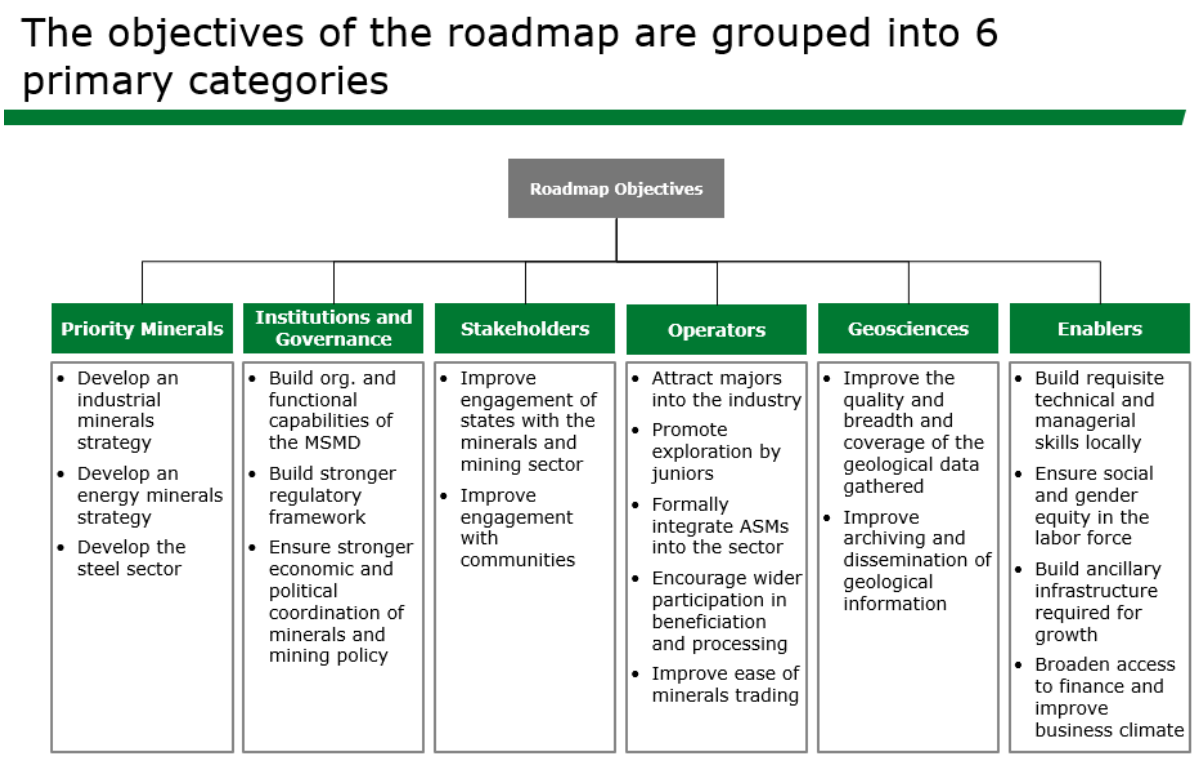


Figure 13: Objectives of the Roadmap

- **Industry participants**:
  - *Attracting majors into the industry* by stabilising long-term minerals and mining policy and incentivising investments in large-scale mining equipment and infrastructure
  - *Promoting junior explorers* through sustaining favourable enabling environment for attracting high risk exploration investments
  - *Promoting formal small scale operators through* expanding access to funding and supporting knowledge development to drive local content
  - *Effectively monitoring and regulating informal and/or illegal mining operations*
  - *Encouraging wider participation in beneficiation and downstream processing and refining* through incentivising forward integration by existing participants
  - *Improving trading and the ease of transactions* through the set-up and formalisation of metal exchanges and mineral certification authorities
- **Geosciences data and information:**
  - *Improving the quality and breadth of geo-scientific data gathered* in a cost-efficient manner that will adequately drive investment growth

- *Adequately archiving and disseminating the information gathered in modern formats* to ensure ready accessibility to investors and other interested parties

- **Enabling environment:**
  - *Building the required technical and managerial skills and capabilities locally* to ensure the supply of steady talent required by the sector in the future
  - *Ensuring social equity in the labour force* by addressing issues of exploitation of women and children
  - *Creating the necessary ancillary infrastructure to accelerate growth of the sector* nationally and regionally
  - *Broadening access to finance and improving business climate in Nigeria* to increase attractiveness of (foreign) investments in the sector

Owners

For each of the initiatives that were identified in the document, a set of owners were assigned who are believed to be best positioned to execute the initiatives independently or to coordinate with the MSMD in their implementation. The principal actors and a summary of the roles they are expected to play in the execution of the initiatives are summarised below[23]:

- **Ministry of Solid Minerals Development**: The MSMD is the principal owner and guardian of the initiatives outlined in the report and is either at the core or a key contributor to every initiative. It is primarily expected to lead and coordinate the timely execution of these initiatives, and ensure that this is done in harmony with the objectives of the roadmap. Furthermore it will manage all budgetary allocations (at the Federal level) that are earmarked for these initiatives

- **Executive Council of the Federation**: As the governing, operating and senior executive council of the country and the oversight board for the MSMD, the EXCOF will largely be expected to provide strategic oversight and approval for the roadmap and engage in driving some of the national level initiatives where the MSMD might have limited reach. It should lend its political clout and backing to ensure that these initiatives receive timely attention from the required quarters and their implementation is not delayed or derailed by political self-interest of other players

- **National Assembly and State Legislatures**: As the governing legislative body in the country and in each state, respectively, they are expected to work with the MSMD on the initiatives related to the legislation and regulations guiding the minerals and mining industry in their respective jurisdictions (e.g. fiscal framework, regulatory harmonisation, etc.)

- **Other Ministries and Agencies**: They are expected to coordinate with the MSMD specifically on initiatives that impact activities in their particular ministry and the minerals and mining

[23] This list is not comprehensive. The MSMD is expected to update with additional, relevant partners that they identify in the course of executing the initiatives

sector. For example, the Ministry of Environment (MoE) is expected to coordinate with the MSMD on environmental compliance related initiatives, while the Ministry of Power, Works and Housing is expected to coordinate on the development of enabling infrastructure. Other Ministries and agencies include the Ministry of Finance and the Central Bank of Nigeria, which are expected to coordinate on financing and revenue related initiatives. It should be noted that the agencies identified in the initiatives are only preliminary – the MSMD is expected to liaise with any additional ministries that it deems to be critical to execute the selected initiatives.

- **Professional Associations and Civil Societies**: As technical and knowledge experts in the minerals and mining sector, they are expected to work with the MSMD, proffering solutions for implementing the technical and geoscience initiatives as well as for skill acquisition and capability building

- **Law Enforcement Agencies:** The Nigeria Police, Army, Ministry of Interior entities e.g. Civil Defense, and the Department of State Services will be expected to own and coordinate the enforcement of policies and regulations of the minerals and mining sector, as ratified by the National Assembly. They will also be heavily involved in the support, training and staffing of specialised units and task forces (e.g. The Mining Police and the Mines Inspectorate) within the MSMD

Prioritisation and phasing

While all the initiatives are important and ultimately critical to achieve the goals for the sector, to effectively manage and implement them, it will be necessary to phase them into horizons. As outlined in the introduction, the time-horizon for the initiatives that have been structured into 5 phases. These are:

- **Immediate**: Initiatives that need to begin right away. They are expected to be initiated starting in June 2016 onwards
- **Short-term**: Initiatives between the first 6 months and 2 years of the plan going into effect
- **Medium-term**: Initiatives that are expected to start between 2 and 5 years of the plan
- **Long-term**: Between years 5 and 10 of the plan
- **Ongoing**: Initiatives that span the lifetime of the plan and may be revisited

Assignment of initiatives to each of these phases were guided by the consideration of a few broad characteristics: speed to realisation (quick wins), expected impact on the sector, degree of (political) coordination required and estimated cost of implementation.

Table 2: Initiatives for boosting minerals and steel production

Category	Initiative	Owner	Timeline

Development of Industrial Minerals Strategy	• Develop and implement a strategy to utilise domestic supply of minerals in the local economy
	  ○ Build a fact base of the supply-demand gaps of key industrial minerals
	  ○ Understand the technical quality and volume required by the principal end users
	  ○ Evaluate potential sources for satisfying demand and facilitate the entry of private investors to fulfil this
	  ○ Support the entry of private investors (domestic and foreign) that will drive mineral beneficiation to serve domestic market demand, and subsequently export market's
	  ○ Align policy regarding waivers, tariffs and imports to provide smart growth support to domestic processors
		MSMD
		Chambers of Commerce/Manufacturing Association of Nigeria
		Miners Association of Nigeria
		Financial sponsors
		Private investors
		Nigeria Customs Service
		MITI
		MoF
			Ongoing
			Short-term

Development of Energy minerals	• Develop a strategy for the utilisation of Nigerian coal assets for power generation and domestic energy use (e.g. briquettes as cooking fuel to replace firewood)	MSMD Ministry of Power	Short-term
	• Design and launch a bitumen block allocation round • Develop a strategy for using parts of bitumen belt to produce materials for road construction	MSMD Ministry of Works	Short-term
	• Develop other parts of the bitumen belt for energy production	MSMD Ministry of Petroleum Resources	Short-term
Development and Realisation of the Steel Sector	• Finalise the review of existing industrial assets controlled by the Federal Government, and work to ensure full production at these companies ○ Design process and criteria for evaluating and selecting potential investor and private-sector partners	MSMD	Immediate Short-term

Category	Initiative	Owner	Timeline
	○ Engage the President on signing the Nigerian Metallurgical Industry Bill ○ Expand capacity of NSRMEA and NMDC to conduct focused research to understand supply for key raw materials to the sector		

Table 3: Initiatives to address challenges faced by Institutions and Governance

Category	Initiative	Owner	Timeline
Ministry Re-organisation and Capability building	• Review and implement as appropriate, existing institutional assessment of the MSMD and affiliated agencies ○ Consolidate certain (administrative) operations across multiple departments to make structure leaner ○ Create new units to drive strategic and priority agendas of the MSMD (e.g. investments promotions, initiatives oversight) ○ Review the functions of the existing Mining Cadastre, Inspectorate and Environmental Compliance to improve performance	MSMD External consultants and partners	Short-term
	• Invest in information technology to improve MCO and field operations ○ Ensure full automation of MCO mineral title administration and processes; previous and future records will be made searchable ○ Establish zonal offices for the MCO with centralised processing of applications ○ Establish a window for electronic record sharing by the State Governments, the Joint Tax Board, State Revenue Boards, FIRS, NCS and other relevant fiscal authorities for their access ▪ Records will also include updates for new licenses and titles issued by state	MSMD	Immediate to Short-term

Category	Initiative	Owner	Timeline
	▪ Harmonise records of registered mining value chain participants to ensure clarity on economic and operational status e.g. active / inactive ○ Digitising and web-enabling records of mining titles and registries ○ Introduce cloud-based storage and backup solutions to ensure security of mining titles ownership		
	• Invest in tools required for field inspection and monitoring ○ Purchase technical and logistics equipment for ease of mobility and in-field analysis	MSMD	Immediate Ongoing
	• Strengthen the key technical departments in the Ministry for increased effectiveness in executing their mandated duties ○ Expand funding, add staff and upgrade training	MSMD	Immediate Ongoing
	• Commence deployment of interdepartmental MSMD teams at the state level to ensure full collaboration on operational issues e.g., teams made up of inspectors, ASM, MIREMCO officials etc. • Expand opportunities for professional development and training of staff including rotation options to broaden skill base of employees	MSMD	Ongoing
Regulatory Clarity	• Create a new super Mining Regulatory Agency that combines and merges current Mining Cadastre, Mines Inspectorate, and Mines Environmental Compliance functions • Clarify the separation of powers between the minister and the Mining Cadastre Office (MCO) • Clarify and resolve conflicts in legislation between MSMD and other MDAs e.g. MEC and Ministry of Environment, Inland Waterways, etc. • Amend Section 100 of the Mining Act to reflect the realities of the current consent process (e.g. changing language of ownership and consent)) • Amend the Explosives Act to reflect industry's evolution to date and ensure safety and quality of mining operations	MSMD	Short-term
Coordination with State Governments	• Work with the National Assembly and the representatives of the state governments to address gaps between the Mining Act and the Land Use Act	MSMD	Medium-term

Category	Initiative	Owner	Timeline

	• Coordinate to expand the provision of essential services including extension of mine safety/environmental services and related support to mining companies and communities
	• Intensify education and engagement with state governments on key provisions of the Mining Act
	  ○ Reconstitute, fund and leverage Mineral Resources and Environmental Management Committee (MIREMCO) across the 36 states and the FCT to implement this goal
	  ○ Encourage states to align their mining related activities e.g. sharing of geosciences data gathering with the NGSA to ensure that complete and comprehensive asset databases are created
	  ○ Enforce provisions against illegal mining and theft of public resources
		National and state legislatures
		State govts.	

