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**AN ECONOMIC ANALYSIS OF NATURAL RESOURCES SUSTAINABILITY  
FOR THE MINING SECTOR COMPONENT - NIGERIA**



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 FOR THE MINING SECTOR COMPONENT - NIGERIA  
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## TABLE OF CONTENTS

<b>1.0</b>	<b>INTRODUCTION .....</b>	<b>9</b>
1.1	Background to the Study .....	9
1.2	Objectives of the Study and Terms of Reference.....	9
1.3	Scope of the Study .....	10
1.4	Methodology .....	13
1.4.1	Documentation Review.....	14
1.4.2	Meetings & Consultation with Stakeholders .....	14
<b>2.0</b>	<b>THE NIGERIAN ECONOMY IN PERSPECTIVE .....</b>	<b>15</b>
2.1	Introduction .....	15
2.2	Overview of the Nigerian Economy .....	15
2.2.1	Features of the Nigerian Economy .....	16
2.2.2	Doing Business in Nigeria .....	18
2.2.3	Emergence of Nigeria's Economic Crisis .....	19
2.2.4	Policy Changes Since 1999.....	21
2.2.5	Infrastructure – Taken from Library of Congress Country Studies Series Nigeria .....	25
<b>3.0</b>	<b>THE SOLID MINERALS SECTOR IN THE NIGERIAN ECONOMY .....</b>	<b>28</b>
3.1	Introduction .....	28
3.2	Solid Mineral Exploitation and its Contribution to Economic Development.....	28
3.2.1	Solid Minerals in Economic Theory .....	29
3.3	Historical Review of the Solid Minerals Sector .....	35
3.4	Stock of Solid Minerals in the Country .....	38
3.4.1	Output of Solid Minerals in Nigeria .....	40
3.5	Comparative Analysis of Solid Minerals in Nigeria with Sub-Saharan Africa and Other Emerging Producing Countries .....	43
3.6	The Role of the Financial Sector .....	45
<b>4.0</b>	<b>INTERNATIONAL PERSPECTIVES ON SOLID MINERALS .....</b>	<b>47</b>
4.1	Introduction .....	47
4.2	The Political Economy of Solid Minerals Trade.....	47
4.3	The Solid Minerals Market Place.....	48
4.4	Mineral Pricing .....	51
4.5	Mining Investment .....	54
4.6	Artisanal and Small-Scale Mining Operations .....	59
<b>5.0</b>	<b>THE ECONOMICS OF SOLID MINERALS .....</b>	<b>61</b>
5.1	Introduction .....	61
5.2	Economic Efficiency of Solid Minerals Operations .....	61
5.2.1	The Nature of the Production Function.....	61
5.2.2	Indices of Efficiency .....	62
5.2.3	Time Lag.....	62
5.3	Revenue and Related Issues in Solid Mineral Operations.....	63
5.4	Infrastructural Facilities and the Solid Minerals Sector .....	64
5.5	Solid Minerals Sector and Sustainable Environment .....	65
<b>6.0</b>	<b>THE REGULATORY FRAMEWORK.....</b>	<b>66</b>
6.1	Introduction .....	66
6.2	Constraints Facing the Solid Minerals Sector (1962 – 1998).....	66

6.3	Development of Policies for the Solid Minerals Sector .....	67
6.3.1	Solid Minerals Policies 1987-98 .....	68
6.3.2	Policy on Solid Minerals 1999-2003 .....	68
6.4	Incentives to Solid Minerals Investors .....	69
6.5	Appraisal of the Achievements the Current Administration in the Solid Minerals Sector.....	70
<b>7.0</b>	<b>CHALLENGES OF THE SOLID MINERALS SECTOR .....</b>	<b>79</b>
7.1	Introduction .....	79
7.2	Universal Challenges in the Global Mining Sector .....	79
7.3	Challenges in the ASM Sector.....	83
7.4	Financing the Sector: - Local and International.....	86
7.5	Capacity/Integration of Approach/Risk .....	89
7.6	Particular Challenges Identified in Nigeria .....	90
7.6.1	Attracting Foreign Direct Investment .....	90
7.6.2	Extent of Geological Knowledge of Solid Mineral Deposits .....	91
7.7	Developing the Local Mining Sector .....	93
<b>8.0</b>	<b>SUMMARY OF FINDINGS, RECOMMENDATIONS AND CONCLUSION.....</b>	<b>96</b>
8.1	Summary of Findings.....	96
8.2	Recommendations.....	98
8.3	Conclusions .....	99
<b>9.0</b>	<b>REFERENCES .....</b>	<b>101</b>

## LIST OF TABLES

Table 2.1:	Poverty Statistics .....	17
Table 2.2:	Stability Index .....	18
Table 2.3:	Doing Business in Nigeria 2007 - Results .....	19
Table 3.1:	Contribution of Mining and Quarrying to GDP .....	37
Table 3.2:	Contributions of Solid Minerals to Nigeria's GDP.....	37
Table 3.3:	Mineral Groupings in Nigeria.....	39
Table 3.4:	Distribution of Solid Minerals in Nigeria by States .....	40
Table 3.5:	Principal Solid Mineral Production (Tonnes) .....	42
Table 3.6:	Contribution of Solid Minerals to the Economies of Selected Sub-Saharan African Countries 1987.....	44
Table 4.1:	Questions to be Answered Before Investment.....	55
Table 6.1:	Participating Agencies in OSIC .....	77
Table 6.2:	Achievements of OSIC 2006/07 .....	78

## LIST OF FIGURES

Figure 2.1: Selected African Countries: Real GDP, Consumer Prices and Current Account Balance .	24
Figure 3.1: Timeline of 'Key' Developments in Solid Minerals .....	36
Figure 3.2: Estimated Production of Mineral Commodities .....	43
Figure 4.1: Typical supply & demand factors affecting a mineral resource (after World Nuclear Association) .....	50
Figure 4.2: Typical Commodity Performance Graphs .....	53
Figure 4.3: Global Corporate Mining Sector – Firm Size and Organisational Focus .....	56
Figure 4.4: Economic Contributions Made by Rio Tinto Plc.....	58
Figure 4.5: Illustration of Value Added to Direct Suppliers Element .....	58
Figure 6.1: Entries in Mining Cadastre Database .....	73
Figure 7.1: Questions Prior to Commencement of Mining Operations .....	89

## APPENDICES

Appendix 1: Mission Report Notes

## EXECUTIVE SUMMARY

The Nigerian government has acknowledged that the extraction and use of solid minerals forms one of the key sectors for diversification of the economy and is considered to have strong potential to provide an important contribution to economic growth. The World Bank is supporting the government by providing finance for the Sustainable Management of Mineral Resources (SMMR) project.

This study, which is the subject of this report was commissioned as a sectoral component part of the overall economic analysis of natural resources and helps to strengthen the links between the mining sector with the economy and the environment. The study, carried out between February and April 2007, specifically addresses the prospects of developing an industrial mining sector in Nigeria. The current mining sector is dominated by small-scale operations, working below their full potential and literally scratching the surface. Preliminary investigations indicated a lack of up to date information on deposits and lack of microeconomic information on the feasibility of extraction.

The report firstly presents an analysis of the Nigerian economy as the environment within which the solid minerals sector is situated. It discusses the economy in terms of its distinguishing characteristics, structure and related issues, such that the place of the solid minerals sector can be appreciated. An examination of policy issues and economic reforms to aid the development process is also presented.

Solid minerals extraction plays a vital role in the economies of many sub-Saharan African countries and the wealth generated from this activity contributes significantly to their exports and revenue generation. It has been shown that, providing appropriate legal and policy frameworks are in place together with an adequate level of political stability, investors will be drawn to rich mineral deposits. Over the past 15 years, enabling frameworks have been developed and established. This has resulted in substantial inward investment flow to those countries wishing to benefit from mineral extraction whilst creating long-lasting benefit to the local communities involved. It is however, important to provide a realistic assessment of the prospects for and impacts arising from mineral exploitation. The report examines these in detail, highlighting both the opportunities and challenges posed. Several theses are assessed and guidance is given but whether the benefits of mining outweigh the costs is specific to a country and its people. The management of mining and mineral wealth by government, companies and society is crucial to ensuring that the potential embodied by minerals in the ground is realised.

It is evident from the study that Nigeria stands to benefit from a developed solid minerals sector. A historical review of the attempts made by government to control the sector indicates that they have been largely unsuccessful for a variety of reasons outlined in the report. The contribution of the mining sector to GDP is pitifully small (0.39%) especially when compared

with other African countries over the same period. Objectives and policies have changed towards becoming administrator/regulator.

There would appear to be a substantial and widespread mineral endowment in the rocks of Nigeria, most of which is as yet untapped. Nigeria compares unfavourably with its sub-Saharan neighbours in respect of GDP and export value generated from solid minerals. The range is considerable from a high of over 40% of GDP in Botswana to less than 1% in Nigeria. Export earnings of over 50% were generated in Democratic Republic of Congo, Namibia, Botswana and Zambia and 12 other countries gained over 20% of export earnings from solid minerals in comparison to Nigeria's 0.4%, during the same period.

Recent increases in exploration and expansion of mines throughout Africa have concentrated on gold and diamonds but improving base metal prices has generated exceptional levels of activity. Attracting investors into large-scale development requires sound government and a well founded financial sector to implement economic programmes for the private, non-oil funded growth, poverty reduction and job creation. The Central Bank of Nigeria is leading the process of banking sector reform to ensure confidence.

Nigeria has to compete to attract investment in a global market. As a result, the report discusses the distribution and pattern of global trading together with the likely investment decisions taken. A major focus of the study was directed towards the political economy of solid minerals trading, the market place, pricing methods and investment for large and small-scale operations.

The pattern, in terms of products and location of mineral development is dynamic. World trade relationships between suppliers and consumers have always been relatively dynamic and volatile. Cyclical trends in the economy have been the most significant factor affecting the supply and demand for minerals. The present value of a mineral is governed by supply and demand which is influenced by world affairs and the availability of a reliable source of mineral of the correct quality. In 2007, the current picture is one where global commodity markets have continued to experience strong demand growth, primarily driven by the emerging economies of China and India. These developing economies are growing at rates much faster than the western world and are a sustaining force behind increased global demand for a wide range of mineral commodities.

Since the mining industry is global, mining companies will seek to make their investment in the most conducive climate consistent with level of risk. The task of any country wishing to attract, stimulate or retain foreign direct investment is to adopt appropriate Government policies and programmes to:

- implement a policy framework to ensure mineral wealth is captured & creates long lasting benefit for local community and population;

- maximise 'value-added' from minerals extraction;
- ensure stable security conditions;
- regularise and aid existing ASM production under Govt. control;
- resolve national v local authority, social tensions, and
- provide means of dispute resolution.

In continuation the report focuses on the economics of solid minerals, against the backdrop of the realisation of the distinguishing features of solid minerals. These include

- they are depletable and non-renewal;
- their exploitation generates spill over costs or externalities;
- their exploitation is against the realisation of sustainability in their usage i.e. the trade-off between current and future generations;
- the sector can be enclave; and
- their prices are subject to fluctuations in the world market.

Accordingly, the report considers the issues of efficiency with respect to solid minerals, revenue issues in solid minerals; infrastructural facilities in solid minerals exploitation, environmental issues and sustainability.

The efficiency of operations is treated in respect of production function, profitability, time lag and stock of mineral resource. At present there are no large-scale mining operations being undertaken. There is a low skills base, technology and experience is at a basic level. Finance capital is not available to small-scale operators on a scale which is an obstacle to the transition to a large-scale operation. Information on resources and reserves is not readily available.

The development of policies, designed to ease the constraints facing the sector were slow to evolve, but by 2003 a policy framework was in place. The regulatory framework is improving, but there is still much to be done to make it wholly attractive and there are many statutory instruments remaining to be passed and implemented.

The reform measures introduced in 2005 are improving the ministry's effectiveness. The four technical departments have a clear and appropriate strategy. There is an increase in applications for licences/leases indicating a rising interest in solid minerals with over 2000 new registrations recently entered into the database. However, these are held in the system until the enactment of the new mining law. The MCU operates in an efficient and transparent manner.

Mineral returns have been processed since 1997. However it was noted that old data is likely to have been underreported especially in the informal mining sector (estimate 70%), due to lack of close inspection; self submission and dishonest disclosure of volumes extracted. All

current mining activity is ASM by type consequently, the need to establish a separate department dealing with the affairs of the ASM sector was recognised. Policy development involves the formalisation of the informal mining sector, encouraging co-operatives, receiving applications for registration, helping to empower by facilitation of external services and finance. Sub-offices are based in 14 states. The establishment of Buying Centres for mineral product are being encouraged aimed at adding to the knowledge of market behaviour and improving the market chain process. Another important achievement of the administration is the organization of ASM miners into cooperatives, small scale industrial concerns and companies.

The newly established Nigerian Investment Promotion Commission (NIPC) provides a 'one-stop-investment-centre' to facilitate FDI, for investment in Nigeria. The MMSD are present at the centre which has serviced approx 100 FDI mineral enquiries in 2006 and over 20 in the first quarter of 2007. Investment incentives for solid minerals are seen as attractive in comparison to other global competitors.

Mining companies are considered to be 'frontier' companies". They are usually the first to invest in politically sensitive or recently reformed countries but this is not without significant challenge. Half the countries with large mining sectors are considered to be 'low income countries' in Asia, Latin America and Africa. Mining has the potential to bring extensive economic benefits by attracting substantial FDI, providing that an appropriate legal and policy framework is in place, an adequate level of political stability exists, and that property rights are well defined. The opportunities that an established mining sector, irrespective of size of operation, can provide are foreign exchange earnings, revenues, jobs, education, skills and infrastructure improvements.

The study comments in particular on the following challenges:

- Viability of the industry;
- Control, use and land management;
- Minerals and economic development;
- Integrated approach to using minerals;
- Sector governance;
- Access to information;
- Local communities and mines;
- Environment, and
- Artisanal and Small-Scale Mining.

The level and amount of international mining investment has been increasing year on year since the mid 1990's, due to the potential for high returns, demand for metals and the need for diversification of risk by multinational companies.

It is accepted that lending institutions have to be able to make independent decisions and charge interest rates which are sufficiently high to cover inflation and operating costs, including loan losses, and also have enough clients to permit economies of scale.

Whilst, government leadership is essential to enable mining permits, exploration, credit and markets to be found the formation of consultative groups between ASM the financial agencies and government can be successful in providing and directing the necessary technical and financial assistance. Given the correct support and guidance, where needed, ASM operations have the potential to provide an income to the workers and an economic boost to the area. Whilst the strategy for assessing the techno-economic environment under which large scale mining operates, is well documented, the circumstances of small-scale mining are somewhat different. In many respects the same factors need to be addressed - to submit full details of mining and processing methods and technology, the financial package, an environmental management plan and the training and local benefits to achieve sustainability. Some ASM miners who have a mineral operation and deposit, which has the potential for increased production, do not have enough money for improving mining and processing equipment. They may therefore, face a situation where they have to sell their operations rather than being able to develop it themselves.

In terms of investment in the minerals sector, continuity, stability and consistency of approach to mineral development by the government is crucial. There should be:

- Clear mining rights and title;
- Clear tenure and control;
- Attractive and competitive fiscal conditions;
- Political transparency and stability;
- Good communications and infrastructure; and
- Reinforced institutional capacity.

To gauge opinion of potential overseas investors with regard to investment into mining projects in Nigeria, formal and informal interviews were sought with a range of stakeholders in the international mining sector. The opinions are summarised below:

- lack of a recent successful track record of large scale mining;
- promotional events are helping to spread knowledge;
- geological understanding is poor;
- mining potential unproven;
- main interest is in metals (precious, base, ferrous and non-ferrous);
- if project is good enough and financially sound, funds can be found;
- reliable, well established in-country partner, with technical knowledge is required;
- geological and financial risk can be factored into project appraisal but political risk is considered to be uncertain;

- comparable projects in other countries may be favoured, due to perceived political instability in Nigeria;
- encouraged that regulatory framework is being updated and should be conducive to mining investment, but the application has not been tested over time;
- advantages to be had by 'first movers' as small or medium sized exploration companies, promoters or speculators;
- media coverage led to concerns over corruption, violence, security, political stability and transparency;
- infrastructure problems with electricity supply, water supply and fuel supply being the most critical elements;
- no objections to investment in Nigeria *per se*.
- volatile security situation, particularly for foreign nationals;
- privatisation process not complete, new laws untried
- shortage of trained and experienced mining workforce; and
- lack of access to local capital.

The National Miners Association (NMA) expressed the views of current operators and the problems that they face, namely:

- Lack of access to finance;
- Communication;
- Trespass by informal operators;
- Stagnation;
- Lack of technical and business knowledge and support;
- Lack of investment in modern equipment;
- Export documentation slow and cumbersome;
- Introduction of new legislation;
- Seasonality; and
- No added value retained.

The efforts by the government to attract local and foreign investors is set to continue, but except for a few commodities, the extent of the countries mineral resources are not considered to be of sufficient size to attract international interest. The majority of the country's geological knowledge and data collation is very dated and until recently, the issue has not been addressed. The computerisation of data, large-scale geological mapping, geochemical sampling and airborne geophysics has not been completed consequently the risk for an explorer is much greater. Undertaking such work is standard procedure for countries interested in promoting their mineral potential. Foreign interest increase when a full suite of information is available.

The prospects for the development of the solid minerals sector in Nigeria are good. Comparative studies indicate potential for accelerated, sustainable, pro-poor and non-oil private sector growth. The specific economic benefits are an increase in solid minerals production considerable positive impact. The existing value of mineral production and hence the projected increase in value retained in the short-term is difficult to determine, since statistics are unreliable with much of the production being unreported. There is insufficient data currently available, in respect of the geological/resource knowledge of particular mineral deposits and the market potential, for this study to define the most attractive solid mineral prospects.

Macroeconomic and sectoral policy dialogue should continue to support the alignment of the reform of the mineral sector in parallel with efforts to maintain appropriate policies. It is also necessary to provide technical and microeconomic assistance to the ASM co-operatives and financial sector. While NEEDS provides legal protection for and improves access to minerals by ASM which can contribute to an increase in living standards, but capacity needs building in the ASM sector if deposits are to be worked efficiently, effectively and without causing waste to the resource. A focus on capacity building in the sector is essential in the following areas:

- Project planning, valuation and costing;
- Financial management and budgetary control, leading to the formulation of business plans;
- Risk assessment;
- Basic geological knowledge to understand the mechanisms for control and direction of mine workings;
- Market situation analysis, structure, behaviour and opportunities, and
- Means of adding or capturing value within the country.

Pilot projects and demonstration programmes should be identified for targeted mineral undertakings where these would realise the greatest benefit. A situation analysis of the market cluster for targeted minerals will help to develop product knowledge, quality requirements, supply and demand characteristics in order to better position the sector.

The proposed regulatory framework is conducive to attracting interest in the development of the sector but needs a speedy implementation of the new Mining Law and regulations. A consistent and transparent application of the regulations and policy will be required. Long term investment decisions need to be taken for the promulgation and realisation of solid mineral projects. The institutions have a role to play in ensuring finance is made available and that incentives continue to be attractive to potential investors. The 'one stop shop' approach adopted by the NIPC and MMSD provides a sound basis for attracting inward investment and facilitating the permit process. Improvement in competitiveness to attract private investment and improvements in the administration of mineral rights and operations

will result from the continuation of the process of revising and modernising the legal and fiscal arrangements for mining and by strengthening good governance.

Appropriate and transparent revenue sharing schemes and management systems could be introduced to ensure correct control and distribution of derived rental income.

Within a satisfactory investment climate there is potential to raise foreign direct investment for large scale mining projects into US\$ hundreds of millions of production value in the near term and the realisation of an increased focus towards mineral production from the ASM operators could aid poverty alleviation and increase economic development in rural areas.

## **1.0 INTRODUCTION**

### **1.1 Background to the Study**

Mining is one of the oldest economic activities in Nigeria, dating back to 340BC. Early mining activity involved the extraction of gold and metallic substances. Most states have identified extensive mineral resources however, most of this is un-quantified. Apart from oil and gas, which are obviously the most important mineral resources in the country, but have a more limited direct impact on people's livelihoods and day-to-day lives, other mineral resources are very important to a large share of the Nigerian population. The solid minerals sector is currently underexploited and a study of the sector forms part of a broader attempt by the World Bank to analyze key issues in natural resource management, with emphasis on the economics and regulatory aspects of their utilization.