Refine Fiscal Participation Framework	• Facilitate the rapid passage of the new Mining Tax Act, which among other things should:
	  - Decrease the overall number of payments and collection organisations
	  - Eliminate loopholes/systems that encourage multiple taxation (i.e. illegal state taxes)
	  - Introduce one-stop-shop system within the national and state agencies for ease of tax collection and reporting
		MSMD
		National Assembly
		Ministry of Finance
			Short-term

	• Promote transparency and accountability in revenue sharing across federal, state and local government
	  - E.g. appropriately classify and report mining revenues and taxes paid by companies in the sector to FIRS
	  - Clarify and intensify the role of Joint Tax Board in mining activities
		Ministry of Finance
		MSMD
		FAAC
		FIRS
		NEITI
			Short-medium term

Category	Initiative	Owner	Timeline

	• Improve revenue collection by developing the capabilities and capacity of government agencies to monitor and audit mining companies
	  - Create special teams and/or divisions in the revenue agencies dedicated to the minerals and mining sector
	  - Offer new trainings and specialised accreditation (where needed) for mining accounting professionals alongside the relevant Chartered Institutes (tax and accounting)
	• Support State Governments to effectively collect the 19% due as Personal Income Tax from mining operators
	  - Create a clear mechanism for fiscal collaboration and data sharing between MSMD/FGN and States to ensure accurate reporting of production levels, and levying thereof of appropriate taxes, levies and other charges permitted by law
		MSMD
		FIRS
		Customs
		Professional organisations
			Short-medium term

Improve Policy Consistency and Direction	• Design a clear process for future strategic planning for long-term development of the sector • Leverage Annual Stakeholders session to engage with the industry and stakeholders on mining sector policy reform • Meet every 6 months with the Federal Ministry of Budget & Planning to ensure key mining concerns are reflected in the federal budget as well as in the national plans e.g. Medium-term Framework	MSMD MoBNP Other relevant ministries	Immediate
	• Implement an effective communication strategy with all stakeholders to ensure buy-in across the industry, making the plan less likely to change • Set up dedicated communication council • Review potential names for the ministry to reflect the appropriate nomenclature of the sector	MSMD	Immediate

Category	Initiative	Owner	Timeline
	• Set up a dynamic process and a team that owns and manages the roadmap and updates it to reflect current realities	Executive Council of the Federation MSMD	Immediate
Improve Environmental Sustainability	• Enforce provisions of the Mining Act and other applicable federal laws regarding the conduct of environmental impact assessment and surveys • Ensure implementation of the approved framework to establish the Environmental Protection and Rehabilitation Fund • Enforce contributions to the Fund to ensure adequate provisions for addressing environmental remediation • Provide sufficient funding to address legacy issues arising from previous environmental damage from illegal mining activity while intensifying efforts to prevent future occurrence • Align MCO's licensing activities with strategic infrastructure, government assets and key environmental properties; for example, historic buildings, prisons, government buildings, national parks, and other areas with sensitive ecosystems will be off-limits for mining	MSMD State Govts. Ministry of Environment	Short-term to medium-term
	• Streamline roles and responsibilities of different regulators involved in the environmental impact of the mining sector - In the interim, MSMD should continue to pursue joint approvals of EIAs with the Ministry of Environment - In the short-term, EIA approvals in mining should be considered for domiciliation within the MSMD (clarify sections 71 and 119 of the Mining Act) - Costs for EIA should be reviewed and restructured to be proportional to mining investments - Fund MIREMCO to ensure effective oversight and management of environmental responsibilities at the state level	Executive Council of the Federation Ministry of Environment MSMD	Short-term Ongoing

Category	Initiative	Owner	Timeline
Improve Regulatory Enforcement	• Re-introduce and revamp specialised enforcement units within the MSMD such as the Mines Field Police and the Special Mines Surveillance Taskforce for increased efficiency - Integrate Customs and Ministry of Interior task forces into enforcement mechanism to ensure effective policing of mine sites and mineral exports to prevent under-reporting and avoidance of royalties - Launch enforcement raids on illegal mine sites and misapplication of licenses • Enforce regulations around safe operations of mines and mineral processing complexes	MSMD Nigeria Police Nigeria Army MoI (Civil Defence) Customs DSS	Short-term
	• Establish proper accountabilities with checks and balances within the enforcement units to ensure their integrity - Incorporate randomised audits and spot checks (in the field) of the enforcement units performance - Introduce and enforce formal reviews and appraisals of officers	MSMD	Medium-term
	• Strengthen penalties and fines within the Mining act and other relevant regulations to ensure that they act as proper deterrents	National Assembly State legislatures MSMD	Short-medium term
Economic and Political Coordination of Mining Policy	• Establish semi-annual fora for engaging the key decision-making agencies and parastatals with ministries (and professional bodies) whose operations overlap with mining • Sponsor an annual **Mining Stakeholders Forum** to serve as a key commercial platform for all parties in the sector to meet, share progress reports, exhibit innovations, debate policy, and ensure alignment	MSMD MOE EXCOF State Governments Value chain participants	Short-term

Table 4: Initiatives to address challenges faced by key stakeholders

Category	Initiative	Owner	Timeline
Refocus States Engagement with Mining Sector	• Work with the states to build an enabling environment for mineral exploration and exploitation and promote their jurisdictions as mining destinations. For example: - Customize incentives focused on minerals prevalent in their states - Accelerate approvals from land-owners for exploration licenses, and set up specialised funds for co-investment in mining activity	MSMD State govts. and legislatures National Assembly Ministry of Justice FAAC/EXCOF	Ongoing
	• Encourage coordination with MIREMCO to encourage compliance of mineral title holders within their jurisdiction - Help enforce the "use it or lose it" principle for mining - Discourage setting up parallel licensing offices - Transform collaboration to focus on upfront environmental remediation planning and management of resources	MSMD State govts. and legislatures	Short-term
	• Support states on best practices for financial participation in the mining sector in a manner that they do not crowd out private-sector investments - Set-up and register with the Corporate Affairs Commission a state controlled mining company - Constitute the Board of such state companies and provide appropriate equity capital to support their activities - Pass and sign any required enabling Act to govern the activities of any such company, including its access to existing geological surveys conducted, or exploit mining licenses transferred to it	MSMD State govts. and legislatures	Short-term

Category	Initiative	Owner	Timeline
	- Review the necessity of a mining Ministry and where possible streamline the functioning of such entities and optimise coordination with MSMD		
	• Partner with States to refine and clarify key fiscal rights e.g. taxes that are due to the States but not reported today, remain uncollected, or not discussed - Set-up a formal data exchange mechanism between States and MSMD to ensure a clear reporting of activities to ensure that an appropriate basis for taxation is clear; leverage mechanism of Joint Tax Board - Engage National Assembly and FAAC on applicability of the 13% mineral derivation rules to mining assets; if applicable, ensure states receive appropriate cash transfers - Review the Surface rent rates and adjust upwards as appropriate; discuss rationale, timing and other considerations with States	MSMD State govts. and legislatures FIRS/Joint Tax Board FAAC	Short-term
Improve Communities Upside and Engagement	• Educate companies about their obligations to communities under the Community Development Agreement (CDA) • Facilitate negotiations between mining companies and host communities on CDAs	MSMD Communities State and Local govts. Mining companies	Medium-term
	○ Provide market-based incentives for indigenous and community participation in commercial exploitation of minerals - Support communities in the formation of special purpose vehicles (SPVs) for mining investments e.g. 7.5% - 10% equity share in projects in return for consent	MSMD Communities Financial institutions	Short-term

Category	Initiative	Owner	Timeline
	- Partnership with communities to set-up CDA Trusts to oversee effective governance and use of the proceeds from SPVs / equity co-investments - Leverage of tax credits, equity contributions and access to low interest loans to encourage the growth of the sector		
	• Revamp the process for obtaining consent from communities in Nigeria: - Ensure principle of "first come first serve" is honored and punish discriminatory / bad faith practices e.g. arbitrary withdrawals of consent, multiple consent approvals to the same titled land, etc. - Intensify education of the communities (and state governments) about their rights and responsibilities in the consent process	MSMD/MCO State and Local govts.	Medium-term
	• Improve education by designing plans for communities to sponsor and encourage their indigenes in education/professions relevant to mining e.g. geosciences, law, finance	MSMD Communities State and Local govts. Universities	Long-term

Table 5: Initiatives to address challenges faced by industry participants

Category	Initiative	Owner	Timeline
Majors	• Consistent implementation of the mining policy to attract investments to the sector by:	Govt. MSMD	Short-term

Category	Initiative	Owner	Timeline
	- Ensuring commitments to the sector are specific and binding, with publicly accountable timelines - Being aggressive about communicating these commitments through		
	• Provide incentives for mining-related infrastructure and equipment investments	National Assembly Federal Govt. MSMD	Medium-term
Juniors	• Work with key financial partners (CBN, Ministry of Finance, SEC, and NSE) to create an ecosystem that is supportive of exploration finance	Central Bank Private-sector investors SEC	Short-medium term
ASMs	• Continue to incentivise and support the formalisation of Artisanal miners into cooperatives • Continue to support the growth and transformation of small scale miners into larger enterprises	MSMD Mining Association	Short-term
	• Facilitate expansion of equipment leasing companies into specialised mining equipment • Support financial institutions to developed associated financing with equipment companies • Leverage SMDF mechanism to support equipment financing at competitive interest and related terms	MSMD Central Bank Equipment Leasing Association	Short-term
	• Provide extension service and training programmes to ASMs with strong emphasis on technical skill development, environmental protection and sustainable business management • Expand financial access to available funds such as the MSME fund and the Bank of Industry	MSMD Central Bank	Ongoing

Category	Initiative	Owner	Timeline
	• Partner with ministries to provide counselling and health care services to address social issues predominant among the artisanal miners such as drug addiction, HIV prevalence, physical and sexual violence etc. - Encourage the set-up of primary health care centres and mobile clinics in areas with large concentrations of ASMs - Train extension service workers to also provide basic primary care services to ASMs	State and Local ministries of health MSMD	Short-term
Refiners and Processors	• Support the establishment of mineral processing centres by private investors for value-addition • Encourage forward integration of existing mining/exploration firms into downstream operations through appropriate incentives e.g. - Raise import tariffs and levies on refined products for which raw materials are abundant in Nigeria to encourage local production - Export subsidies and tax credits to accelerate production for global markets	MITI MSMD	Medium-long-term
Traders	• Encourage the formation of private minerals and metal exchange(s) to increase liquidity of the metal trading, manage risk and facilitate the efficiency of the trading markets	MITI MSMD NSE FMDQ	Long-term
	• Establish formal minerals certification authorities/bureaus to standardise quality across industry and facilitate much faster (and reliable) trading)	MSMD	Short-term
	• Create policies and guidelines for metal and minerals trading in Nigeria	MSMD	Short-term

Table 6: Initiatives to address challenges to building a strong Geosciences base

Category	Initiative	Owner	Timeline
Data Gathering and Analysis	• Complete payment and secure release of all open geosciences data projects in Nigeria • Expand coverage and resolution of geoscience data in Nigeria to further stimulate an adequate level of mineral exploration and discovery • Accelerate the production of 1:100,000 and 1:50,000 maps of Nigeria • Ensure demarcation of environmentally sensitive parts of the country e.g. wetlands that are off-limits to mining should be captured on maps	NGSA MSMD	Short to medium-term
	• Equip the research functions of technical departments in the ministry with tools for field exploration and analysis	MSMD	Immediate
	• Designate (and expand the use of) specific funds to enable and strengthen public geoscience research - E.g. Specify a percentage of the Solid Minerals Development Fund to be used for grants and awards in public geoscience research	MSMD Central Bank	Short-term
	• Upgrade existing National Geosciences Research Laboratories to conduct analysis and provide accredited services to the local mineral exploration and mining industry	NGSA MSMD	Ongoing
Data Dissemination and Archiving	• Package existing data by state, mineral type and other relevant parameters, and make it available via electronic means to every state government, private investor and other stakeholders • Expand the channels for accessing public geoscience data - E.g. a web portal for global internet access with data searchable using parameters such as state, mineral type, status, etc.	MSMD NGSA	Short-term

Category	Initiative	Owner	Timeline
	- Regular publishing of the data through traditional journals and in trade conferences		
	• Establish a national database that will allow for storage, management and assessment of geological information	MSMD	Short-term
	• Establish national reporting standards, in line with global best practice • Formalise the reporting of geoscience data by industry participants to give credibility and protect the integrity of geoscience data from Nigeria	MSMD NGSA COMEG/NMGS National Bureau of Statistics	Ongoing

Table 7: Initiatives to address challenges in building a business-friendly enabling environment

Category	Initiative	Owner	Timeline
Skills and Capability Building	• Identify gaps in existing institutional and administrative programmes and propose changes that would promote the MSMD's long-term vision for the sector as well as employment and economic linkage targets.	MSMD NIMG Professional associations	Immediate
	• Partner with the NUC to review curriculum of mining schools and degree granting institutions to continuously gauge and refresh quality and relevance to meet industry needs - Engage industry and foreign professionals to ensure that the curriculum is in line with field requirements and global best practices	MSMD Tertiary Institutions Nigerian Universities Commission	Medium-term

Category	Initiative	Owner	Timeline
	• Begin study tours to operating mines in other countries to understand their success stories and to help build local capacity - Use this as a means to supplement current curriculum with practical training pending the start-up of mines in Nigeria	MSMD NUC	Medium-term
	• Design and advocate local content development initiatives in the sector • Work with Nigerian Content Development and Monitoring Board (NCDMB) to incorporate local technology transfer and skills development in government driven industry projects - Ensure however that quality of delivery is prioritised, that it is not compromised	MSMD National Assembly Professional associations NCDMB	Medium-term
	• Strengthen the ability of the NIMG and its Mining Community Resource Centre (MCRC) to deliver originally planned training objectives - Support the hiring and training of faculty through designated funds and grant allocations - Expand the programme offerings and locations to increase access to the wider population	NIMG MSMD	Medium-term
	• Establish reference laboratories to conduct standards based testing e.g. - Establish quality of ores and other mineral assets - Detect environmental contaminant levels (e.g. lead, mercury) - Confirm the quality of explosives manufactured locally or imported to ensure both productive potency and safety	MSMD	Short-term
Gender Equity and Female Participation	• Ensure gender mainstreaming of mining policies in Nigeria, understanding and mitigating their negative impact on women - Conduct field research and studies to assess the impact of existing policies on the welfare of women in the sector	National Assembly MSMD Women in Mining in Nigeria	Medium-term

Category	Initiative	Owner	Timeline
	- Ensure that wherever possible, field data is disaggregated by gender so that biases and skewed experiences of women can be identified		
	• Create opportunities for women in senior-level ministry and agency positions to improve decision-making and provide role models for women in the sector	MSMD Women in Mining in Nigeria	Medium-term
	• Conduct trainings and workshops within the sector, particularly among the ASM communities, to create awareness on the issues and challenges that women face	MSMD Professional associations Women in Mining in Nigeria	Medium-term
	• Provide targeted health care services for women within the ASM communities and at mining sites to encourage their participation (e.g. reproductive health counselling, maternal health services, etc.)	National and state ministries of health and women affairs MSMD Women in Mining in Nigeria	Short-term
End Child Labour	• Establish clear guidelines in the industry to ensure that the practice and engagement of exploitative child labour in the field is progressively brought to an end	MSMD Ministry of Labour NAPTIP	Short– medium term
	• Conduct sensitisation workshops within the industry, particularly ASM communities on issues around child labour practices	MSMD	Short – medium term
	• Advocate and enforce strict penalties for employers and mine-owners guilty of violating guidelines	MSMD National/state assemblies	Medium-long-term

Category	Initiative	Owner	Timeline
	• Provide child-specific support services (e.g. basic primary education, healthcare and counselling) to cater for children in the mining communities	Federal and State Ministries of Education, Youth/Sports	Medium-long-term
Build Supporting Infrastructure	• Work with the federal and state ministries to develop and coordinate infrastructure master-plans and ensure that necessary projects that will facilitate the growth of the mining sector are considered and included in those plans - Prioritise and fast-track the rail corridor from coastal ports e.g. Warri to mining clusters - Remove the monopoly held by the Nigerian Railway Corporation to ensure that private investors can expand rail access - Lift the cargo type restrictions on ports in order to broaden their overall economic appeal to cargo volumes beyond mining to ensure sufficient capital investment flows into these ports • Coordinate with sub-regional bodies (e.g. ECOWAS) to align on infrastructure development that supports mining	MSMD Appropriate Federal and State MDAs ECOWAS AfDB	Short-term
	• Designate appropriate industrial zones and clusters to accelerate infrastructure development, especially for the beneficiation, refining and processing segments of the industry	MSMD Appropriate Federal and State MDAs	Short-medium term
Financing and Business Climate	• Fund and scale the Solid Minerals Development Fund (SMDF) as envisioned in the Mining Act to expand access to funding within the sector • Leverage the SMDF to facilitate the emergence of private sector financed mining funds designed to improve access to working capital and equipment funding for mining value chain	MSMD Ministry of Finance CBN Governors Forum	Short-medium term

Category	Initiative	Owner	Timeline
	• Identify and evaluate Ministry's access to key funds useful for development of the sector e.g. the Steel Levy Fund • Support State Governments in developing a model transaction template for investing in mining companies and similar private partnerships		
	• Educate financial institutions and other Nigerian lenders e.g. banks on the mining sector to facilitate further access by the sector to loans and credit • Encourage lenders to build mining desks and teams at banks as a first step towards improved risk management at banks	MSMD Professional Associations CBN DFIs Commercial banks and other lenders	Short-term
	• Establish and expand grant-making and giving institutions, to support small and medium scale mineral resource exploration and mining	Donor Agencies BOI	Short-medium term
	• Actively promote foreign direct investment in the mining sector by conducting active investment promotion and improving the ease of doing business (e.g., roadshows, global conferences, ease of access to quality geosciences data, and targeted incentives)	MITI MoF MSMD CBN	Short-term
	• Leverage financial sector to provide credit, record and business management training to ASMs to expand awareness and utilisation of credit within these communities • Build an ecosystem of ASM Cooperatives capable of driving formalisation of mining activities - Audit and review ASM cooperatives in existence to evaluate continued relevance	MITI, MoF MSMD CBN SMEDAN	Short-term

Category	Initiative		Owner	Timeline
		- Work with natural groups within mining cluster regions to form ASM cooperatives based on a template to be developed by MSMD - Co-fund and train “Business Managers” for ASM cooperatives to ensure ASMs have best professional advice		

Delivering the Roadmap

Previous administrations have developed roadmaps to rebuild the mining sector. The achievement records of those roadmaps have been less than stellar, given the neglect following them once the supervising Minister has exited office. In order to avoid that outcome, we have drawn a number of important lessons on which our recommendation to the Ministry is based:

- The roadmap must be owned by the industry and its key stakeholders, not just the Minister
- Implementation of the roadmap and its key market enabling elements needs to be the responsibility of a dedicated coordination team, and not just the Minister or civil servants
- An explicit process has to be in place to review progress against the Roadmap and course correct as appropriate

Based on these lessons we have drawn, the Committee is therefore recommending that the Honourable Minister create a new **Mining Implementation and Strategy Team (MIST)**[24] to coordinate the implementation. MIST is also a **programme management unit** that will lead the execution of the Roadmap across the Ministry, its key agencies and departments, other MDAs across the Government of Nigeria, key industry partners, stakeholders and investors, and drive it to results. Note that the MIST is not intended to replace the Ministry and its teams whose functions are regulatory specified. Instead the MIST is to act as a special coordination office housed in the Ministry to drive the performance and behaviour of multiple stakeholders across the minerals and mining ecosystem. Below we further articulate the key elements of MIST:

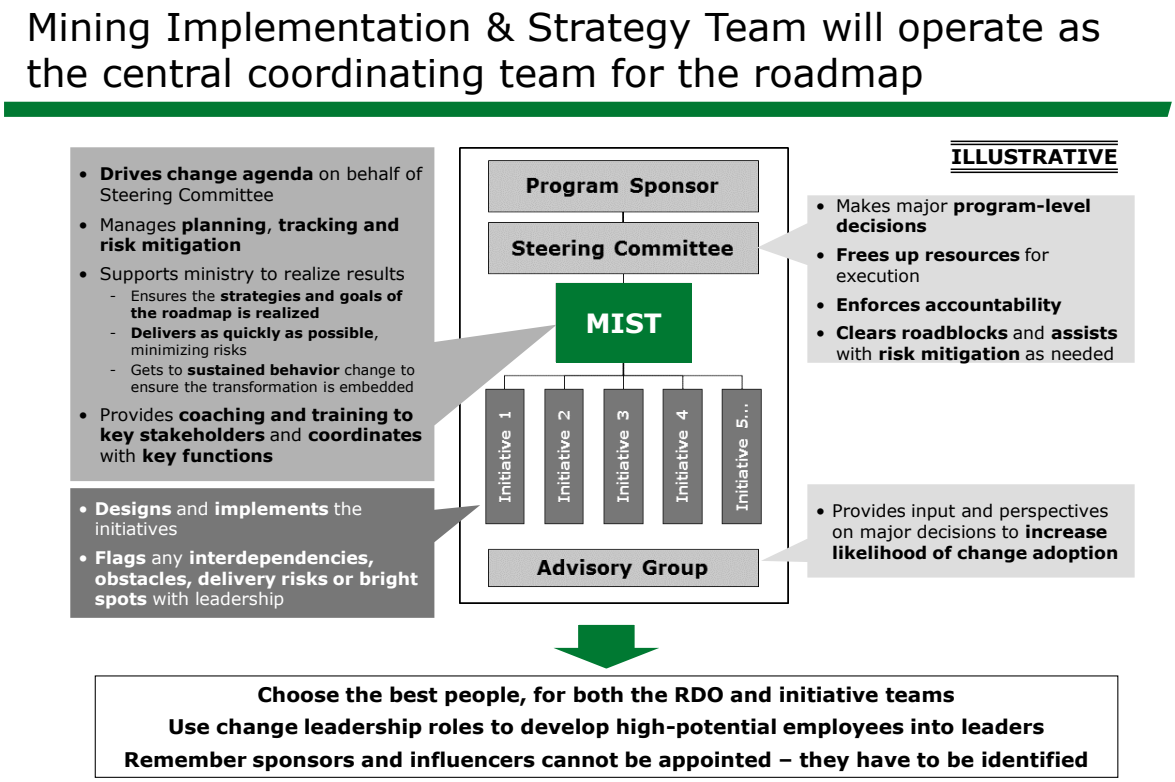


Figure 14: The Mining Implementation and Strategy Team (MIST)

[24] MIST is only a suggested name of the team meant to drive the implementation of the roadmap.

Mission

- MIST will be the process owner of the Mining Roadmap and ensure that it is implemented by the key stakeholders as identified in the roadmap
- MIST, in concert with the Minister, will also chair a bi-annual revenue process to ensure that the Roadmap is on track, and appropriate course correction is conducted
- MIST will not compete with the broader work of the Ministry; instead, it will be the "delivery arm" of the Roadmap ensuring that all key parties remain focused on implementing it, irrespective of shifts in leadership within the Ministry and the broader government

MIST's design principles should focus on good governance to support effective decision-making

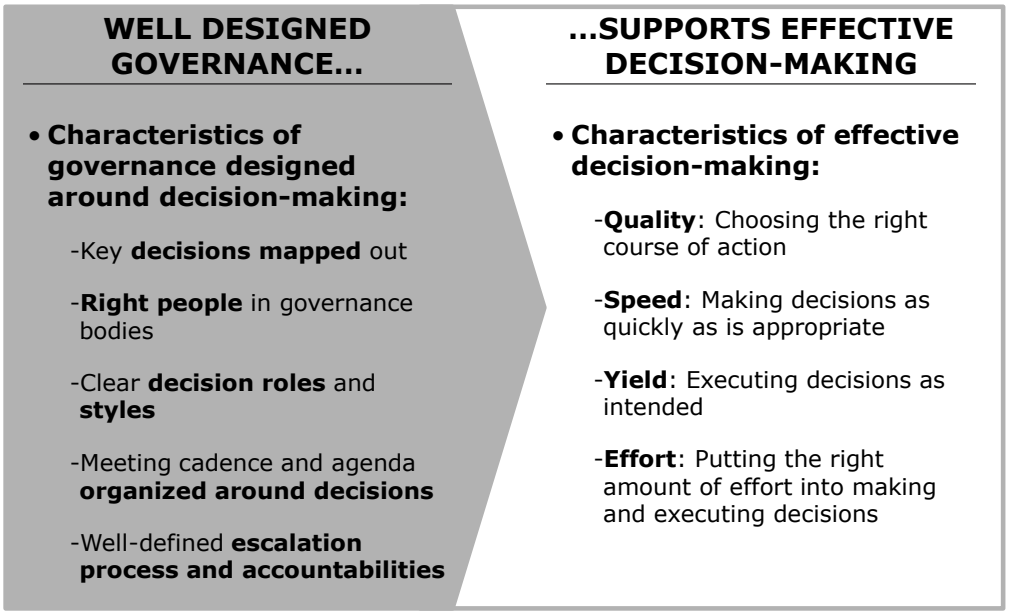


Figure 15: Guiding principles for MIST

Accountability

- MIST will report directly to the Honourable Minister of Solid Minerals (and successors)
- Progress on implementation of the Roadmap will be discussed with the Minister on a monthly basis (or a suitable time period as appropriate), with a quarterly update presentation for the President of the Federal Republic
- MIST will be responsible for tracking progress on the implementation of the key categories and activities in the Roadmap to ensure timely course correction as appropriate

Composition

- MIST should be a coordinating mechanism that can develop integrative analysis or coordinate with other parts of the minerals and mining ecosystem to ensure the development of such analysis
- It is recommended that MIST officers be drawn from different backgrounds in the sector to ensure it has strong expertise to navigate and coordinate the initiatives

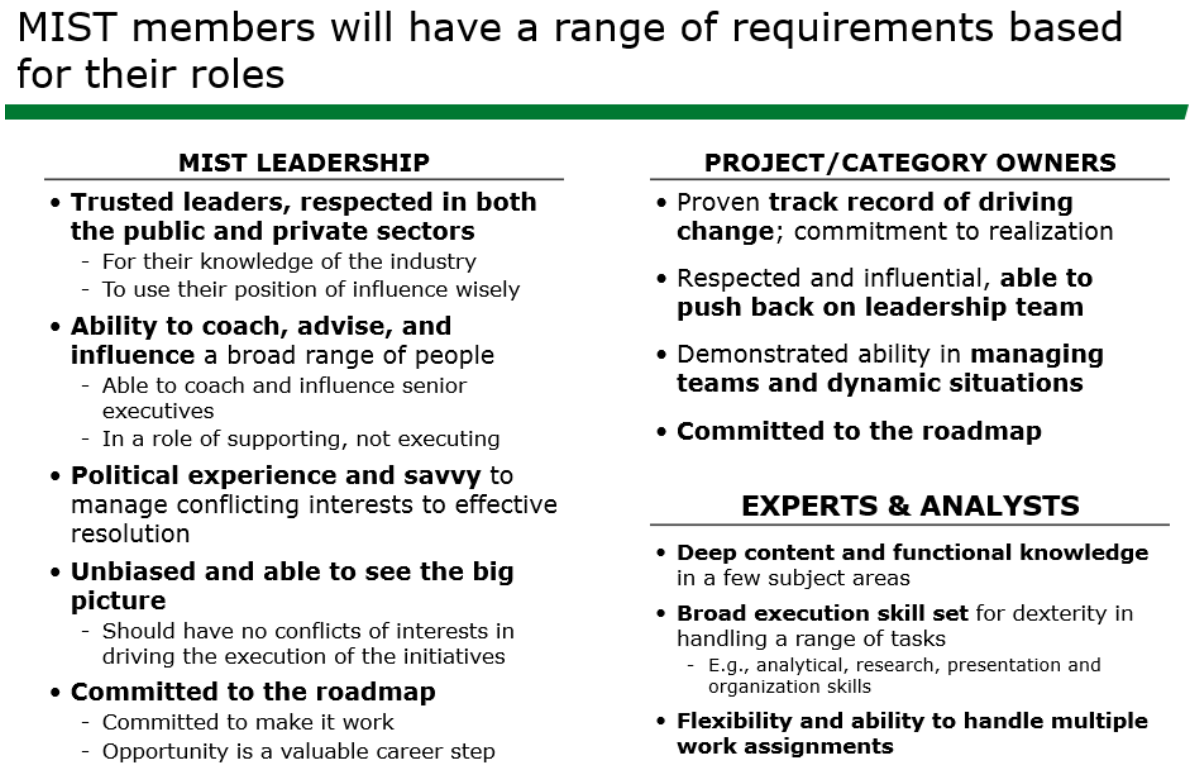


Figure 16: Roles and responsibilities of MIST members

MIST Duration

- MIST is expected to run for ten years, to match the duration of the roadmap and to ensure the entrenchment of a deep campaign of reform and establishment of early success stories in exploration, development, mining and processing.
- During this period, MIST will focus on executing the Roadmap, coordinating activities alongside the Ministry, and driving other key partners to action either directly, or via the instrumentality of the Ministry

MIST Key Performance Indicators and Review Cycles

Key performance indicators (KPIs) are metrics and outcomes that track progress of execution and highlight whether they are on course to fulfil their intended outcome in the original time allotted. Where they are not, corrective actions are triggered in order to rectify progress.

Best practice for setting KPIs is to have a combination of leading and lagging indicators assigned to each initiative. Leading indicators are typically forward-looking – if satisfied, they suggest that the initiative is likely to meet its goal. Lagging indicators are backward looking and measure specific accomplishments/milestones expected with the initiatives[25].