The Nigerian Government has acknowledged solid minerals as one of the key sectors for diversification of the economy and has the potential to provide an important contribution to economic growth. The importance of the mining sector is also outlined in the National Economic Empowerment and Development Strategy (NEEDS), which in 2004, set out the foundation for sustainable poverty reduction, employment generation, wealth creation and value re-orientation within the country. The World Bank is providing support to the sector by providing finance for the Sustainable Management of Mineral Resources Project (SMMRP), financed by the International Development Association (IDA). The main objective of this project is to increase the government's long-term institutional and technical capacity to manage Nigeria's mineral resources in a sustainable way, including the establishment of a basis for poverty reduction, and rural economic renewal in selected areas of the country, via the development of non-farm income generating opportunities, through small-scale mining, seeking to diversify from oil sources of income. This project focuses on improvement in sectoral government and transparency, the organization of artisanal and small-scale mining (ASM), for poverty reduction, and the creation of an enabling mining environment for large-scale miners. It is intended to increase the government's long term institutional and technical capacity to manage Nigeria's solid mineral resources in a sustainable way, and to establish a basis for poverty reduction and rural economic renewal in selected areas of the country by generating opportunities in ASM. The project has three components:

- Strengthening governance and transparency in mining;
- Private sector development; and
- Economic development and diversification in ASM areas.

### **1.2 Objectives of the Study and Terms of Reference**

The expected development of solid mineral resources resulting from the SMMRP will have future impacts on the economy, environment and society. As a result, the World Bank and

the Federal Government has commissioned this sectoral component of the economic analysis of natural resources to ensure sustainability of the mineral sector development in the country.

The study is considered to be important from two different perspectives. First, solid mineral resources are economically, socially and environmentally crucial for Nigeria. There are key knowledge gaps in the sector. In addition the utilization of solid mineral resources is well aligned with the Bank's Country Partnership Strategy, which is placing a strong focus on non-oil growth sectors of the economy. The other perspective comes from the environmental sector: the Bank has just completed the CEA (Country Environmental Analysis) and the idea is to continue the policy dialogue with the mining sector, and to help strengthen its links to the economic sectors where the environment is important. This study provides a major opportunity to carry this out.

The main audience for the study is formed by the Ministries of Planning and Finance, the National Planning Commission, the Federal Ministry of Mines and Steel Development, the Ministry of Environment, as well as other sector Ministries and agencies at Federal, State and Local levels. Apart from government, private sector investors and mining communities are also likely to be interested in the results of this study. The study should be of interest also to the national utilities and the public at large. The study should of course also be relevant to the Bank and agencies involved with the existing Mining Sector Project, as well as the Nigeria Country Team more broadly, in its partner work with the government to work on the non-oil sectors.

The primary objective of the study is to assess the prospects of an industrial mining sector emerging in Nigeria given what is known about the country's geology and mineral endowment as well as economic, institutional and other factors. The key question to be answered at the moment is thought to be 'why is there not a larger mining sector in Nigeria and is one likely to develop in the next decade?'

### **1.3 Scope of the Study**

The mining sector in Nigeria is currently dominated by small-scale enterprises, divided into artisanal operations that rely on manual labour and simple tools, and small-scale operations (formal activities) with higher volume outputs and small degrees of mechanization. In most cases, mining operations are not only exploited below their full potential but also lead to significant social and environmental degradation.

Most artisanal mining is characterized by poverty (about 70% of Nigerians live under 1US\$/N140/day), seasonality and illegality. The government indicates a figure of 210,000 miners, of which about 90% are currently informal. Another 200,000 (mainly household farm

workers) are estimated to rely upon income from part-time mining to supplement income from agriculture.

A New Mining Code has been submitted to the National Assembly proposing a major transformation of the role of Government from owner-operator to regulator-administrator. Under the Constitution, the Ministry of Mines and Steel Development (MMSD) has overall responsibility for the control and management of all mineral resources in the country. In 2005-06 the Federal government produced a new National Policy for Solid Minerals Development linked to the new regulatory framework and mining code. The MMSD consists of:

- An independent Mining Cadastre office, responsible for granting mining titles and with exclusive powers to suspend and revoke titles;
- The Mines Inspectorate Office, responsible for the enforcement of legislation and collection of royalties;
- The Mining Environmental Compliance Department responsible for all environmentally related mining issues; and
- The Artisanal and Small Scale Mining Department, responsible for the organization and encouragement of small scale miners.

The Federal government of Nigeria have expressed their intention to drive the process of change and development of the mining sector. With the help of the World Bank, Nigeria is poised to “market” its mining sector to the extent that it is/becomes a competitive and healthy economic sector. Nonetheless, there are important knowledge gaps regarding the basic (macro) economics of the mining sector in Nigeria.

The formal mining sector in Nigeria is very small. The country has some potentially promising deposits of iron, coal, lead/zinc, and other minerals, but these have generally not been explored or developed by the world mining industry, as evidenced by the absence of major foreign mining operators in Nigeria. There are small scale operations producing gold and gem stones. There is also mining of industrial minerals such as barites and gypsum, but these are mostly related to the local construction and oil industries. These minerals have remained untouched by foreign operators, despite a strong Government push (i.e. import ban) to develop the domestic industrial minerals sector to supply the local industry (mostly, barite production to supply the oil industry). The same applies to coal and other minerals.

Preliminary information, based on discussions with Nigerian authorities, suggests that two factors constrain attempts to carry out a detailed assessment of prospects for the development of the mining sector: (i) the need to rely upon dispersed and outdated information, and (ii) a lack of microeconomic information on the feasibility of the various minerals – reserves, costs of exploration and exploitation, appropriate scales and technologies, etc. The Ministry of Mines and Steel Development confirmed that it would

provide all necessary support to this study in terms of giving access to the available data and information, so that a good assessment of the mining sector economics in Nigeria can be made using the best information.

The issues to be addressed in this study are:

- Given what is known about geology and deposits, what are the prospects that Nigeria will be able to develop a mining sector that is significant in relation to the world market or the national market? For what minerals are the prospects most favourable? How do these prospects depend upon local demand and market potential – either in Nigeria or in West Africa – or on the growth in world markets? If there is the possibility of developing certain deposits for the world market, how do the basic economics of development and extraction compare with the current situation and expected trends in other major producing countries - e.g. coal in Australia and South Africa, iron ore in Brazil and Australia, etc?
- How far does access to appropriate infrastructure constrain the development of existing and new mining operations? What investments and operational changes would be required in order to make mining of different minerals and in different locations economically viable or, even more, internationally competitive? What types of infrastructure – water, power, transport or ports – represent the most important constraints for production at a national or regional scale or for production on an international scale?
- The new regulatory framework has been designed with the goal of providing sound incentives for attracting investment by private companies – either national or foreign – into the development of mineral resources and the efficient extraction of minerals from existing or new mines. How is the new framework viewed by potential investors and how might it be fine tuned to achieve its objectives? Some issues have been identified which may give rise to difficulties in future. What measures should the Government take to reduce uncertainty and improve outcomes under the new regime?
- *Undetermined Government fees and taxes.* According to the proposed regulations, applications and transactions requiring State Government involvement include payment of fees “as determined by the State Government”. What guidelines should be established to minimize uncertainty and opportunities for rent seeking at State level while providing an appropriate share of resource rents to communities and States?
- *Absence of a one-stop shop for obtaining licenses.* While the MMSD is responsible for granting a final license, it is the responsibility of the project promoter to obtain “all required licenses and agreements”, whether they are with local communities, State Governments, private interests, or other Federal Government Agencies. This is likely to cause substantial delay and difficulties. How far would it be possible for the MMSD to provide a one-stop shop for issuing licenses?

- *Security of Tenure.* All land and all mineral resources in Nigeria are owned by the Government. The Federal Government has the power (a) to acquire land under which minerals have been identified in commercial quantity and (b) to award titles. Titles are granted based on a variety of criteria, including proof of technical competence and financial status. Applicants can be foreign companies, although the registration process is lengthy and expensive. The House Bill attempts to shore up tenure security by creating multiple categories of rights to minerals, setting short deadlines for application approval, lengthy terms for the rights, and unambiguous requirements for maintenance for each type of right, and clear penalties for failure to comply with the terms of the House Bill. How effective are these measures as perceived by private companies?
- *Vulnerability of artisanal and small-scale miners.* The proposed regulations promote the formation of cooperatives of small miners, as well as the creation of buying centres, in an attempt to overcome their exposure to middle-men who end up capturing most rents from the activity, a phenomena neither unique to Nigeria nor to the mining sector. Is it realistic to think that the role of intermediaries can be limited so that more of the resource rents from small-scale mineral production accrue to miners? What measures in terms of providing access to finance, technical assistance, etc are required to convert this goal into reality?
- Analyze the links between large and small scale activities in terms of complementarities and eventual trade-offs between their social (income and employment) and economic (efficiency) benefits. While the new regulatory framework focuses more on attracting the larger-scale segment of private companies, the social benefits of the sector in terms of job opportunities and poverty reduction are perhaps equally or more important in Nigeria than the eventual income generated by the sector. A particularly important indicator to analyse is the impact of mining operations on poverty. There are no economic studies in the country analyzing the links between ASM, small scale, and large scale mining operations with poverty. Does in fact ASM more directly and sustainably help reduce poverty? How does it compare with larger scale mining operations? While a detailed and formal analysis would go beyond the scope of the proposed study, given the enormous data requirements and difficulties in measuring factors, an overall assessment of the issue based on existing data and evidence from experience from other countries would be an important element of the study.

#### **1.4 Methodology**

The project was carried out over a 3 month period from February to April 2007, with 13 days in country, 3 of which were spent in the field. Data gathering involved a review of documentation, meetings and consultation with stakeholders and field visits to selected sites as described below.

As with any project of this sort, this study is dependant on the data available or provided by others. The objective is to gain an overview of the Nigerian mining sector and the challenges it faces. It is not to examine or audit specific sites or mining entities, or to propose site-specific measures.

#### **1.4.1 Documentation Review**

The data used was provided during the consultant's stay in Nigeria, and was compiled through requests made during meetings with various ministries and agencies or that uncovered through research from sources available. The main documentary sources used for the compilation of this report are the seven-year strategic action plan for the development of the solid minerals sector, National Economic Empowerment and Development Strategy NEEDS, 2004, Nigerian Minerals and Mining Bill, 2007 (Harmonized) and Investors Guide to Nigeria (a full list of references is contained at the end of this report). Despite the constraints on compiling data and information in the time and resources available, the consultants consider that it is more than adequate for the purpose intended. Use of the data for purposes other than this must be done with care and with full regard to its limitations.

#### **1.4.2 Meetings & Consultation with Stakeholders**

As part of this study the consultant held the following meetings prior to and during the in-country mission 13 – 25 March 2007:

- Interviews with international mining companies, financial advisors and investors;
- Brief and de-brief meetings with Project Management Unit and World Bank staff, Nigeria;
- Meetings with Nigerian Federal and State agencies, institutions and departments;
- Field visits and discussions with Miners Association of Nigeria, Jos and mining operators in Plateau State, Kaduna and Nasarawa; and
- Meetings with financial services representatives.

The meetings provided an extensive opportunity for dialogue. A full list of meetings attended and notes taken is included in Annex 1.

## **2.0 THE NIGERIAN ECONOMY IN PERSPECTIVE**

### **2.1 Introduction**

This chapter analyses the Nigerian economy as the environment within which the solid minerals sector is situated. It discusses the economy in terms of its distinguishing characteristics, structure and related issues. The objective is that against this backdrop, the place of the solid minerals sector will be better appreciated. Accordingly, the chapter contains an overview of the Nigerian economy;

### **2.2 Overview of the Nigerian Economy**

The description of the Nigerian economy as the biggest in the West African sub-region, or indeed in the Economic Community of West African States (ECOWAS) is apt and justified. Both from the size of the population and the vibrancy of the people and level of endowment, Nigeria has the capacity to influence the activities of the sub-region for good or otherwise. The economy is variously categorized as being unable to realize its full potentials. An expression of frustration, it would seem. This erstwhile colony of the UK, which became independent in October 1st 1960, is a member of the Commonwealth of Nations.

Nigeria occupies a land area of 92,376.5 km<sup>2</sup>, situated between longitude 3<sup>o</sup> and 15<sup>o</sup> E and latitude 4<sup>o</sup> and 14<sup>o</sup> N. It is thus a tropical country. The longest distance from east to west is 767km, and from north to south is 1,605km. The vegetation varies from the Sahel Savannah in the north to the mangrove forest in the coastal areas. The topography consists of rolling plains, mountains/plateau and rivers and lakes. This diversity in vegetation is defined by climate, which is essentially tropical with some temperate patches in the Jos and Obudu Plateau. While some parts of the north experience a single maximum rainfall, the coastal and southern states enjoy double rainfall maxima. As a result grains, root and tree crops thrive in the country. Agriculture is therefore a major economic activity throughout the country. Similarly, the geology, topography, geomorphology and landscape give rise to numerous hydrocarbon and solid minerals.

The country's economy depends heavily on the oil sector, which generates up to 95 % of Nigeria's export revenues, accounts for 85% of foreign exchange earnings and about a third of gross domestic product (GDP). Both the World Bank and the MMSD consider that, with its large reserves of human and natural resources, Nigeria is seen as one of the most promising markets for international companies. It has the potential to build a prosperous economy, significantly reduce poverty, and provide the health, education, and infrastructure services its population needs.

### **2.2.1 Features of the Nigerian Economy**

This section examines those economic, socio-cultural or geographical features that tend to confer uniqueness on the Nigerian economy. The importance of the features of an economy, like the structure, is that they throw more light on the economic activities and improve understanding of the same. In other instances, the features could describe the economic system as the discussion below shows.

- (i) Nigeria is a mixed economy. The economic activities are undertaken in a partnership between the public and private sectors. Characteristically, there are businesses that are owned and operated by the public sector (corporations and public utilities) as well as private limited liability companies, etc. However, it must be noted that in Nigeria the government or public sector is very dominant (CBN, 2000). Since the 1980s the government had started a process of privatizing its corporation in a bold attempt to divest and downsize the public sector.
- (ii) The country is agrarian and a large percentage of the population finds employment which is still crude and dependent on simple traditional farming implements. Although modern farm implements and equipment has been introduced, their usage is still not wide spread.
- (iii) The economy is mono-cultural, as it depends up to 70% on crude oil as a source of foreign exchange earnings and government revenue, dependence has varied from about 90 % in the 1980s to the current figure .This no doubt makes the country very vulnerable to the vagaries of an ever volatile oil market.
- (iv) The industrial base is fragile, backward, underdeveloped and extremely foreign-oriented both in term of capital goods, spares and raw materials. Furthermore the value-added sector is low while the inter-sectoral linkages are weak. This implies that a boom in one activity rarely affects another in the sector; but will rather impact on the foreign economy from where imports were sourced.
- (v) The Multinational Corporations (MNCs) play a critical role in the economy especially in the oil sector where companies like Mobil-EXXON, Chevron-Texaco, Total-Fina, Shell Development Company, Nigerian Agip Oil, and others, dominate. The technology in the sector is foreign and in the event that the companies decide to suspend operations, the economy will grind to a halt. Hence it is said that the oil sector in an 'enclave'.
- (vi) The adult literacy rate is low and in 2003, it was put at 60.6% (female) and 75.7% (male) compared to the world average of 73.1% (female) and 84.6% (male).
- (vii) There is a high level of wastages and unemployment of both human and material resources. Due to the dearth of data, the %age of unemployment is not known. Thus the problem is described in qualitative term.
- (viii) The country's claim to a federation is only in name as the economy's fiscal arrangements are dominated by the central government which controls the other sub-national tiers in terms of the allocation of federally collected revenue or the

capacity of these tiers to take decisions based on their peculiar circumstances. This causes controversy of resource control and the shifting revenue allocation formulae.

- (ix) Nigeria's socio-economic indicators are low and worsening. Nigeria is characterized by low human development as measured by the UNDP's index. The HDI (Human Development Index) which is measured on a graduated scale of 0 to 1, Nigeria's position over a decade has averaged only 0.40, placing Nigeria among the very poor nations. Nigeria ranked 151 (out of 177) in the Human Development Index in 2002 and dropped further to 158 in 2005.
- (x) The country's population is put at over 140 million making it the most populous country in sub-Saharan Africa (SSA). Furthermore, the annual growth rate of 3.0% per annum, over the past two decades makes it one of the fastest growing populations in Africa. The fertility rate is equally high, being 6.0% per adult female.
- (xi) A study by the UNDP (Lagos) in 2000/2001 puts its per capita GDP in purchasing power parity (PPP) terms as \$1,118.00 (male) and \$477 (Female) compared with SSA's figure of \$2,079.00 or \$4,154.00 for South-East Asia or \$6,341.00 for Latin America or the World average of \$8,587.00 (male) and \$4,435 (female) UNDP (2000/2001:67) ;
- (xii) Poverty is widespread with over 66% of the population falls below the poverty line and about 37% live in extreme poverty. Comparable statistics indicate the level of poverty, reinforcing the point made in (xi) above. The country's situation vis-à-vis Egypt reinforces the point.

<b>Issue</b>	<b>Nigeria</b>	<b>Egypt</b>
Lack of access to safe water	51%	9.9%
Lack of Access to health Services	33%	13%
Lack of Access to Sanitation	59	1%
Poorest 20% of Population	4.4	12
Richest 20% of Population	57.3	9.8

Source UNDP Lagos (2001/2002)

- (xiii) There is a high rate of /inadequate infrastructure and a poor maintenance culture.
- (xiv) The economy is highly open, with the openness index of Export/GDP = 27.34 (1975-98); imports/GDP = 20.41% (1975-98); and Trade (imports + exports) /GDP = 47.74% (1975-98) and 71.83% (1995-98).
- (xv) The bureaucracy is seen as self serving, corrupt, inefficient and ineffective.
- (xvi) The economy is equally characterized by political and policy instability as typified by the high turnover of governments, some by forces rather than through constitutional means. Examples below illustrate this point.

<b>S/N</b>	<b>Regime</b>	<b>Tenure</b>	<b>Mode of Exit</b>
i.	Balewa (civilian)	1960-1966	Coup d'etats
ii.	Ironsi (military)	1966-1966	Coup d'etats
iii.	Gowon (military)	1966-1975	Coup d'etats
iv.	Mutala (military)	1975-1976	Coup d'etats
v.	Obasanjo (military)	1976-1979	Coup d'etats
vi.	Shagari (civilian)	1979-1983	Coup d'etats
vii.	Buhari (military)	1984-1985	Coup d'etats
viii.	Babangida (military)	1985-1993	Abdication
ix.	Shonekan (unelected civilian)	1993-1994	Coup d'etats
x.	Abacha (military)	1994-1998	(Death in office)
xi.	Abubakar (military)	1998-1999	Civilian handover
xii.	Obasanjo (civilian)	1999-2007	Civilian-handover

Source: Author's Compilation

The mode of exit of the leader speaks for itself. Table 2.2 indicates a sense of instability, as coup d'etats are not planned methods of changing governments. Suffice to say that the above state of affairs has implications for the economic development of the country.

### **2.2.2 Doing Business in Nigeria**

The World Bank Group and the IFC produce an annual assessment of 175 countries which presents the aggregate ranking on the ease of doing business and on each of ten topics that comprise the overall ranking. In 2006 Nigeria ranked 108 out of the 175 countries surveyed. The results for each of the ten categories are shown in Table 2.3 below. Of particular concern to the proposed expansion of the mining sector are those topics dealing with business start-up (including issue of licences and registration of property), trading across borders and payment of taxes, which show disappointing poor aggregate scores. Progress has been made in ranking of half of the topics indicators since 2005, but this is overshadowed by a drop in measures relating to access and quality of credit information, resulting in a mere +1 movement. Whilst Nigeria compares more favourably with other countries in the Sub-Saharan Africa region as 12 out of 45 in overall ranking, it still needs to perform better in the same individual topics. These indicators demonstrate the nature and extent of negative investor perceptions and hurdles to investment in Nigeria

**Table 2.3: Doing Business in Nigeria 2007 - Results**

Ease of...	2006 rank	2005 rank	Change in rank
<i>Doing Business</i>	108	109	+1
Starting a Business	118	115	-3
Dealing with Licences	129	134	+5
Employing Workers	56	56	0
Registering Property	170	171	+1
Getting Credit	83	76	-7
Protecting Investors	46	43	-3
Paying Taxes	105	99	-6
Trading Across Borders	137	141	+4
Enforcing Contracts	66	105	+39
Closing a Business	72	72	0

Source: World Bank (2007)

### **2.2.3 Emergence of Nigeria's Economic Crisis**

In the colonial times to the 1960s Nigeria economy depended to a large extent on the agriculture sector. This dependence was both for domestic food supply and raw materials for the agro-allied industries as well as for foreign exchange earnings. The main exports of the country were groundnuts, palm produce, timber, logs, cotton, hides and skins. The importance of agriculture was also reflected in the sector's share of the GDP. For instance, statistics indicated that between 1962 and 1970, agriculture (broadly defined, including life stock, forestry and fishing) accounted for between 48% and 70% of the gross domestic product (GDP). During the same period Nigeria became a major world producer of cassiterite and columbite. Substantial volumes of coal were mined to meet domestic needs and the country also extracted gold, tantalite, lead and zinc in small quantities. Industrial minerals were investigated in many states, but these were never developed for a variety of reasons. Several attempts have been made since independence to develop mineral deposits, in particularly iron ore and industrial minerals to meet local demand. In the 1970's the Nigerian Mining Corporation (NMC) was established with specific responsibility for exploration and exploitation of all mineral resources except energy minerals. While NMC was able to explore a few deposits, the ascendancy of petroleum as the major foreign exchange earner, led to the neglect of the solid minerals sector and its eventual collapse.