For the MIST team, a set of principles and broad KPIs have been identified:

[25] As an example, a **leading indicator** for increased activity in the mining sector could be the number of licenses applied for and received for a certain mineral. This tends to show increased interest by the investment community and suggests that implemented incentives are working and will likely result in prospecting and ultimate production of this mineral. A **lagging indicator** will be the amount of that mineral that was ultimately produced at the end of particular time period. If the goal was the production of 5million tons of the mineral, the production indicator will show ultimately whether the goal has been achieved.

- MIST will be evaluated based on metrics derived from its mission i.e. the Roadmap. One of the first assignments of the team will be to create detailed metrics based on the initiatives above
- An initial pool of metrics will include but not be limited to the following:
    - Geosciences data produced at appropriate scale e.g. 1: 100,000
    - Increase in revenue generated
    - Direct and indirect contributions to GDP
    - Production levels by minerals and ores
    - Trends in application of mineral titles, acquisition and general administration
    - Job growth in minerals and mining sector
    - Mining talent developed and employed in the sector
    - Mineral import trends of Nigeria
    - Domestic beneficiation and processing of minerals
- MIST will also be responsible for developing a monitoring and evaluation framework for the initiatives

Roadmap Risks and Mitigations

The primary risk the Roadmap faces is the risk of institutional lack of courage and action leading to the plan not being implemented as conceived. In such a circumstance, while a measure of progress will be made in mining, the full potential of the sector will not emerge as anticipated by the roadmap. Causal factors for non-implementation could include a loss of political will by the supervising Minister and Ministry, a reversion of oil prices to historical norms, and a rise in other sources of wealth for Nigeria.

To avoid such scenarios, it is critical that the Ministry set-up an accountability mechanism for the Roadmap. This is the proposed Mining Implementation Strategy Team (MIST) that will own the Roadmap and ensure that progress is made on the plan. By requiring the MIST to publish its KPIs to the Minister, the Executive Council of the Federation, the National Economic Council, and of course to all Nigerians, the Committee expects that a continuum of responsibility can be established irrespective of Nigeria's external circumstances.

Implementation Uncertainties

The risk described in the previous section is one which is believed to largely be in the control of the actors and implementers of this roadmap, hence the outline of a mitigation strategy to deal with it. Beyond this, there are other exogenous factors which will affect the implementation of the roadmap and over which the Ministry has no direct control. Some of these include:

- **Continued decline in commodity prices globally:** The growth slowdown in China and other major emerging markets has significantly diminished the demand for minerals and commodities, pushing down prices. This has negatively affected profitability margins and discouraged investment globally over the last 18-24months. If this trend continues, it might prove difficult to attract the level of foreign direct investment needed to support the sector
- **Security:** Terrorism, violence and general insecurity remain hindrances to investment and the business environment in certain parts of Nigeria. It is especially amplified in the mining sector, given the harshness of the working conditions and also the remote nature of the locations, away from developed security infrastructure.

- **Upturn in oil prices:** Recent interest in mining has no doubt been spurred by the significant drop in oil prices in the last 24 months, forcing the country to begin to actively consider ways to diversify its economy away from oil. There is a risk that the momentum that has been gained could be lost if oil prices pick back up, hindering or altogether forcing abandonment of the plan
- **Corruption:** Graft has plagued most transformation programmes in Nigeria, as the desire for personal gain on the part of the implementers has often taken priority over the collective, shared benefit of the citizens of the country. The current administration has committed to rooting out corruption within the government but if it fails to make significant headway, the success of this roadmap will be jeopardized.

We believe it is necessary to acknowledge these uncertainties upfront so that adequate mechanisms (and scenario options) be put in place to deal with them, and also that the the right expectations for MIST can be set within these scenarios.

Summary

In this chapter we have outlined a detailed set of initiatives that form the core of this Roadmap. As the mining sector in Nigeria develops, we expect it to have the following:

- A robust institutional and governance framework that provides adequate oversight and guidance
- Stronger participation and shared responsibility from the states and communities
- A wider spectrum of vibrant participants across the entire value chain
- A solid archive and database of geoscience research and data that actively encourages investor participation
- A thriving enabling environment that provides the key support infrastructure and services that enables the industry to flourish

Achieving the goals and initiatives listed in this chapter requires the active buy-in of all the participants (listed and to be determined) to the vision and strategy of the sector. This will need a coordinated communication strategy designed to the needs of each stakeholder group, which is the focus of the next chapter.

Chapter 5 – Communication Strategy

Overview

An important element in ensuring that the Mining Roadmap is implemented as designed, it is crucial to ensure that the key beneficiaries of the plan own its dissemination. These beneficiaries include investors, state governments, communities, the Federal Government, professional societies, etc. By taking ownership of the plan and helping ensure the accountability of implementation, a key barrier to previous plans will have been overcome. However, the Ministry needs to provide a reasonable nudge to the industry to help them own the plan over time. Therefore, going forward, Nigeria will require a coordinated and focused communication strategy to support execution of the Mining Roadmap. While leveraging the lessons learned from the past and the best international practices, the Committee recommends the following action items:

Setting the Context

- The Ministry should develop and disseminate a single view[26] of the Nigerian mining industry opportunity, drawing upon data from its multiple agencies and departments; the proposed MIST team will advise the Ministry's civil servants towards building that single, graphical view of the mining opportunity
- That single view should be updated periodically to reflect learnings from the field such as updated and certified geological data, clear legal framework, and other relevant information to support local and international stakeholders
- Given focus on crafting and disseminating a clear industry narrative, it is worth reconsidering the name of the Ministry, and exploring a new name such as "Ministry of Mines" designed to reflect the broader ambitions of the Ministry.

Focusing the Message

- The Ministry and its teams should build targeted messaging that speaks to the needs and priorities of various stakeholders e.g. environmental protection, gender rights, economic profits, foreign exchange and dividend repatriation, regulatory stability and infrastructure growth for example
- Investing in understanding the priorities of various stakeholders will also help the Ministry respond more effectively to shifts in market and stakeholder requirements well before they become issues or concerns

Engaging Audiences

- The Ministry should host a series of town hall meetings in mining communities to help articulate the Roadmap and share the implications of success in mining for their communities
    - Such engagements should be conducted in the context of a broader, longer-term aim to build trust between the communities and the ministry

[26] **Single view:** A definitive reference source for data on the state of the industry which investors can rely on

- The Ministry in partnership with the proposed MIST team should also continue to support the Minister's engagement with a variety of professional societies, financial investors and operators, reinforcing the idea that Nigeria is 'open for business'

Coordination Mechanism

- The Ministry should task a new team[27] to lead and communicate all relevant 'communication activities' in order to ensure alignment on messaging and channels for engagement
- The Committee proposes that the Ministry should set up a centralised Communication Council, whose objectives will be to coordinate the creation and the delivery of all content leveraging the right channels and tools (website, social media, industry-focused conferences and magazines, etc.)
- The Communications Council should be drawn from media personnel across the Solid Minerals MDA to ensure that all appropriate personnel are involved in the process
- In addition, the Council should have a spokesperson who will also speak on behalf of the Ministry and ensure that regular sectoral briefings are prepared for dissemination to Nigerian and global financial and mining media

Measuring Progress

- A key early task for the Communication's team would be to agree on what its Key Performance Indicators (KPIs) should be
- Some of the team's KPIs will build on those by which the MIST team will be measured, hence partnership between these two teams is of utmost importance

[27] This team will be expected to be subsumed within, or work side by side with the MIST for effectiveness

Chapter 6 – Next steps

The key next step for the Roadmap is implementation. In order to focus the Ministry's efforts, we have identified critical actions based on priorities outlined throughout the document. Most are just concise restatements of the ***immediate*** initiatives presented in Chapter 4, but they are specifically included and highlighted here to establish their priority and importance for getting the plan moving to action.

- Review and launch the Roadmap as the starting point for the industry's transformation
- Finalise the structure of the Mining Implementation and Strategy Team and begin its resourcing, staffing and mobilisation
- Charge the MIST team with the responsibility of launching key investment related support work and producing a detailed set of KPIs and metrics to evaluate the progress of initiatives
- Set up the communications team and finalise approach for promoting and communicating the key messages and thrusts of the roadmap
- Kickoff the process to grow domestic use of industrial and energy minerals; commence collection of data required to build the "supply – demand" gap analysis, and facilitate supply discussions with private investors
- Initiate relevant regulatory and organisational refinements that are necessitated by the agreed roadmap
- Work with states and local governments on respective responsibilities in developing enabling infrastructure and begin process of integrating mining needs into infrastructure master plans across states and at the Federal level
- Finalise the review of existing industrial assets controlled by the Federal Government and design the criteria for evaluating and selecting potential investor and private-sector partners, starting with critical assets of national interest e.g. Ajaokuta
- Work with the MCO to accelerate the digitization and migration of key processes to web based platforms , facilitating the ease of application and issue of mining licenses
- Accelerate the formalisation of artisanal/small-scale miners into cooperates as a mechanism to reduce illegal mining
- Establish and strengthen the Mines Surveillance Taskforce and other units within the MSMD to increase monitoring and enforcement capabilities

Beyond the immediate phase, the MSMD is expected to drive the implementation of the rest of the Roadmap to ultimately build a globally competitive and respected mining sector in Nigeria

Timeline of key action items for executing the roadmap

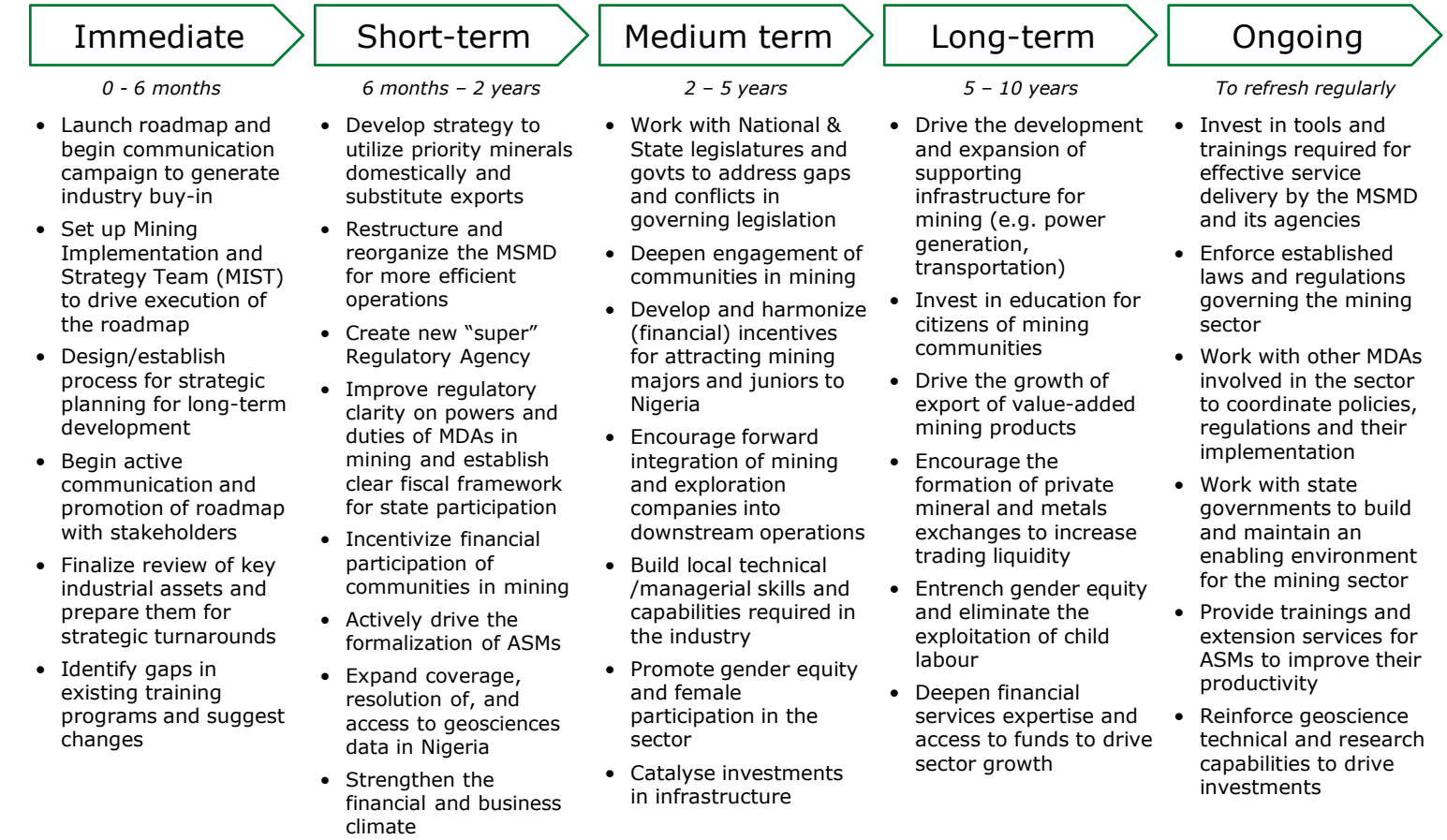


Figure 17: Key action items for the roadmap

Appendix I – Historical context of the Nigerian Mining Industry

Organised mining activities began in Nigeria between 1902 and 1923 following the commissioning of mineral surveys of the Southern and Northern Protectorates by the then British Secretary of State for the colonies in 1903 and 1904. The earliest recorded mineral mined was tin ore (Cassiterite and associated minerals), by the Royal Niger Company in 1905. Gold mining was next, and began in 1914 in areas located within present day Niger and Kogi States. Coal mining followed not long after at Enugu in 1916.

Mining was a significant driver of industrialisation and development in Nigeria. Coal mining gave birth to the railway industry. The earliest rail infrastructure was built to transport mined coal from Enugu to the seaport in Port Harcourt, and to a power plant on the Oji River. With tin ore mining and processing came the establishment of the first power plant in Nigeria, built at the Kura Falls, near Jos by Nigeria Electricity Supply Company (NESCO) in 1928, and owned by the Amalgamated Tin Mines of Nigeria. Finally, with iron ore came the establishment of industrial complexes and behemoths (at the time) of manufacturing: Ajaokuta with 5.7 million tons of liquid steel, Delta steel plant with a capacity of 2 million tons of steel products and 3 inland mills in Oshogbo, Jos and Katsina.