By 1975, the petroleum sector accounted for 23.3% of the GDP. This is against 1.7% in 1962. With time, the Nigerian economy had come to depend rather precariously on the oil sector. This impetus was provided by the world oil price shock (increases) of 1973 consequent upon the Yom Kippur war in the Middle East. The oil price rose from \$2.40 in 1972 to \$3.65 in 1973/4. The dependence by Nigeria on hydrocarbon production was both as the major source of foreign exchange earnings for the government and the rest of the economy. Foreign exchange (petrodollars) earned in the process was routinely magnetized

by the government. All manner of projects were embarked upon against economic rationality. The steady rise in the price of crude oil in the world market ensured that huge budget deficits were conveniently accommodated.

In official circles, since money was no longer the problem, but rather, how to spend it, massive programmes of frivolous foreign debts were accumulated. Loans, whose true values have not yet been ascertained, were obtained from capital markets (London club), as well as from official sources (the Paris Clubs of Creditors).

At the inception of the Shagari's administration in 1979, the price increases continued such that by 1980, the world crude oil market bought a barrel for \$40.00. This honeymoon did not continue for too long. By late 1981, the market began to weaken in response to the use of other sources of energy as well as a recession in the industrialized economies. Thus the price of crude oil fell to between \$36.00 and \$34.00 per barrel in 1982. As noted by Ogbonna (1984), in the same period, the impact of the shock in the world oil market began to take its toll on the economy. The country's foreign reserves declined precipitously from \$10 billion in 1980 to \$1.6 billion in March 1982, against an import bill of \$1.2 billion per month. This fell short of the standard requirement that a country's reserves should be able to meet three months import bills to be adjudged adequate (CBN, 1986.) Although the official explanation then was that the problems were simply cash flow in nature. However, with the benefit of hindsight, we now know better.

This state of affairs forced the government of the day to conceive of the policies to address the problem as the economy was grinding to a halt. These problems manifest in the form of instability in oil prices, terms of trade shift and changes in export volume, amongst others.

Although the civilian administration started a discussion with the IMF for credit accommodation, it was stalemated due to their inability to reach an agreement on the policy measure precedent to the stand-by arrangement.

As a consequence, Nigeria's inability to service its trade credits, forced the creditors to cut the credit lines. Many of the import-dependent industries were forced to close down, or operate at less than one-third of their installed capacities. Austerity policies of 1983 through 1985 did not yield the desired results as the prices of oil in the world market declined to an all time low in the period. A Structural Adjustment Programme (SAP) was introduced by the Babangida administration's as a solution to the economic problems.

The SAP policies, in place by June, 1988, had the following objectives which are to enable Nigeria to:

- restructure and diversify the productive base of the economy in order to reduce dependence on the oil sector and on imports;

- achieve fiscal and balance of payments viability over the period;
- lay the basis for a sustainable non-inflationary or minimal inflationary growth; and
- lessen the dominance of unproductive investments in the public sector, improve the sector's efficiency and intensify the growth potential of the private sector.

Initial findings pointed to some increase in the mining and non-oil exports in the five years following the introduction of the SAP. However, this was attributed to the depreciation of the naira in the FOREX market which boosted the earning of the exporters.

The implementation of the SAP ushered in the commercialization of public corporations as the government has moved to sell off the loss making public corporations in the face of dwindling public revenues. The programme has been pursued under 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> phases. A large number of public enterprises have been sold and many more are to go, including the Nigerian Mining Corporation.

The policy of divestment of government also led to the retrenchment of some workers who have yet to find other jobs. Furthermore government expenditure is being streamlined towards less employment while more impetus is being given to the private sector.

Increasingly, the policy stance of the government since the SAP was introduced has been to liberalize the environment. This has impacted on a number of activities such as the establishment of many commercial/merchant banks, the introduction of universal banking and banking consolidation. This has introduced innovation in the industry, albeit there have also been some problems such as distress, high turnover of staff and an increase in unethical practices. The deregulation of the foreign exchange market has had far-reaching impact on the FOREX market, price levels and interest rates for example. Furthermore foreign trade has been liberalized and the hitherto debilitating controls have been removed.

#### **2.2.4 Policy Changes Since 1999**

What can be termed the economic policy framework of the administration which was inaugurated on May 29, 1999 can be gleaned from documents published shortly after its inauguration and the National Economic Empowerment and Development Strategy (NEEDS, 2004) respectively. Although not a detailed document, "Obasanjo's Economic Direction, 1999-2003, nevertheless points out the economic path the administration charted for itself during that period. The overall objectives are the pursuit of a "strong, virile and broad-based economy, with adequate capacity to absorb externally generated shocks. In addition, the policies are geared towards a buoyant economy with a high level of productivity (FRN, 2000:8). In order to achieve this, the administration envisaged a combination of policies that will result in rapid and sustained growth of not less than 6-10% per annum by 2003.

The policy changes are couched under the theme of “economic re-direction” and cover all the sectors of the economy and are largely comprehensive. Specifically the measures include actions already taken such as:

- Presenting (obtaining) an anti-corruption Act;
- Reviewing and suspending contracts whose award lacked merit;
- Curtailing excessive and extra-budgetary spending by government;
- Adopting measures to achieving fiscal prudence, transparency, minimal deficits and efficient resource use;
- Mounting domestic and international campaigns to recover looted public assets;
- Introducing universal basic education (UBE) scheme to wipe out illiteracy and ignorance;
- Addressing energy crises;
- Reviewing developments in the various critical sectors of the economy and outlining measures to move the nation forward;
- Presenting and obtaining an Act setting up the Niger Delta Development Commission (NDDC);
- Establishing the poverty alleviation programme (PAP) and National Poverty Eradication Programme (NAPEP), etc;
- The award of a new national minimum living wage; and
- Assisting the private sector to increase capacity utilization in manufacturing enterprises.

The overall economic strategy of the new economic direction is anchored on private sector-led growth. In this context, the broad strategy is articulated to embrace the following elements:

- Privatization: Government is to divest its holdings in enterprises where the private sector can perform better;
- Continued Deregulation: The economy will be deregulated so that there is no sector reserved exclusively for the government to operate alone;
- Bureaucratic bottlenecks will be reduced;
- Economic decision making will be democratized to enable individual economic units to interact to take decisions;
- Interaction of actors in the private sector shall be encouraged, to provide the driving force for economic growth and development; and
- Government is to be a catalyst that provides the enabling environment for private sector to thrive. Such enabling environment includes;
  - legal and regulatory frameworks to ensure the efficient operation of markets.
  - Security to guarantee the safety of life and property.
  - Ensuring the independence, integrity and sanctity of contracts.

- Provision of infrastructure to facilitate the operations of the private sector.
- Institutional re-establishment and re-orientation of the bureaucracy to make it friendly, welcoming facilitator of investment and business, and
- Frontier shifting activities by government as initial steps to opening new grounds for the private sector to operate, (FRN, 2000:9-10)

Nigeria's macroeconomic performance over the last few years has been commendable. Recent economic reform efforts are showing positive results including:

- In 2005, growth continued to be strong at 7% for the economy as a whole and 8% for the non-oil sector. In the first quarter of 2006, the Nigerian economy grew by 8.3% with real growth of 5.6% predicted for 2006-2007;
- In January 2006, the country received its first credit rating (BB-) from Fitch and Standard and Poor's;
- Year-on-year inflation fell from 28% in August to 12% by December 2005 and 8.5% in June 2006;
- A positive current account balance of US\$9.6 billion was posted in 2005.
- In 2005 Nigeria imported about US\$26 billion of goods. In 2004 the leading sources of imports were China (9.4 %), the United States (8.4%), the United Kingdom (7.8%), the Netherlands (5.9%), France (5.4%), Germany (4.8%), and Italy (4%). Principal imports were manufactured goods, machinery and transport equipment, chemicals, and food and live animals;
- In the same year the country exported about US\$52 billion of goods. In 2004 the leading destinations for exports were the United States (47.4%), Brazil (10.7%), and Spain (7.1%). In 2004 oil accounted for 95% of merchandise exports and cocoa and rubber accounted for almost 60% of the remainder;
- Nigeria posted a US\$26 billion trade surplus, corresponding to almost 20% of GDP
- A Fiscal Responsibility Bill has passed critical second readings in both the Senate and House;
- The National Assembly is discussing a Public Procurement Reform Bill.
- A bank consolidation program was implemented strengthening the financial sector and enhancing its ability to provide credit to the private sector; and
- The import tariff regime has been liberalized reducing the number of tariff bands from 19 to 5 and lowering the average tariff from about 29% to 12%.

The IMF has recently completed its first review under the Policy Support Instrument (PSI), which, after discussion by the IMF's Board, will allow Nigeria to complete implementation of its debt deal with the Paris Club Creditors. The US\$750 million fiscal space created by the debt deal has been allocated for the achievement of Millennium Development Goals and poverty reduction. The World Bank and DFID will be helping the government to set up a Monitoring and Evaluation System to monitor these funds and civil society groups will be actively involved.