Besides coal, which was mined by a government department, the mining of minerals and metals was entirely in the hands of private expatriates and indigenous companies and entrepreneurs. Prior to 1971, British mining companies dominated the scene with up to 120 companies at the peak of production and this drove high levels of economic output and employment. Notable amongst such mining companies were Amalgamated Tin Mines of Nigeria (ATMN), Gold and Base Metals, Kaduna Prospectors, Bisichi-Jantar and Ex-lands Ltd. The period saw the massive industrialisation of the sector, with the introduction of large equipment such as draglines, dredges, Power Shovels, etc.

In 1971 things began to change as the government reviewed its policy on minerals and metals. It decided to act as a catalyst in the mining sector through the establishment of mining corporations that would use public funds for mining. To achieve this, government decided to participate directly in the mining industry. It established the Nigerian Mining Corporation (NMC) in 1972 to directly invest in the exploitation of known economically viable minerals other than coal and marble. Through its subsidiaries, the NMC engaged in the exploitation of kaolin, barites, cassiterite, columbite, limestone and clays. The Nigerian Coal Corporation (NCC) was separately responsible for mining coal and a little later, the Nigerian Uranium Mining Company (NUMCO) was incorporated to mine and develop uranium. The government also exercised control and direct involvement in the sector through a number of institutions:

- The Nigerian Iron Ore Mining Company (NIOMCO) for iron ore mining at Itakpe
- The National Steel Raw Materials Exploration Agency (NSRMEA) to concentrate on exploration of iron ore and coking coals
- The National Metallurgical Development Centre (NMDC) whose focus was to be on research in mineral processing and downstream utilisation studies on minerals.

In 1972, the government also enacted an indigenization decree which resulted in the acquisition of majority shares in the main expatriate tin mining companies in the country, causing large scale withdrawal of foreign investment in the industry and a downturn in production. With the exit of multinational companies and their expatriate professionals, the bulk of mining operations by the

private sector rested on the shoulders of small-scale indigenous miners. These factors were largely responsible for production decline particularly in the metallic minerals starting in the late 1970s.

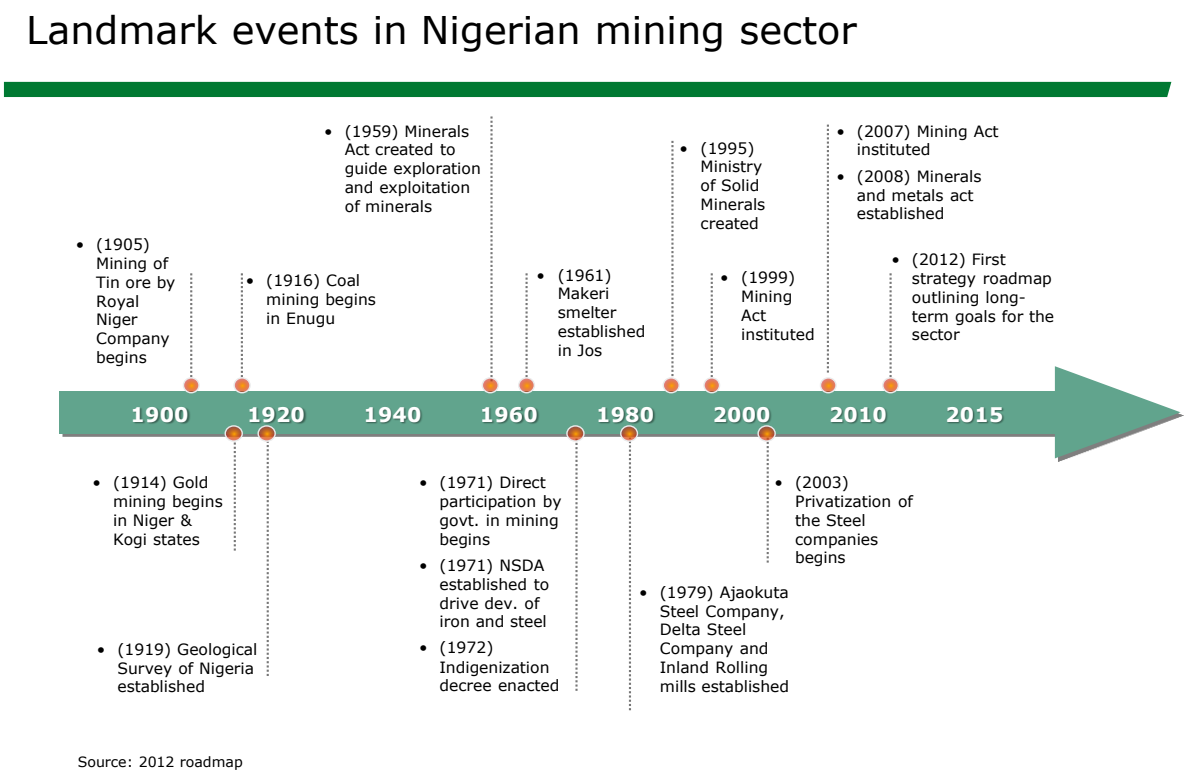


Figure 18: Historical timeline of Nigeria's mining sector

The failure of the nationalisation approach in the 70s and 80s led the Nigerian government to attempt to liberalise the mining sector by enacting a new Minerals Act, establishing the Mining Cadastre and privatizing formerly state-owned mineral investment organizations. In response, Nigeria has in recent times witnessed increased interest in foreign direct mineral investment.

Appendix II – Nigeria's Mineral Endowment

Resource Potential of Nigerian Geology

The most known economic mineral deposits in Nigeria are best grouped in accordance with the three broad geological provinces and age groups (Figure 19). These are:

- Pan-African basement rocks.
- Mesozoic Younger Granites.
- Cretaceous-Tertiary sedimentary basins

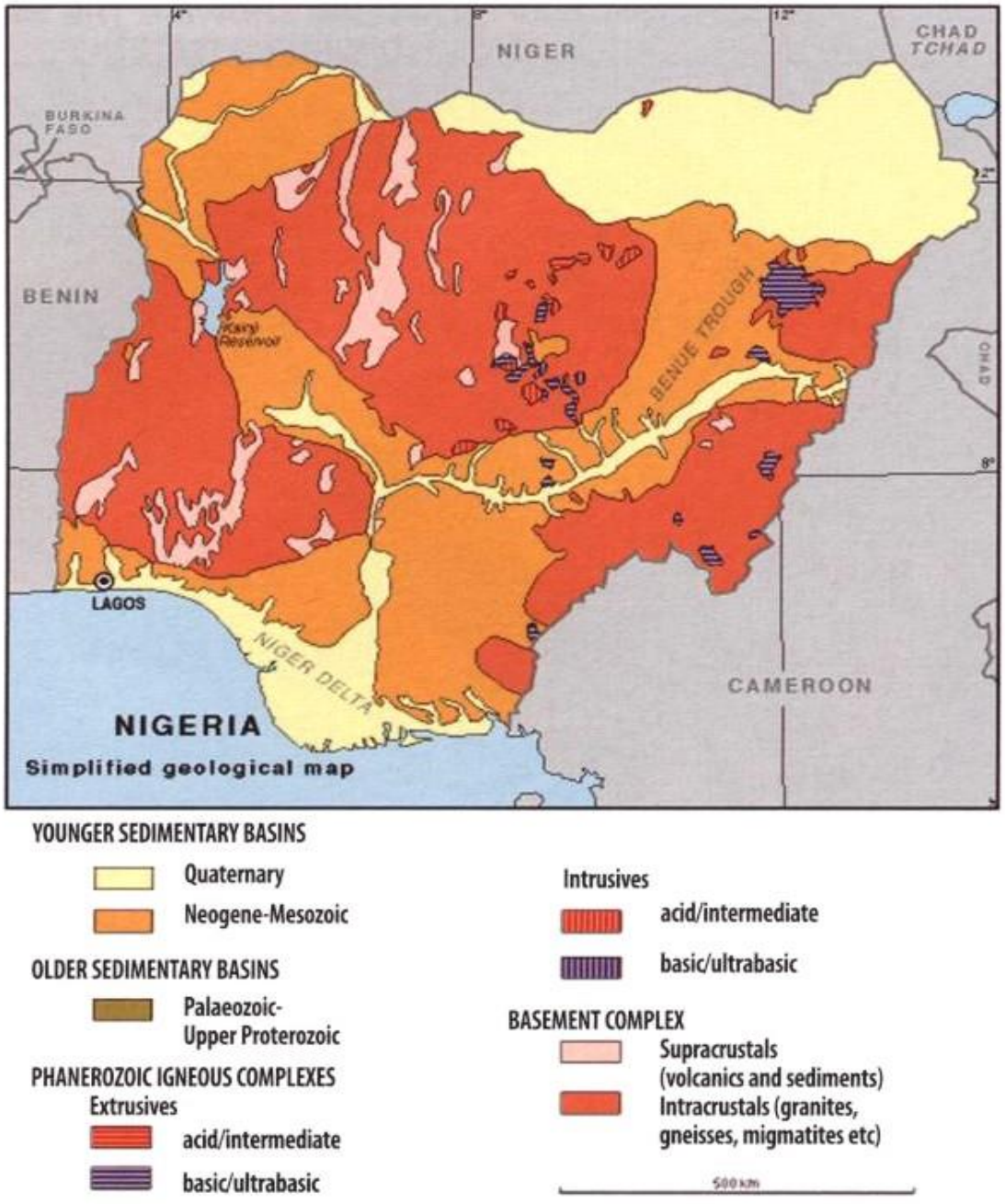


Figure 19: Geologic Map of Nigeria

Each of these is discussed in detail below:

Resource Potential of the Nigerian Pan-African basement

Gold: Associated with the schist belts of western Nigeria, mostly in the northwest. There has been widespread small-scale mining targeting rich veins and associated eluvial and alluvial deposits.

Tin-Tantalum-Niobium: A broad belt of tin-tantalum-niobium bearing pegmatites extends north-eastwards for about 400 km from near Ile-Ife (Osun State) to the Wamba-Jema'a areas (Nasarawa and Kaduna States) just southwest of the Jos Plateau. In addition to the main economic minerals cassiterite, columbite and tantalite, there are a host of accessory minerals including scheelite, wolframite, beryl, apatite, monazite, micas (muscovite and lepidolite) and tourmalines.

Iron Ore: There are widespread occurrences of iron formations (BIF) in the schist belts, but they are much smaller and leaner than the itabirites of the Archaean terranes, with grades seldom exceeding 40% Fe. However, there are purer iron ores interbedded among basement gneisses in the Okene-Lokoja area (Kogi State). These are probably older metasedimentary or magmatic relics and could be as old as the Archaean and perhaps can be correlated with with the iron ores in Liberia and Guinea. About 200 million tonnes of 30-50% Fe have been proved so far to provide the main raw material feed for the Ajaokuta and Aladja steel plants.

Chromite and Nickel: Small chromite deposits are known to be present in some ultramafic (serpentinite) masses associated fault structures in the schist belts, especially in the northwest. Such bodies are also found to have economic quantities of **Nickel, Talc, Asbestos and Magnesite**.

Uranium: A possibility of vein-type uranium mineralisation in the basement granites of the northeast has stimulated exploration in the past, mostly driven by the success in northern Cameroon east of the Mambila plateau.

Industrial Minerals: In addition to **Talc, Asbestos** and **Magnesite**, other industrial minerals such as **Kyanite** and **Sillimanite,** known in some schist belt locations are found in the Pan-African basement in Nigeria. Additionally, **Feldspar** and **Kaolin** are found in granitic rocks. **Marble:** Major industrial mineral known in a number of locations in the basement, especially in central Nigeria (Kogi-Kwara States and FCT). A large deposit near Lokoja (Obajana) is now host to one of the largest cement plants in Africa.

Resources Potential of the Sedimentary Basins

The Cretaceous-Tertiary basins of West Africa are of great economic importance to the countries in which they occur. Virtually all of West Africa's energy resources are present in these basins.

Oil and Gas are of greatest importance and are dominated by the enormous reserves of the Niger Delta Basin, other coastal basins and also in the interior basins. There are similarly enormous reserves of **Coal** in Nigeria, while **Uranium** deposits discovered in the Republic of Niger are some of the world's largest.

Tar Sands/Bitumen: The existence of huge deposits of tar sands in Nigeria is composed of sand, heavy oil (bitumen), mineral-rich clay and water in varying proportions. This heavy oil in tar-sand is

commonly referred to as bitumen. It is a viscous and complex mixture of hydrocarbons and other heterocyclic substances. Extensive seepages of bituminous sand are known to occur along an East-West belt stretching over an area of about 120 km x 6 km across Lagos, Ogun, Ondo and Edo States in southwestern Nigeria). Many attempts have been made, mostly by the Nigerian government, to explore the commercial viability of the resource and reported resources equivalent up to 13 billion barrels of oil.

Coal: Major occurrences of coal are known from the Lower Benue Trough where several seams occur among the Lower Coal Measure. The exploitable parts of the coalfield are on the gently west-dipping eastern limb of the broad synclinal structure (the Anambra Basin) of the Lower Benue Trough. Coal is best developed around Enugu with seams 1-2 m thick and more than 300 million tonnes of estimated resources. The coal is sub-bituminous with average calorific value around 10,000 Kcal/kg. There are other coalfields in the Middle and Upper Benue Trough, with some relatively thicker seams and shallower coal seams being developed in recent times. Deposits of **Lignite** occur in the Tertiary sediments of the Niger Delta Basin, notably in the Ogwashi-Asaba Formation, where seams up to 6 m thick are reported with total resources estimated to be some 60 million tonnes. Lignite is also known to be found in the Sokoto and Chad Basins.

Metallic minerals: Lodes and veins containing economic quantities of **Lead and Zinc** (galena and sphalerite) with small amount of **Copper** (chalcopyrite) have long been known in many locations in the Benue Trough, from Abakaliki area (Ebonyi State) to the Gombe area (Gombe State). This region has been the attraction of some exploration and mining activities in recent times. **Iron Ore** in form of plateau-forming oolitic and pisolitic ironstones of the Cretaceous sequence of the Niger (Bida) Basin have long been recognised as potentially huge iron ore resources with grades up to 60% Fe. They, however, remain unattractive due to the relatively high phosphorous (2% P_2O_5) and sulphur (1%) as impurities, even though the quantities are large, perhaps as much as 2 billion tonnes.

Industrial minerals: Limestone, suitable for cement manufacturing occurs in a number of places in the sedimentary basins of Nigeria, and cement industries have been established near several of its reserves. An additional resource in some of the associated shales is **Gypsum**, which is also used in the manufacture of cement and occurs in exploitable quantities in a number of locations. **Baryte** and **Fluorite** are commonly associated with the lead-zinc veins and occur in exploitable quantities in a number of locations. **Phosphate, Kaolin** and other **Clays** (including refractory **Fireclay**) and **Diatomite** have been reported, explored and even exploited in a number of localities within the sedimentary basins.

Resource Potential of the Nigerian Mesozoic Younger Granites

The Younger Granites of Nigeria are famous for their **Tin** (cassiterite) and **Niobium** (columbite and pyrochlore) mineralisation. The **Uranium** content of the **Pyrochlore** is believed to probably be the primary source for the sedimentary uranium deposits in Niger Republic. This scenario presents an exploration challenge for sedimentary uranium deposits in the closely associated sedimentary basins in Nigeria.

Other economic minerals associated with the Younger Granites are **Lead** (galena), **Zinc** (sphalerite), **Wolframite, Topaz, Molybdenite, Scheelite, Zircon, Monazite, Thorite, Cryolite** and gem quality **Beryl**.

Appendix III – Sample Case Studies of Mining Sector Transformations

Given below are a few case studies highlighting the implementation of some of the ideas presented:

Botswana: The Role of an Activist Government

Figure 20: Botswana case-study summary

Ghana: *Integrating ASM into Mining Economy*

Ghana successful in implementing laws directed towards helping artisanal miners & the economy

REGULARIZING ASGM MINERS AND A TRADING PLATFORM FOR GOLD BROUGHT STRUCTURE AND ECONOMIC BENEFIT FOR GHANA

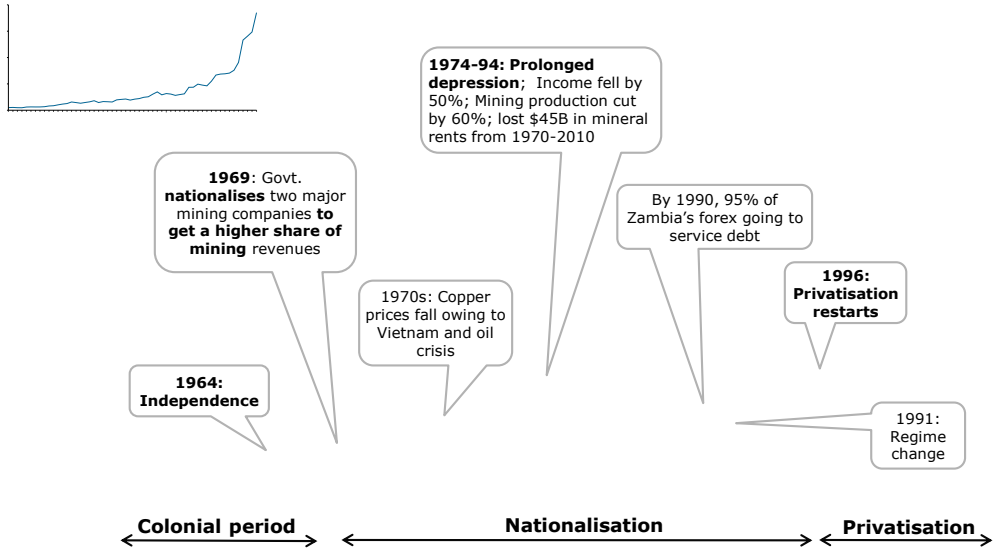
Context	• To **revitalize a stagnating economy in the 1970s**, the government in conjunction with IMF developed a **national Economic Recovery Plan** • **Minerals sector was targeted** within which gold was a priority • Gold production declined to 25% from 1960s to early 1980s and **20% of gold output was being lost** through unmonitored small-scale mining channels
Approach	The plan **regularized small scale mining operations** in 1989 • Small-Scale Mining Law: **Provide technical assistance** for prospective and **registered small-scale miners and promote their activities** • Mercury Law: **Legalized purchase of mercury** from authorized dealers for gold extraction purposes • PMMC* law: **Established body to buy and sell gold**; buying licenses were also granted to 2 privately owned companies to inject some **competition into** gold **purchasing sector**
Outcome	• ASGM **contributed 34% of gold output in 2013** - up from 6% in 2000 • Number of **ASGM** miners increased 30x in 15 years to 2010**; ~1 million in 2010 • **Production from AGSMs increased ~10x** in the 90's

*Precious Minerals Marketing Corporation, ** Artisanal and Small Scale Mining
Source: Lit Search

Figure 21: Ghana case-study summary

Zambia: *Recovering from Policy Errors*

Zambia has learned from the past



Source: Penn World Tables, University of Pennsylvania

Figure 22: Zambia case-study summary

Appendix IV – Financing Mining Exploration and Production

Financing Exploration and Production

Access to capital (credit) is probably the most widespread constraint experienced by West African businesses. Due to the long period of inactivity and slow progress in implementing Government reforms in the mining sector, multinational companies have been reluctant to fund projects in the country. Also, the absence of reliable geosciences data leads to Nigerian mining companies finding it extremely difficult to access finance from the formal money market in Nigeria to engage in meaningful commercial mining, leading them to engage in artisanal mining with its low production volumes, sterilisation of mining sites, land degradation, uncoordinated and inefficient methods and its inherent threats to worker safety. A key challenge is inadequate access to long-term loans for facilities to procure site equipment. Banks favour short-term loans as opposed to long-term financing required in the mining sector. Other financial challenges are poor financial management by miners, unwillingness of banks to fund the sector, and high cost of capital.

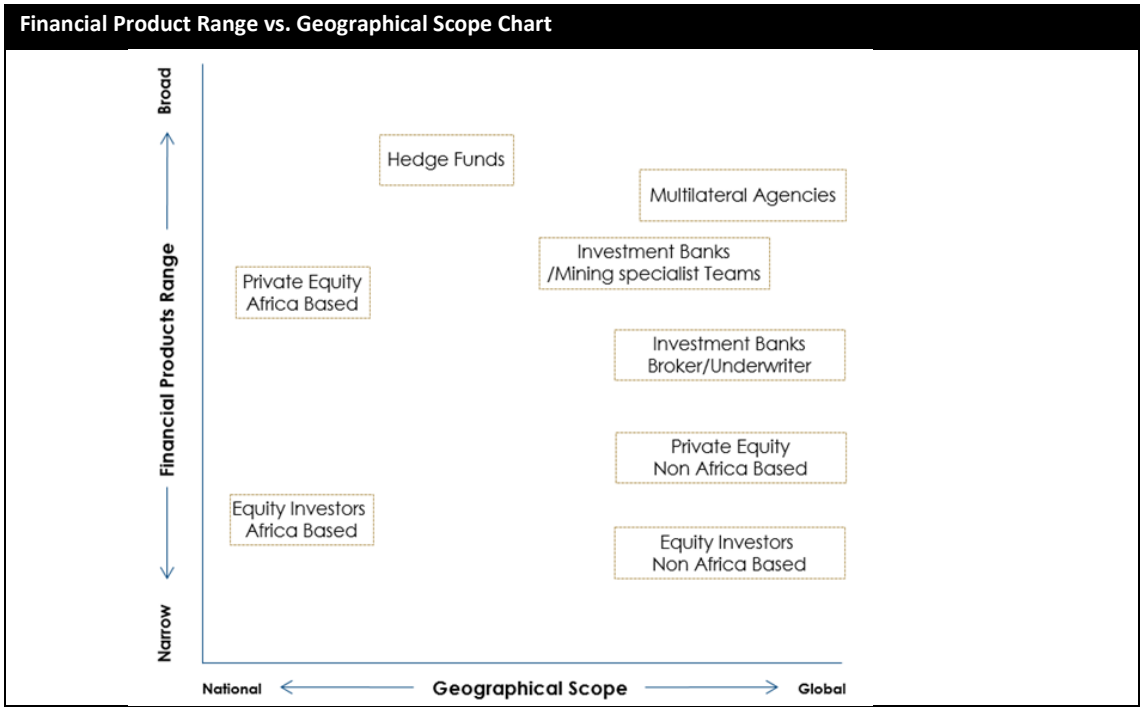
Traditional Financing Providers for Exploration

Financing in the African mining sector is complex with significant barriers to entry. Partnerships with experienced industry players is critical for fledgling jurisdictions.

Below is a summary of key financing developments and learning points across Africa which Nigeria will need to consider in order to develop the sector:

- Total number of projects invested in/financed across Africa has been about 500 in the last 5 years
- The need to invest large financial resources in order to compete can deter new entrants, and limit pool of new entrants
- Trading houses such as Glencore have entered the mining market through lending their balance sheets to access metals
- Sovereign wealth funds and state-owned firms and China becoming increasingly active in Africa's mining sector

The below chart outlines the spectrum of institutions who have traditionally provided mining finance across a range of financial products, asset risks, and geographical scope in Africa. The chart shows that multilateral financing institutions and specialist investment banks are most likely to invest in potential mining opportunities with varied risk profile. Nigeria will need to tap a number of these sources to finance its nascent mining sector.



Source: AFC Investment Presentation

Figure 23: Financial products v/s Geographical Scope

Development Financial Institutions

Development finance institutions (DFIs) (or multilateral development banks) provide credit in the form of higher risk loans, equity stakes and risk guarantee instruments to mining companies operating in developing countries. This type of financing requires significant diligence on the part of the lender, and as such is often seen as a vote of confidence in the project for future lenders, making subsequent capital raising easier. DFI's often have stringent environmental and social standards – and under public scrutiny over their mining investments.

DFIs are key tools for expanding debt funding capacity in Africa. These are particularly relevant where there is insufficient commercial bank capacity in the market or where there is a desire for a more extended tenor than what is acceptable to the commercial banks. They are also perceived as providing political cover, because of their close links with influential donor governments. Prominent examples of companies across Africa that have taken advantage of DFI funding for early stage project financing include Base Resources, Kenmare Resources, and Hummingbird Resources. DFIs have expanded their scope to acquire equity in mining companies whose projects they are funding, allowing developers to cement their relationship with the DFIs ahead of the debt funding stage. Examples of this include the IFC's investment in Hummingbird Resources in Liberia and Baobab Resources in Mozambique. DFIs provide a variety of investment instruments – e.g. senior debt, subordinated debt, equity and convertible finance instruments.

The below table outlines key investments in the sector by some of the DFIs with the potential to invest in Nigeria given their historic involvement in financing mining projects in difficult and often opaque jurisdictions.

DFI	Company	Project	Value US$ 'M	Type
IFC	Oyu Tolgoi	Copper, Mongolia	400	Loan
	Unigold	Gold, Dominican Republic	12	Equity
	Finsch Diamond Mine	Diamonds, South Africa	25	Loan
	Hummingbird Resources	Gold, Liberia	9	Equity
	Sama Resources	Nickel-copper, Cote d'Ivoire	1	Equity
	Guyana Goldfields	Gold, Guyana	165	Debt facility
China Dev' Bank	MMG/China Minmetals	Silver/lead/zinc, Australia	1,000	Loan
	Gindalbie Metals	Iron ore, Australia	250	Loan
	Generaly Moly	Molybdenum, US	665	Loan
	Zijin Mining	Investm't/acq'n	4,900	Loan
EBRD	Dundee Precious Metals	Gold, Bulgaria	45	Revolving Credit
	Coal Energy	Coal, Ukraine	70	Loan
	Oyu Tolgoi	Copper, Mongolia	400	Loan
	Lydian International	Gold Armenia	45	Equity
	Hambledon Mining	Gold Kazahstan	21	Loan + Equity
IDSCA	Scaw Metals	Metals, South Africa	340	Equity
	Sedibelo Platinum	PGMs, South Africa	328	Equity
	DiamondCorp	Diamonds, South Africa	28	Loan
	Village Main Reef	PGMs, South Africa	15	Loan
AFC	Shalina	Copper, DRC	80	PXF Facility

Source: Global Mining Financing Guide 2014

Figure 24: DFI investments

Private Equity Funds

Private equity funds are usually used to finance big ticket mining deals, with a maximum of three to four years from production or are 'brown field' in nature. P.E funds typically take a stake of between 10 and 20% (with a view to exit in three to five years).

Hedge Funds

In order to diversify their portfolios, hedge funds provide equity capital to fund mining operations at pre-development phases. These hedge funds usually adopt a 'buy to own' approach and are more likely to prioritise prospective producing assets.

Private Investors

There is a large pool of family offices, private equity providers and venture capitalists, which are often led by individuals with a background in the exploration sector. These equity providers typically provide early-stage seed money often linked to certain conditions and achievement of project milestones. This group of investors is diverse and given the private nature of their investments, access to them can be difficult. Gaining access through brokers, merger and acquisition (M&A) advisors and professional services firms is often the best way of tapping into these types of investors.

Strategic Investors

Mining companies have become increasingly willing to consider partnering with other strategic investors to fund new projects or expansions. A number of mining players with assets in Africa ranging from the majors to the juniors have launched processes over the past two years in search of JV or minority partners, in most cases with mixed success. Many companies have in particular targeted Chinese strategic players and, whilst there are success stories, such as African Minerals attracting Shandong Iron and Steel as a strategic investor for its Tonkolili iron-ore project in Sierra Leone, Chinese

capital has also become more selective and risk-averse. Other North Asian players have also been actively reviewing opportunities in the space, but with few examples of actual investment.

Export Credit Agencies

Another critical mitigant for debt funding providers has been the ability to obtain export agency cover. Such cover is typically linked to key inputs being sourced in the country of the relevant ECA, but is not necessarily limited to physical inputs such as mining fleet, plant and equipment and can also involve services such as consultancy and EPC contracting. Key institutions that have been active in Africa include the ECIC of South Africa, Canada's EDC, EFIC of Australia and US Exim. Recent mining example: Canada's ECA in Chile - C$65m loan to Chile's Minera Los Pelambres to promote the purchase of Canadian goods and services – e.g. equipment, technology and services; and to help more Canadian companies develop or expand business in the Chilean mining sector.