	Real GDP				Consumer Prices <sup>1</sup>				Current Account Balance <sup>2</sup>			
	2004	2005	2006	2007	2004	2005	2006	2007	2004	2005	2006	2007
<b>Africa</b>	<b>5.5</b>	<b>5.4</b>	<b>5.4</b>	<b>5.9</b>	<b>8.0</b>	<b>8.5</b>	<b>9.9</b>	<b>10.6</b>	<b>-0.1</b>	<b>2.3</b>	<b>3.6</b>	<b>4.2</b>
<b>Maghreb</b>	<b>5.1</b>	<b>4.0</b>	<b>5.8</b>	<b>4.7</b>	<b>2.9</b>	<b>1.5</b>	<b>4.1</b>	<b>3.8</b>	<b>7.1</b>	<b>12.2</b>	<b>14.5</b>	<b>11.1</b>
Algeria	5.2	5.3	4.9	5.0	3.6	1.6	5.0	5.5	13.1	21.3	24.8	19.1
Morocco	4.2	1.7	7.3	3.3	1.5	1.0	2.5	2.0	1.9	1.8	0.5	-0.1
Tunisia	6.0	4.2	5.8	6.0	3.6	2.0	3.9	2.0	-2.0	-1.3	-1.6	-1.4
<b>Sub-Sahara</b>	<b>5.6</b>	<b>5.8</b>	<b>5.2</b>	<b>6.3</b>	<b>9.6</b>	<b>10.7</b>	<b>11.7</b>	<b>12.6</b>	<b>-2.3</b>	<b>-0.6</b>	<b>0.4</b>	<b>2.3</b>
<b>Horn of Africa<sup>3</sup></b>	<b>8.1</b>	<b>8.2</b>	<b>9.4</b>	<b>9.0</b>	<b>8.4</b>	<b>7.8</b>	<b>9.0</b>	<b>7.7</b>	<b>-5.8</b>	<b>-10.0</b>	<b>-7.0</b>	<b>-4.0</b>
Ethiopia	12.3	8.7	5.4	5.5	8.6	6.8	12.3	12.2	-5.1	-9.1	-10.1	-7.1
Sudan	5.2	7.9	12.1	11.3	8.4	8.5	7.0	5.0	-6.3	-10.6	-5.9	-2.8
<b>Great Lakes<sup>3</sup></b>	<b>5.6</b>	<b>6.0</b>	<b>5.7</b>	<b>6.2</b>	<b>6.9</b>	<b>11.6</b>	<b>9.1</b>	<b>5.7</b>	<b>-3.3</b>	<b>-3.4</b>	<b>-5.6</b>	<b>-6.4</b>
Congo, Dem. Rep. of	6.6	6.5	6.5	7.2	4.0	21.4	10.0	8.9	-5.7	-4.9	-4.2	-0.2
Kenya	4.6	5.7	5.4	5.2	11.6	10.3	13.0	1.6	-2.7	-2.2	-3.8	-5.8
Tanzania	6.7	6.8	5.9	7.3	4.1	4.4	7.5	6.5	-3.9	-5.2	-8.3	-9.8
Uganda	5.7	6.0	5.5	6.0	5.0	8.0	6.7	7.0	-1.0	-1.6	-5.0	-7.1
<b>Southern Africa<sup>3</sup></b>	<b>5.0</b>	<b>6.5</b>	<b>6.1</b>	<b>11.4</b>	<b>46.5</b>	<b>33.9</b>	<b>53.3</b>	<b>68.2</b>	<b>-0.6</b>	<b>3.8</b>	<b>4.8</b>	<b>6.9</b>
Angola	11.2	20.6	14.3	31.4	43.6	23.0	12.9	8.3	3.5	12.8	12.2	17.4
Zimbabwe	-3.8	-6.5	-5.1	-4.7	350.0	237.8	1,216.0	4,278.8	-8.3	-11.1	0.5	-0.5
<b>West and Central Africa<sup>3</sup></b>	<b>6.5</b>	<b>5.6</b>	<b>4.6</b>	<b>5.7</b>	<b>8.0</b>	<b>11.6</b>	<b>7.1</b>	<b>5.6</b>	<b>-0.5</b>	<b>4.1</b>	<b>7.4</b>	<b>10.1</b>
Ghana	5.8	5.8	6.0	6.0	12.6	15.1	8.8	7.1	-2.7	-7.7	-7.6	-7.9
Nigeria	6.0	6.9	5.2	6.4	15.0	17.9	9.4	8.0	4.6	12.4	15.7	18.9
<b>CFA franc zone<sup>3</sup></b>	<b>7.6</b>	<b>4.7</b>	<b>3.2</b>	<b>4.7</b>	<b>0.2</b>	<b>4.3</b>	<b>3.1</b>	<b>2.7</b>	<b>-3.6</b>	<b>-1.7</b>	<b>0.4</b>	<b>2.1</b>
Cameroon	3.7	2.6	4.2	4.3	0.3	2.0	2.9	3.0	-3.4	-1.5	—	0.3
Côte d'Ivoire	1.8	1.9	1.9	3.0	1.5	3.9	2.6	2.8	1.6	-0.1	1.8	3.1
<b>South Africa</b>	<b>4.5</b>	<b>4.9</b>	<b>4.2</b>	<b>4.0</b>	<b>1.4</b>	<b>3.4</b>	<b>4.6</b>	<b>5.7</b>	<b>-3.4</b>	<b>-4.2</b>	<b>-5.5</b>	<b>-4.7</b>
<i>Memorandum</i>												
Oil importers	4.8	4.5	4.8	4.5	7.3	8.3	11.1	12.5	-2.8	-3.3	-4.1	-3.8
Oil exporters <sup>4</sup>	7.3	7.4	6.7	9.1	9.7	9.0	7.2	6.2	5.8	12.2	15.4	15.8

<sup>1</sup>In accordance with standard practice in the *World Economic Outlook*, movements in consumer prices are indicated as annual averages rather than as December/December changes, as is the practice in some countries.

<sup>2</sup>Percent of GDP.

<sup>3</sup>The country composition of this regional group is set out in Table F in the Statistical Appendix.

<sup>4</sup>Includes Chad and Mauritania in this table.

Source: IMF World Economic Outlook

### Figure 2.1: Selected African Countries: Real GDP, Consumer Prices and Current Account Balance

After years of economic mismanagement and deep corruption, there is now a dynamic reform team comprising the Economic Management Team, which is supporting the President in driving forward an ambitious reform agenda. The government has launched its poverty reduction strategy NEEDS, and alongside this, it has restored macroeconomic stability, and effectively managed oil revenues. DFID and the World Bank are supporting the NEEDS programme through a joint Country Partnership Strategy.

The NEEDS focuses on four key strategies:

- Reforming government institutions and to restructure and strengthen government;
- Growing the private sector by reducing the influence of government in the economy and accelerating the privatisation, deregulation and liberalisation programme;
- Beginning to implement a social charter to improve people's access to health, education, welfare, employment, security and participation; and

- Value re-orientation including anti-corruption, freedom of information and enhancing the role of civil society.

The administration has also taken decisive action against corruption. Nigeria is leading the world on its implementation of the Extractive Industries Transparency Initiative (EITI). The aim of the initiative is to increase transparency over payments and revenues by companies associated with mineral extraction to host country governments and government-linked entities. Nigeria's commitment to transparency has been underlined in the G8 compact, as noted in Eyre and Macfarlane (2003), and through the creation of an EITI unit in the Presidency. President Olusegun Obasanjo committed to EITI in November 2003 and launched Nigeria EITI (NEITI) in February 2004. The National Stakeholders Working Group (NSWG) steers implementation and it is comprised of 28 individuals from civil society, media and government, as well as national and multinational companies. In 2006, the NSWG announced the results of independent financial, physical and process audits for the period 1999-2004. These audits examined, according to EITI criteria, financial and physical data from private and state-owned companies, national and international companies, and regulatory authorities. This process was designed to improve accountability and transparency in the extractive sector.

Nigeria has also established a dynamic Economic and Financial Crimes Commission (in 2003) to fight corruption. At State level, the challenges are greater, but here too there has been progress. Most States have implemented State Economic Empowerment and Development Strategies (SEEDS). Their performance in economic governance - the policy, institutional, and legal environment within which an economy functions, and transparency, is being measured. Reforms are being introduced to improve the accountability of local government. Donors and the Federal government are helping States to reform. However, capacity constraints and a weak statistical system for policy formation still need to be addressed if NEEDS is to meet its objectives.

### **2.2.5 Infrastructure – Taken from Library of Congress Country Studies Series Nigeria**

Decaying infrastructure is one of the deficiencies that NEEDS seeks to address. The government has begun to repair the country's poorly maintained road network. Because Nigeria's railroads are in a parlous condition, the government is trying to rectify the situation by privatizing the Nigerian Railroad Corporation. Similarly, the government is pursuing a strategy of partial port privatisation by granting concessions to private port operators so that they can improve the quality of port facilities and operations. Nigeria's airports and civil aviation system have a poor reputation for efficiency and safety, and government-owned Nigerian Airways is struggling. In the telecommunications sector, mobile telephones are more widely disseminated than landline phones, and Internet use revolves mainly around cybercafés.