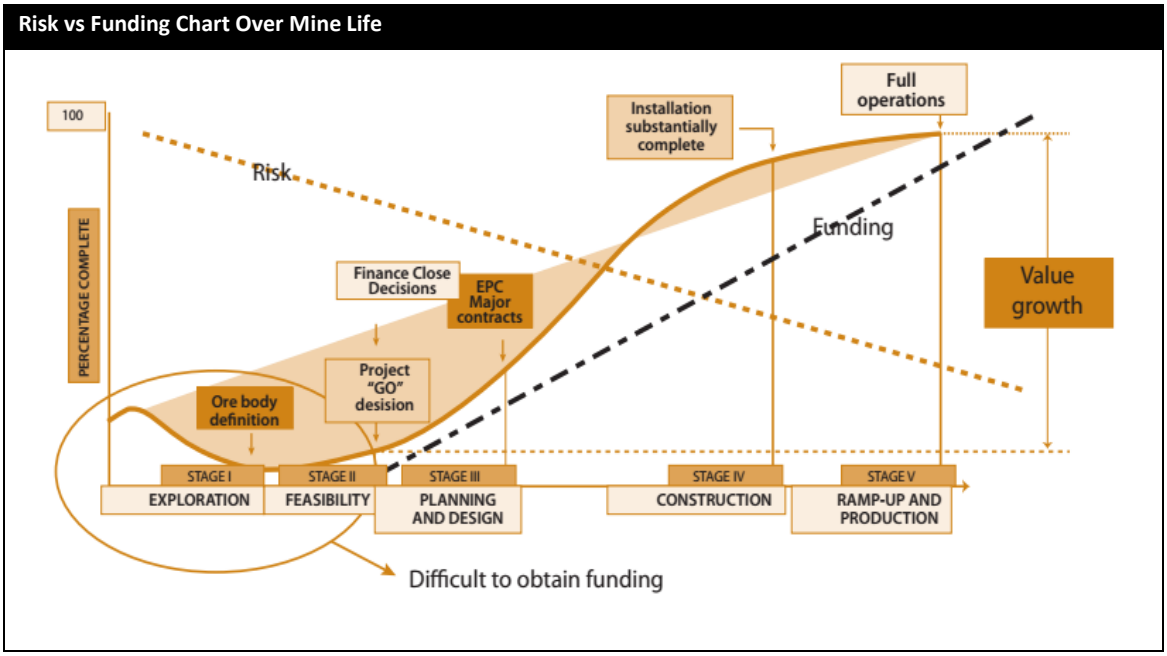
Overview of Traditional Financing Options from Exploration to Production

The high risk allocation in the early-phase of mining projects means that activities such as exploration and ore reserve estimation have the most difficulty for obtaining funding from standard project finance sources. The more advanced the project with feasibility studies conducted and project plans defined, the greater the chances of an increase in funding source options.

Given the nascent stage of the Nigerian mining sector, many of the projects are characterised as stage 1 exploration projects, which will therefore require specialised financing options.

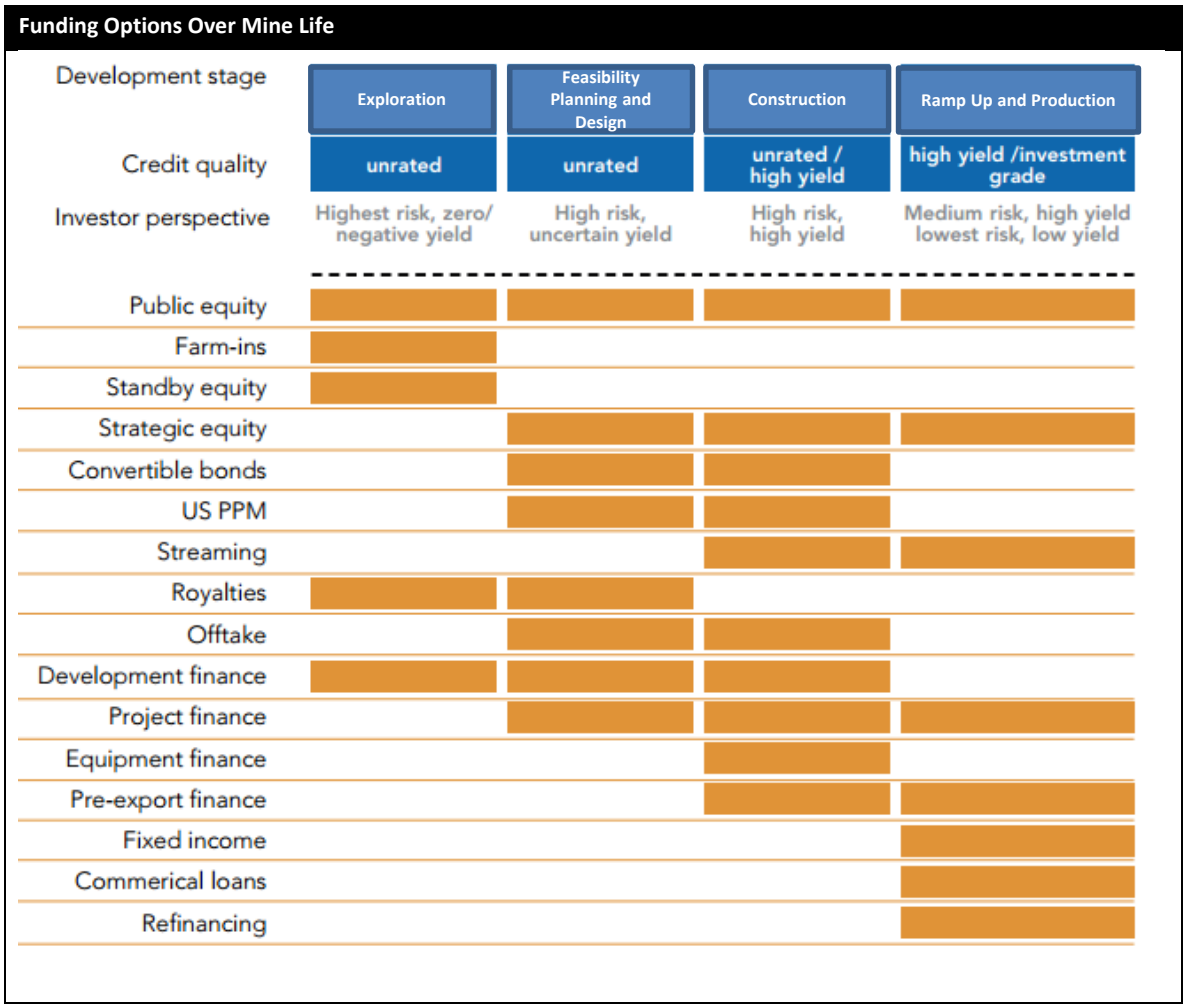
The charts below together outline the various stages of a mine's life in relation to the activities being executed, changes in risk profile hence credit quality and funding options. They show that as the project moves from exploration, to ramp up and production, the risk profile decreases and therefore the credit quality and ease of obtaining funding increases.

The second of the two charts outlines explicitly a wide range of funding options available at various development stages. It shows that equity funding can be utilised through the entire project cycle whereas farm-ins and standby equity can only be used at exploration stage. Similarly, fixed income and commercial loans as well as refinancing mechanisms can only be used at production stage.



Source: Minerals and Africa's Development; The International Study Group Report on Africa's Mineral Regimes

Figure 25: Mines:Risk v/s funding



Source: Global Mining Financing Guide 2014

Figure 26: Funding options over mine life

Traditional financing options:

- **Pre IPO Funding –** early stage equity and project development loans.
- **IPO General Public –** A Nigeria based mining company can choose to raise funds from the general public by floating a percentage shareholding of the SPV created to finance a particular mining project on the Nigerian stock exchange. Depending on the progress made on the mining project, shares could be issued at a premium.
- **Convertible Notes –** These can provide an attractive source of capital in periods of volatility, providing downside protection but also the potential for participation in future upside. However, from a company's perspective, the dilution impact of convertibles is merely delayed (assuming the bond converts), albeit to a point in time where valuations are more easily determined.
- **Farm-in Agreements –** Many juniors make the decision to sell their companies at this point, passing the responsibility of raising funds for continued development work to the asset's new owner. For those that don't sell the company outright, a common form of alternative financing is an asset-level farm-in agreement with a strategic partner. As with similar transactions at the grassroots exploration stage, the acquirer makes an obligation to spend a predetermined amount over a specific time period in order to advance the project to an agreed stage, and thereby earns a defined ownership interest in the project. Funding commitments for these earn-ins are generally larger than in deals involving exploration assets, due to the partial de-risking that has occurred to date, but the basic structure remains.
- **Offtake Agreements and Pre-Export Financing –** These can be in the form of debt or equity and offer upfront capital in return of securing future or current production volumes often at a discounted market price. The investor can often provide marketing services to the mining company and in case of a loan expected to be repaid from the proceeds of exports of the product. While a favourable option, typically these contracts include take or pay arrangements and are consequently secured when an asset is near to, or in, production. As this form of finance evolves in the current market, we are seeing increasing complexity in its deployment. Key characteristics of such agreements include:
    - Pre-production advances in return of future offtake in form of:
        - equity stakes
        - loans (interest- and non-interest-bearing); and
        - Convertible bonds.
    - The exclusive right to purchase production at a determined price (which is usually index/market linked).
    - Built-in options to extend – based on mutual consent.
    - Take or pay agreements (purchase product or pay a penalty).
    - Additional marketing/distribution terms.
    - Some minimum stipulations are common including:
        - minimum volume of offtake over agreed period of time;
        - minimum price in volume-based offtake contracts; and
        - Hedging to protect against volatility.
- **Equipment Financing –** At the construction stage there may be assets in the project, which can be used to raise finance, such as excavation equipment. The company might be able to raise finance secured by existing equipment. It may also be able to enter into buy-back arrangements with the supplier, pursuant to which the supplier agrees to repurchase equipment at the end of the project. Alternatively the supplier may enter into a lease-buy arrangement with the mining company, where the supplier leases the equipment to the

project (taking security over the equipment) and the project eventually buys the equipment at a discounted price. The borrower will be required to sign up to maintenance, repair and insurance covenants.

- **Debt (Capital Markets) –** Whilst the Eurobond market can be tapped into by major mining companies with assets in Africa, such as First Quantum Minerals and the global majors, there is also a track record of smaller miners accessing the bond markets where the terms are more favourable than in the bank market or where commercial debt is not available due to political risk. For example, Banro Corporation found the bond market more receptive than the bank market when it came to fund the construction of its second mine in the DRC; Tizir Ltd, the mineral sands JV between Mineral Deposits Ltd and Eramet in Senegal, also issued a fixed-income note to fund its project, albeit secured on its downstream asset in Norway. Typically, such funding is only possible where there are existing cash flows in the business and there is strong demand in the fixed-income investor market at the time of issuance.
- **Debt (Bank) –** Producers are able to access a wider pool of debt, including commercial loans where access to cash flows bring the ability to service such debt. A mining company may require working capital to solve cash-flow problems or for a specific acquisition (such as the purchase of equipment) and may seek a loan from its commercial bank. The conditions precedent for such a loan and the security required by the lender will depend on the amount required and the purpose of the loan. There may be significantly less covenants, representations and conditions required than with project financing.

Alternative Financing Options

As a growing number of the mineral basins are developed, exploration activities have been increasingly driven to frontier and remote geographies, which typically result in more expensive exploration programmes. For Nigeria, the prospect of cash flows being a long way off, exploration companies will be entirely reliant on raising adequate finance to complete activities to discovery. In the current environment, where investors are concerned about the level of new supply coming to the market have a smaller appetite for risk, there is less capital available to finance such programmes hence less standard and more unconventional financing is required to develop the sector. Given below are some of the most innovative and effective methods:

Mineral Development Fund

A Solid Minerals Development Fund has been created by the Nigerian Minerals and Mining Act 2007, formalised in 2013 and is set to be restructured.

The main drive of the fund should be development of a pipeline for bankable PPP[28] projects. The fund can provide a mechanism that is independent of annual budgetary cycles to support mining projects, providing capital grants and government guarantees as credit enhancements to improve the commercial viability of projects.

The fund should be utilised towards three main aspects:

- Funding viability gaps
- Backstop for government obligations of mining projects

[28] Public-Private Partnerships

- To directly enhance credit

As a bold step towards demonstrating the government's commitment to the sector, the fund should be relaunched and recapitalised by 3rd party financiers who would drive increased transparency and manage the fund.

Refinancing Mechanisms

The establishment of a mining assets financing and refinancing mechanism would allow for easy refinancing of mining projects after the projects have been successfully completed and become operational. The existence of this facility will encourage commercial banks to lend to mining projects and take construction risks, based on the knowledge that the mine has created it can be refinanced once operation with minimal effort begins. The facility would be established by a Federal Government agency such as the CBN or the Nigerian Infrastructure Fund (under the Nigerian Sovereign Investment Authority). The provision of long-term refinancing mechanisms will encourage medium-term debt funding of projects on the basis of available exit mechanisms. The strategy has been successfully used for smaller scale transactions in advanced jurisdictions such as Canada.

Cash Flow Securitisation

This would involve the securitisation of distinct cash flows from completed and operational mining projects into asset backed securities for investment by institutions such as insurance companies and pension funds etc. The implementation of the cash flow securitisation framework will support the development of exploration assets as the path to positive cash flow has increased visibility.

Royalties/Streaming Agreement

A royalty is a right to receive payment based on a percentage of minerals or other products produced at a mine or of the revenues or profits generated from the sale of those minerals or other products at a mine. Typically a royalty is granted as part of the consideration paid to land owners (either private or public entities) for the mining rights or the interests in land that the mining company acquires, in exchange for capital or as a result of converting some other interest into a royalty, such as a joint venture interest or streaming interest. This can be an attractive source of finance, offering a non-dilutive and non-controlling source of capital and a deferred repayment date only when the project yields revenue. For management, determining the true cost of capital, i.e. the future loss of cash flow, together with the impact on the overall risk of the project can be difficult.