- **Roads:** Nigeria has roughly 113,000km of surfaced roads, but they are poorly maintained and are even cited as a cause for the country's high rate of traffic fatalities. However, in 2004 Nigeria's Federal Roads Maintenance Agency (FERMA) began to patch the 32,000km federal roads network, and in 2005 FERMA initiated a more substantial rehabilitation. The rainy season and poor equipment pose challenges to road maintenance.
- **Railroads:** As of 2003, Nigeria's poorly maintained rail system had 3,557km of track, 3,505km of which were narrow gauge and the remainder, standard gauge. The country has two major rail lines: one connects Lagos on the Bight of Benin and Nguru in the northern state of Yobe; the other connects Port Harcourt in the Niger Delta and Maiduguri in the north-eastern state of Borno. As of March 2006, Nigeria and Niger expected to move forward with plans to establish a rail link between the two countries. Nigeria is also seeking a rail link with Cameroon, but discussions are more contentious in the aftermath of the International Court of Justice's October 2002 verdict in favour of Cameroon on the issue of control of the Bakasi Peninsula. In order to remedy the poor condition, efficiency, and profitability of the nation's railroads, the government is seeking to privatize the Nigerian Railroad Corporation. Under the privatization plan, three separate concessions of 25–30 years would be granted to private-sector companies to run railroads in the western, central, and eastern regions.
- **Ports:** The Nigerian Port Authority (NPA) is responsible for managing Nigeria's ports, which have fallen behind international standards in terms of the quality of facilities and operational efficiency. Recognizing that the government lacks the funding and expertise to modernize facilities and run the ports efficiently, the NPA is pursuing partial port privatisation by means of granting concessions to private operators. Nigeria's principal container port is the port of Lagos, which handles about 5.75Mt of cargo each year. The port, which consists of separate facilities at Apapa and Tin Can Island, has a rail connection to points inland. Port Harcourt, a trans-shipment port located 66km from the Gulf of Guinea along the Bonny River in the Niger Delta, handles about 815,000t of cargo each year and also has a railroad connection. Both ports are not only responsible for Nigeria's seaborne trade but also serve inland countries such as Niger and Chad. A new port is under construction at Onne about 25km south of Port Harcourt. Relatively modern and efficient terminals managed by multinational oil companies handle most oil and gas exports.
- **Inland Waterways:** Nigeria has 8,600km of inland waterways. The most important are the Niger River and its tributary, the Benue River.
- **Civil Aviation and Airports:** Nigeria's principal airports are Murtala Muhammad Airport in Lagos and Mallam Aminu International in the northern state of Kano. Three other international airports are located in Abuja, Kaduna, and Port Harcourt. Overall, Nigeria's airports, whether international or regional, suffer from a poor reputation for operational efficiency and safety. Private domestic air carriers have

won business at the expense of Nigerian Airways, which is government-owned and suffers from financial and management problems.

- **Pipelines:** In 2004 Nigeria had 105km of pipelines for condensates, 1,896km for natural gas, 3,638km for oil, and 3,626km for refined products. Various pipeline projects are planned to expand the domestic distribution of natural gas and to export natural gas to Benin, Ghana, Togo, and, potentially, even to Algeria (where a Mediterranean export terminal is located). Energy pipelines are subject to sabotage by militant groups or siphoning by thieves.
- **Telecommunications:** Television and radio broadcast stations currently operational in Nigeria are as follows: 83 AM, 36 FM, and 11 short-wave radio stations and three television stations. Recent information on the number of radios and televisions is not available. In 2005 Nigeria had only about 1.8 million Internet users, many of whom relied on equipment at cybercafés. Internet hosts totalled 1,535. In 2004 more than 9.1 million mobile cellular telephones and 1 million mainline telephones were in use.

### **3.0 THE SOLID MINERALS SECTOR IN THE NIGERIAN ECONOMY**

#### **3.1 Introduction**

This chapter analyses the place of the solid minerals sector within the Nigerian economy. Accordingly, the chapter contains an overview of the solid minerals sector in the Nigeria economy; the place of solid minerals in economic theory; solid minerals in Nigeria, sub-Saharan Africa and emerging minerals producing countries. The chapter ends with an analysis of policy issues and economic reforms.

#### **3.2 Solid Mineral Exploitation and its Contribution to Economic Development**

The exploitation of minerals generally and solid minerals in particular is attributable to two interrelated reasons, namely, to enable the country to source raw materials for domestic industries and as exports for foreign exchange. This stance is easy to appreciate against the backdrop that an economy that cannot meet the local industrial needs for raw materials invariably has to import these items from abroad and bear the consequences of foreign exchange loss; export of jobs and a slow pace of industrial development and job creation. Indeed, the issue when examined carefully is also linked to the search for a solution to a mono-cultural economy that is dependent almost entirely on the export of crude oil for government revenue and foreign exchange earnings.

However, it would seem that even the solid minerals sector has not been empowered to play a commendable role in the scheme of things. Among other factors until 1995 the sector was part and parcel of the Ministry of Mines and Power. In this respect, the mining component seemed to have been the junior partner, and therefore received a commensurate level of attention. Meanwhile, government's thought was concentrated on the petroleum sector, which was a form of 'cash cow'. This was in spite of the overwhelming evidence that in other African countries solid (hard) minerals were playing a similar role as oil - as main earner of foreign exchange and government revenue. These countries include Botswana, Democratic Republic of Congo, Zambia, Guinea (Conakry), Sierra-Leone, and Mauritania. In these countries, solid minerals play a crucial role in their economies; by contributing significantly to their exports.

In a similar manner, a former Secretary-General of the UN, Kurt Waldheim noted some decades back, that one of the routes to raising government revenue and foreign exchange is the discovery of some minerals. Specifically, he observed *inter-alia* that "most of the countries so far identified as 'least developed' are resource poor countries or to be more accurate, countries without known exploitable resources". Further in corroboration of the Secretary-General's position, Hollis Chenery also pointed out that as countries become more industrialized, possession of exploitable mineral resources become less important. But for

poor, less developed countries, possession or lack of such resources may be extremely significant in determining the pace of their growth (Chenery, 1964:49).

### **3.2.1 Solid Minerals in Economic Theory**

From the issues sketched in the preceding sections, it is evident that the government, beginning from the colonial period had been interested in the sector, albeit the efforts had been rather less focused as it has been in other solid mineral producing countries, in sub-Saharan Africa. However, the interest in the sector and efforts to develop it stem from the conventional wisdom concerning the role of natural resources in economic development, in that mining development should bring extensive economic benefits, particularly where a country lacks alternative sources of development and are otherwise unattractive to foreign investors. Providing appropriate legal and policy frameworks are in place, together with an adequate level of political stability and well defined property rights, foreign investors are likely to be drawn to rich mineral deposits. Over the past 15 years enabling frameworks for developing countries have been established, primarily with the assistance of the World Bank. This has resulted in a substantial inward investment flow and created opportunities and challenges. Opportunities include foreign exchange earnings in hard currency, increased government revenue, jobs, improved education and skills and the development of infrastructure. While many countries have benefited immensely from mineral extraction, some have failed to realise the opportunities afforded. A key challenge for many countries is the development of policy frameworks to ensure capture of mineral wealth and the creation of long-lasting benefit to local communities. A further challenge is for countries to maximise the value-added from raw mineral production.

It is thought, by some, that resource endowment is most critical in the early low-income stages of the development process and it is argued that, as development proceeds, and a population acquires more skills, the same are developed with increasing effectiveness to counter any resource difficulty (Ginsburg, 1957; Auty, 1993).

Deriving from the above argument, Maddison (1991) has pointed out that although the resource advantage of Australia and North America influenced their total GDP rate of growth by attracting a large inflow of migrants, its influence on per capita GDP levels have been declining over the long term. Interestingly though, he notes that Australia has a lower per capita income than Japan despite the fact that its per capita resources-based on land and minerals are 150 times those of Japan, and it also secured a head-start in economic development.

This thesis posits that an increase in revenue derivable by the exploitation of solid minerals increases the stock of resources available to the country and consequently enhances the country's capacity to execute more development programmes. The initial stock of resources is shown by the production possibility curve (frontier) PF, with the country able to produce

some goods and services. At the pre-mining sector contribution, there is a low level equilibrium. *Ceteris paribus*, increased earnings of foreign exchange from the solid minerals exports, by augmenting the country's stock of resources also raise its capacity to produce. The appreciation of the real exchange rate, thanks to additional foreign exchange. Were this to be the final state of affairs, there would be no problem. This is because this analysis has assumed away the impact of the injection of additional revenue on the traded and non-traded goods (T and NT) sectors, and the allusion to the Dutch Disease.

It has been argued by some economists that a favourable natural resource base may be less beneficial to countries at low and mid-income levels of development than the conventional wisdom might suppose. This stems from the developing countries' performance in the post-war era in the area of industrialization and performance of the mineral-rich developing countries since the 1960s. Indeed, Auty (1993) notes succinctly that "evidence suggests that not only may resource-rich countries fail to benefit from a favourable endowment, they may actually perform worse than less well-endowed countries. This counter-intuitive outcome is the basis of the resource curse thesis". Nevertheless, much of this is theoretical speculation and the empirical evidence is not conclusive. Correlation between low levels of economic development and mineral wealth should not lead to automatic assumptions of causality

Similarly, some researchers have provided evidence using industrialization that mineral economies' economic growth and social welfare are inferior to those of non-mineral economies at a similar level of development. However, this counter-intuitive finding is paradoxical since compared to the countries deficient in minerals; the mineral resource provides the nations with additional foreign exchange, taxes and extra route to industrialization. That additional route is via resource-base industrialization, which is the down stream processing of the ore into metals and finished products. The resource curse thesis has manifested in the hydrocarbon sector of these economies e.g. oil-producing nations, where petro-dollars over three decades have not translated to a meaningful level of industrialization. This is partly attributable to the highly entrenched powerful vested interests that are benefiting from rents (returns in excess of normal profits) which were created by inefficient policies.

### 3.2.1.1 *Peculiarities of the Solid Mineral Sector*

In order to gain further insight to the prospects of the solid minerals sector, an examination of the peculiarities of the sector is imperative as noted by Auty (1985, 1993); Gelb et. al. (1988), Bosson and Varon (1977). These peculiarities to the existence of a unique mining production function are with respect to the ratio of capital to labour; domestic linkages and deployment of mineral rent. Consequently, it is observed that unlike most developing countries' primary products exports, mineral production is strongly capital intensive and employs a very small fraction of the total national work force with large inputs of capital from foreign sources. As a result, some mineral producers display marked *enclave tendencies* but others may be well

integrated with the rest of the economy, usually with strong links with Multinational Corporations (MNCs). The implications are that where the mineral operator works in an enclave the sector yields modest local production linkages. That is, few local factories are established to supply inputs to further process the ore prior to export. What is more, the sector displays low revenue retention since a large fraction of export earnings flow immediately abroad to service the foreign capital investment. Thus, in the above circumstances, unlike say the agricultural sector, fiscal linkage (i.e. taxes) tends to dominate the mining sector's contribution to the national economy. Ironically, it is the existence of the rents on mineral taxes accruing to the government that destabilise the economy. Governments that have expanded their mineral production rapidly have also had to cope with the effects on other parts of the economy. In some cases, the imprudent domestic absorption of mining sector rent where it has occurred (e.g. Zambia, Jamaica, and Bolivia) have rendered much of the agricultural and manufacturing activities internationally uncompetitive, thus finding themselves suffering some of the worst symptoms of the *Dutch Disease*, described earlier. The deduction here is that unless properly managed, the exploitation of minerals can be harmful to economic performance as the damage caused in times of export booms are not easy to reverse during recessions (Krugman, 1987).