While royalties are used frequently in the mining industry, it is not possible to say that there is a "standard form" of a royalty. The mechanics of royalty will be determined by the agreement between the parties and may vary greatly. However, it is possible to class royalties into four general headings:

- **Profit Based Royalties:** are based on the profit generated by the mining operation; typically net profits. It is important to identify the costs that may be deducted in order to calculate the net profits of the operation. These are generally restricted to the cost of production after capital costs have been fully recovered.
- **Net Smelter Return (NSR) or Gross Revenue Royalties:** are very common royalties for precious metals and are based on the value of production or net proceeds received from a smelter or refinery (or purchaser). The proceeds received from the smelter, refinery or purchaser may be subject to deductions for insurance, transport, refining and smelting costs, sampling and assaying and marketing as set out in the royalty agreement. From the royalty

holder's perspective, an NSR provides an advantage of providing an income stream that is independent of operational costs of the mine, which are totally the responsibility of the payer.

- **Production Royalty (Fixed Rate Royalty):** are less common as they provide a fixed payment per tonne of production and therefore essentially equate to a fixed cost of production without reference to increase or decrease in market prices or operating costs. In certain cases such royalties can make some deposits uneconomical to mine.
- **Royalty in Kind:** such as a stream, grant rights to the holder to take delivery and/or purchase a percentage of production.

There has been considerable industry attention on the growth of royalty and streaming finance available to mining companies over the last year. Significant transactions since last year include entry into the market by the giant Blackrock World Mining Trust following their $110m investment for a 2% royalty deal with London Mining's Sierra Leone Marapa Mine, the continued rise of Sandstorm Gold Ltd who completed a greater number of streaming transactions than the rest of the sector put together and Anglo Pacific Group's $15m royalty investment in Hummingbird's pre-feasibility stage Dugbe 1 project.

Key Streaming Providers include:

- Silver Wheaton Corp (TSX) – number 1 by market value; primarily focused on silver but expanding into gold. 100% of revenues are from precious metals streams
- Franco-Nevada Corp (TSX) – number 2 by market value; streams accounted for 44% of 2012 revenues, primarily focused on gold in North America
- Royal Gold Inc (Nasdaq/TSX) – royalties and streams
- Sandstorm Gold Ltd (TSX) – one of the fastest growing through its exploitation of niche market providing smaller streams. 93% of 2013-2015 revenues from streams; 93% of revenues from gold, 7% from platinum group metals (PGMs) and silver
- Sandstorm Metals and Energy Ltd (TSX-V) – non-precious metals streams including copper, palladium and natural gas

Key Royalty Providers include:

- Royal Gold (Nasdaq/TSX) – one of the oldest royalty companies, also becoming active in streams. 36 producing and 21 development stage assets
- Franco-Nevada (TSX) – 2012 revenues: royalties – revenue-based 42%, profit-based 10%; 44% streams. 75% gold, 14% PGMs, 1% base
- Premier Royalty Inc – newest royalty company to emerge, 60%-owned by Sandstorm Gold
- Anglo Pacific Group Ltd (LSE) – established royalty provider with 21-strong portfolio of producing, development and early-stage royalties. Diversified exposure to coal (64%), iron ore (24%), gold (5%), chromite (5%), uranium, copper, nickel, PGMs and other
- Callinan Royalties Corp (TSX-V) – one producing, two development, 14 exploration assets
- Americas Bullion Royalty Corp (TSX) – precious metal royalties and streams; 32 agreements; able to receive payments-in-kind (bullion instead of cash)
- Royalco Resources Ltd (ASX) – nine royalties in Australia and New Zealand (petroleum, silver and gold); and royalties on exploration projects in Philippines (gold/copper) and Uganda (gold)

Specialised Mining Financing Companies

Apart from building domestic mining financial expertise in a concentrated indigenous company, this represents a medium to long-term solution for dealing with the issue of availability of long-term capital for mining projects in Nigeria. Some of the biggest players in the industry include:

- Tembo Capital
- Arias Resource Capital
- Greenstone Capital
- Resource Capital Funds
- Denham Capital Management

Standby Equity Distribution Agreements

Standby equity distribution agreements (SEDAs), also known as equity line and equity-linked agreements, are facilities, which provide minerals companies with an option to issue shares to a

provider over a certain time period. This gives companies assurance of a future buyer of shares and the flexibility to choose the timing of the issuance.

Such facilities have gained some prominence as a source of finance given the challenging equity markets and have been used in some of the most advanced jurisdictions, although they are still relatively uncommon.

Crowdfunding

The newest alternative financing option is crowdfunding, which has taken off in sectors as diverse as real estate and biotech, but is still slow to be embraced by miners. There are many questions as to how regulators will respond to crowdfunding, but the rise of Internet based financing steeped in social media culture cannot be denied.

Fiscal Terms

In order to attract investment and get mining projects off the ground, Nigeria would have to put in extra effort compared to what it would have needed to do in the pre-crisis period. While commodity prices remain relatively low and mining project margins are thin, investors require extra reassurance that regulatory policies will allow them to operate profitably in the future. It is important to establish the right framework ahead of the next upward investment cycle, otherwise, Nigeria will miss out on the next surge in mining investment. Nigeria needs to stand out among other countries which are more familiar to investors. Thus one of the priorities of mining policies could be to improve Nigeria's ranking in the Fraser Institute Survey of Mining Companies.

One of the key fiscal policy issues highlighted by the Subcommittee of the Economic Management Implementation Team (EMIT) in its 2014 Review is that "multiple taxes introduced at states and local governments levels are inimical to the effort to attract investors into the mining sector." Hence the Subcommittee suggests establishing a Mining Income Tax that would be governed by a Mining Income Tax Act (MITA). It is important to remember that Nigeria's tax regime does not exist in isolation. Tax policy is a crucial part of the overall institutional framework of Nigeria. Even the most thoroughly designed tax code will not achieve significant results if it is undermined by rent-seeking, red tape, regulatory bottlenecks and inefficiencies pervading the overall institutional environment.

Anticipated benefits to the government

An efficient fiscal regime is the foundation of mining economics: it is key to making mining operations commercially feasible and sustaining government revenues from those operations. Unifying the mining fiscal regime into a mining tax code is the strongest and most efficient way to stabilise mining taxation. A Mining Income Tax Act would eliminate duplications and complexities. By improving tax administration, eliminating bottlenecks and implementing the standards of the EITI, Nigeria will send a strong signal to investors of its commitment to transparency and global good practices.

- There may be a need to review some of the laws as contained in the Mining Act of 2007 as there may no longer be achievable given the current business operating environment. In addition, the lack of enforcement of the enabling laws leads to the failings of the Mining Act.
- The Government could also identify a particular viable mineral resource in which it would concentrate its efforts to set up a legal framework that would regularise the product and project it to the world, with a view to attracting foreign direct investment.

- There is a need for the collaboration of all the ministries to ensure that all the laudable initiatives of the Government in solid minerals work efficiently.
- One major hindrance to development is the total neglect by a new government of the achievements and on-going projects already initiated by the out-going government. Consolidation of gains achieved by previous governments, including continuation and completion of projects should be embarked upon.

Case Studies – African Countries Attracting Mining Financing

Guinea

Recently, Guinea Alumina Corporation SA (GAC), a mining development company wholly owned by Emirates Global Aluminium PJSC (EGA), signed a series of four agreements in Paris, France, with the Government of the Republic of Guinea (GoG) – the latter represented by the Ministry of Mines and Geology and the National Agency for Mining Infrastructure Development (ANAIM).

Investments

In Guinea, the mining sector attracts most of the foreign investment. The main investor countries are China, France and Russia. Guinea amended its mining code in April 2013 in a bid to improve a bruised investment record.

In November 2013, the UAE's state-owned investment fund Mubadala signed a $5 billion agreement with Guinea to develop a bauxite mine at Sangaredi and an alumina refinery in the West African country to secure raw material for aluminium plants. The accord includes $1 billion for extraction and exports of bauxite to the UAE as well as a $4 billion aluminium refinery and a port. In addition to the US5billion FDI inflows over eight years, the investment is said to create 14,000 direct and indirect jobs.

Democratic Republic of Congo (DRC)

In September 2007, a deal was signed between two Chinese state construction companies and the DRC's state copper company in which resources would be exchanged for infrastructure. The deal was worth more than the DRC's state budget, and was the largest of its kind at the time.

The Chinese partners are set to provide $9 billion in financing, while a 19% "internal rate of return" has been pledged. However, little information is publicly available about financial aspects of the deal, including the sales price of minerals, as well as the planned cost of the infrastructure projects. The Chinese involvement in the DRC is expected to be a significant source of FDI in the medium to long-term. Not only is China set to invest heavily in the mining industry, but public-private projects are being implemented as part of a joint agreement. Chinese assistance is expected in the form of both grants and interest-free loans in exchange for mineral resources. This distorts the line between FDI and transfers, as infrastructure is being built in exchange for mining proceeds.

Beijing will build or rehabilitate some 3,500 km of roads and 3,200 km of railroads, 32 hospitals, 145 health centres and two universities in the country. Gecamines, the state-owned mining company, will then in turn cede a potential 10.6 million tonnes of copper and 626,619 tonnes of cobalt in the Dima mining complex to the joint venture, Sicomine. More recently, the joint venture has been rephrased and the expected disbursement of the related public infrastructure loans has also been re-profiled.

The period over which the loans will be disbursed has been extended, with the last disbursement now expected in 2019, while the amount of each disbursement is also smaller than initially projected.

Investments

The civil war between 1994 and 2002 resulted in the hampering of economic growth and discouraged foreign investment. Economic mismanagement over the period resulted in disruptive fiscal and monetary cycles, loss of hard currency through falling export revenues, financial meltdown and hyperinflation. This cycle, in turn, led to a virtual halt in private and public investment. However, the country tackled this by adopting the Mining Code in 2002 (with the help of World Bank, to promote private investment in the country's mining sector), which resulted in the resumption of investment flow.

With regard to investment projects, Ivanplats' discovery of Africa's largest high-grade copper deposit and the world's largest undeveloped high-grade copper deposit in the DRC has immense potential to increase FDI. According to Ivanplats, the current base-case involves a five million tonne a year mine plan. However, the company stated that mining rates of up to 20 million tonnes a year were believed to be possible. This has great potential to attract FDI over the medium to long-term, with benefits potentially spreading to the rest of the economy. Furthermore, the planned upgrades by Ivanplats of the Mwadingusha and Koni hydroelectric plants would provide required infrastructure and supply clean energy to the power grid. In addition, about 60% of the bulk earthworks at copper producer Tiger Resources' Kipoi Stage-two solvent extraction and electro-winning plant development project have been completed. Construction on the $30 million facility started on 16 January 2013, and was on schedule for first production of copper cathode in mid-2014. South African cement firm PPC Ltd also plans to enter the DRC with a $200 million cement factory. The one million tonne cement factory should begin cement production by the fourth quarter of 2015.

The mining sector is expected to remain the main FDI draw card over the short to medium-term. Indeed, expansion of the copper-cobalt Tenke Fungurume mine was one of the most significant investments into Africa in 2012, and is currently the largest private foreign investment in the DRC. In turn, profit repatriation by mining companies could also explain the spike in outward FDI in 2012. Mining exploration subsidiaries in the DRC are funded by parent companies that recoup investments in the production stage, which are counted as FDI outflows according to UN statistics. In addition, cross-border investments by DRC-based mining companies would also have contributed to the increase in FDI outflows in 2012. In recent years, China has emerged as one of the main investors in the DRC. About 80% of the mineral-processing plants in the Katanga province are owned by Chinese companies and nearly 90% of the minerals extracted from these mines are exported to China. Investment into the sector will be dependent on commodity prices, as these have an impact on expected future returns.

Cameroon

Recognising the potential of mining companies in developing hydropower, the government has taken a forward-looking, inclusive approach, involving the mining companies and other large electricity users in developing the new Electricity Act, which became law in December 2011. The deepening of power–mining relationships will yield substantial benefits for the country, the mining companies, the electricity supplier, and the currently dormant Central African Power Pool (CAPP). Mining companies will benefit from the large planned power projects and they are likely to contribute to the initial investment capital requirements given a clear regulatory framework.

Investments

Cameroon is endowed with vast mineral deposits, and the government has now started to explore these resources with the help of foreign investors, including numerous companies from Asia, especially China, after the Cameroonian government identified the development of the mining industry as a priority as the country strives to achieve key economic goals by 2035.

IMIC, which agreed to acquire Afferro Mining in a $190 million cash-and-paper deal in 2013, had earlier acquired a 3.9% stake in the company for $3.1 million in July 2012. Previously, Afferro Mining was also in talks with Jindal Steel and Power (JSPL) for a similar acquisition, but negotiations ended in February 2013.

Korean steelmaker POSCO signed a Memorandum of Understanding (MoU) with Afferro Mining in February 2013. POSCO intends to make a project-level investment in Cameroon, through its 100 percent-owned subsidiary POSCO Africa. Under the MoU, POSCO would also facilitate funding for infrastructure and project development concerning Afferro's (now owned by IMIC) Nkout, Ntem and Akonolinga iron ore projects in Cameroon. POSCO also signed an agreement with the Cameroonian government to build a state-owned steel factory; however, this is still pending a feasibility study and further agreements. According to the Secretary of State, the factory will help Cameroon process 15 percent of all the ore mined in Cameroon, respecting the mining code.

Sundance Resources, which is developing the Mbalam iron ore mine, had previously been approached by Hanlong Mining Investments Ltd with a 100% acquisition offer of about $1.19 billion. However, the offer was terminated in April 2013. Nevertheless, Sundance resources seems intent on exploiting the vast potential at Mbalam and has opened up a tender process to build the railways in order to transport ore to the new deep-sea port at Kribi.

China's Sinosteel is expected to invest $660 million at its Lobe iron ore deposit in Cameroon. As per the Secretary of State at the MMITD Sinosteel Cam, a unit of Sinosteel would sign a development deal with Cameroon under which it would construct a port at Kribi at a distance of 40 km from the iron ore mining project. The project is expected to produce 4 million tons p.a. over a period of 25 years. Feasibility studies for the project have been conducted.

Canada signed a foreign investment promotion and protection agreement (FIPA) with Cameroon in March 2013. FIPA is a treaty that aims to promote and protect Canadian investment overseas through legally binding provisions. According to the Minister of International Trade, Canada, there is major potential for Canadian investment in Cameroon, specifically in the mining, oil and gas, infrastructure, education and health care sectors. In 2011, Canadian mining assets in Cameroon were valued at above $35 million.