It is important to make a realistic assessment of the prospects for mineral exploitation, if minerals have long-term prospects a government may choose to make long-term adjustments to the economy on the understanding that workers will have to move away from their traditional export industries. Mineral revenues can be used to ease the transition from mineral extraction to temporarily support or retrain displaced workers.

### 3.2.1.2 *Linkages of Mining with the Economy*

The impact of mining of solid minerals on domestic economies has been examined from different perspectives. There is for instance the *structuralist thesis* which attributes the underperformance of such economies to the role of the MNCs. Proponents like Girran (1970; 1971), Evans (1975) submit that with reference to Jamaica, less than 3% of the total value-added created by the bauxite-aluminium production chain accrued to the country. This was attributed to a combination of the aluminium, MNC's' vertically integrated production strategy and oligopolistic market structure dominated by six large corporations. It is further argued that the MNCs, set prices so that they would reduce their tax liabilities through transfer pricing. Evans' (1975) findings in the study on Brazil are similar to Girran's.

Another explanation of the linkages of mining to the domestic economy is the "*stable thesis*". This derives from the proposition that the impact of mineral rent on the host economies is mixed. According to this thesis, rent from successive mining activities has played a role in the growth of such developed advanced countries as the USA, Canada, Australia, etc. Governments have a number of ways of distributing benefits locally. Specifically, Reynolds (1979) notes that profit from copper funded development in 17th century Sweden, and

similarly gold in Australia and South Africa. Proponents of this thesis further point out that Britain's property is partly attributed to the rents earned by the exploitation of minerals from the colonies. The gist of the stable thesis is that host economies need to enunciate policies that will enable them to harness the mining rents for the development of their economies. A key method is a more deliberate sharing of fiscal revenues among different levels of government and other stakeholders. It is noted that in Peru, the mining law provides for a fixed percentage of the mineral revenues collected by central government is to be paid to regional authorities. However, due to 'fiscal difficulties' the central government have delayed the transfer of funds. Very few countries have established provisions for the distribution of funds beyond the national level.

This *stable thesis* argument can be stretched further by reference to the extant rise of the requirement of good governance. Generally there is the need for government, especially civilian democratic ones, to realize that one of the tenets of good governance is the management of the country's resources with the sole objective of improving the welfare of the citizenry (Oshionebo, 2003). The review above, makes the issue of good governance accompanied by transparency a strong policy stance and an unwavering commitment to implementing these policies a *sine qua non*. This is because, rather than the above evidence serving as a deterrent to the exploitation of solid minerals it would rather be seen as the provision of a platform that with good policies, countries can benefit from mineral revenues.

The aspect relating to management is given fillip by Auty (1985) when he observed that the mining sector in Less Developed Countries (LDCs) have become capable of supplying a large share of foreign exchange and taxes, though employing only a small fraction of the labour force. There is a high dependence on mining rent which should be avoided because it makes them vulnerable to price volatility arising from the short/medium term rigidity of the international market. A way out for countries desirous of enjoying the revenues is to develop strategies to smoothen out the injections of revenues into the economy so as to root out the swings that impact a negative synergy to the rest of the economy.

A relevant aspect is an examination of the literature with a view to finding out whether indeed the 'resource curse thesis' propounded by Gelb et. al. (1988), Bosson and Varon (1977) holds. The Synopsis of the thesis is that countries could end up not benefiting from the rich endowment of natural resources such as solid minerals. In a more recent assessment of the economic effects of mining, Eggert (2001) considers that it is too easy and simple to take the extreme position- either that minerals are a curse to be avoided, or--that minerals are a blessing that hold a key to economic development in mineral-rich regions. The authors agree that the reality is more complicated. Minerals in the ground hold potential wealth and in that respect they can contribute considerably to the economic development of communities and nations. The extraction of minerals can create significant economic benefits, but these benefits often come at a cost. At the local level, mining affects the natural environment and structure of society. At the national level, mining requires that governments and other entities

learn how to: live with market instability, deal with structural changes in the economy due an expanding or booming resource sector, and minimize rent-seeking and other political problems caused by the presence of mineral rents.

Whether the benefits of mining outweigh the costs is specific to a community or nation. How mining and mineral wealth are managed--by governments, mining companies, and civil society--is critical to whether the potential embodied in minerals in the ground is realized.

Eggert also considers that it is possible to manage mineral wealth so that the economic benefits are enhanced in the short term and sustained over the long term. However he suggests that there are four challenges to be addressed before this can be achieved.

1. 'Creation Challenge'--that mineral wealth be created in the first place, efficiently and in a manner consistent with maintaining standards of environmental quality, social and cultural values. Governments play the pivotal, facilitating role in meeting this challenge, through providing an appropriate legal and political framework in which mining can develop. Three issues are important in addressing this challenge:
  - o governments influence perceptions of geologic potential upon which mining companies base investment decisions, in this respect the availability and accessibility of basic geologic information is critical;
  - o tax and fiscal systems influence where mineral investment occurs;
  - o social and environmental issues need to be incorporated into decision making about whether a mineral deposit is developed.
2. 'Distribution Challenge' such that mineral wealth, once created, should be distributed fairly or equitably among private mining companies, government at all levels, and other organizations and entities. There is no single, accepted method of "correct" allocation of these rents. An important part of this challenge, therefore, is defining what is 'fair'.
3. 'Macroeconomic and Political Challenge' in order to comprehend and manage the broader economic and political effects of the mining cycle. The primary responsibility for meeting this challenge lies with governments, much of which is simply sound macroeconomic management. Meeting this challenge involves :
  - o responding at times of declining and unstable mineral prices: There is little government can or should do to influence prices, therefore the biggest challenge is how to respond to significant annual fluctuations in export earnings and government revenues. Evidence suggests that a sensible course of action involves: using conservative forecasts of mineral revenues, striving for stable growth in government spending in the face of unstable mineral prices, and separating mineral revenues from other revenues and releasing them for spending at a steady rate (Daniel, 1992).

- responding to internal changes in the structure of a national economy as the mineral sector expands i.e. governments should accept the structural change as part of the cost of benefiting from increased mineral revenues.
  - responding to the political problems often associated with mineral dependence, such as rent-seeking behavior and corruption:
4. 'Investment Challenge' to ensure that the economic benefits of mining are sustainable, despite the inevitable depletion of the resource, by saving a portion of the revenues from mining and investing them in other forms of capital. This challenge is one of making the mineral wealth permanent. The critical issues here involve deciding:
- how much to save and invest?
  - in what should the mineral rents be invested?
  - Where the mineral rents should be invested?

Thus, Eggert argues, through appropriate responses to the challenges of mining and economic development, the benefits of mining can be sustained, even when a mine or a mining community inevitably declines as the ore runs out. Mineral wealth lives on, but in other forms. To be sure, mining and minerals can be a curse if the challenges are not met. But if we choose not to address the challenges and instead leave minerals in the ground, we forego the opportunity to take advantage of this gift of nature.

Governments and international bodies are therefore continuing to adopt legal and institutional changes with the aim of providing a framework to encourage mineral investment while providing a focus on the principles and boundaries for this process.

From the foregoing, it is evident that Nigeria stands to derive some advantages from a developed solid minerals sector. Perhaps a reference to the work of the vision 2010 Committee is enlightening in this instance. It had observed that "owing to the underdevelopment of the solid minerals sector, the country's manufacturing sector depends heavily on imported solid mineral raw materials". Furthermore, it has been estimated that the import of iron ore and salt alone accounted for an annual import bill of about ₦ 300 million in recent years. At an import bill of US\$ 3.19million in 1996, it was projected to rise to about US\$3.98 (₦517.4 million) in 2000

The impact of a developed solid minerals sector on job creation has not been carefully articulated. Suffice it to say that, if developed, the output will not only create jobs directly in terms of people engaged in the sector, but also in terms of the multiplier and linkage effects of the activities. These linkage effects have been analyzed in the case of some solid minerals producing countries such as Bolivia, Jamaica, Peru, and Chile. While these are expectations on the potentials of this sector in the country's economic development, it is logical and necessary to pose a number of germane questions, such as: what have been the historical

antecedents of the sector in terms of policy framework, the environment and strategies to develop the sector?

### 3.3 Historical Review of the Solid Minerals Sector

An excursion into the country's economic history reveals that organized and commercial mining activities started in Nigeria long before the amalgamation of the two protectorates, which formed what is now Nigeria. Precisely, the commercial arm of the British colonial overlords: the Royal Niger Company (NRC) first engaged in mining in 1905, in consonance with the then colonial empire building philosophy of "trade following the flag". However, in order to provide legal backing to these activities, the secretary of State for the colonies had established the Minerals Survey Departments of Southern and Northern Protectorates in 1903 and 1904, respectively. It is from this date that the 'timeline' in Figure 3.1 has been extended. The other types of activities worthy of note include the appointment of the first Inspector of Mines in 1908, and the creation of a single body for the entire country, namely the Geological Survey of Nigeria and the Mines Inspectorate Services in 1919 after the amalgamation of the two protectorates in 1914.

Between 1919 and 1946, nothing much happened, in terms of legislations. Rather, mining activities were conducted under ad-hoc guidelines, which were in 1946, codified into the first major legislation in the sector. This was the "Mineral Ordinance" of 1946. Furthermore, in the decade before independence, when coal mining had assumed some importance, the colonial government added the Coal Ordinance of 1950. These two pieces of legislations constituted a kind of watershed as the activities of the solid minerals sector were now orderly and had to be conducted under the rubric of the legislations. In this connection, the Vision 2010 Committee notes that "these laws vested ownership of all minerals in the British Crown and encouraged the development of solid minerals for exports only".

It is necessary to note that between the 1950's and independence in 1960, nothing much occurred. Suffice it to note that other related legislations were the Explosives Act 1964, the Tin Act No.25 of 1967; and the Quarries Act 1969. These addressed one aspect of the sector or the other as mining remained largely in the hands of foreign-owned companies. In addition, the government's attitude to the activities was that the private sector was better placed to handle the activities. A major loophole in the official attitude, perhaps because of the bias of the colonial masters, provisions for the restoration of ecology of the mining sites were largely absent. As a result, the areas that accommodated the main mining activities - Tin, Columbite and Coal - remained littered with mining pits which on the Jos Plateau for instance, have adversely affected the availability of land for other uses.

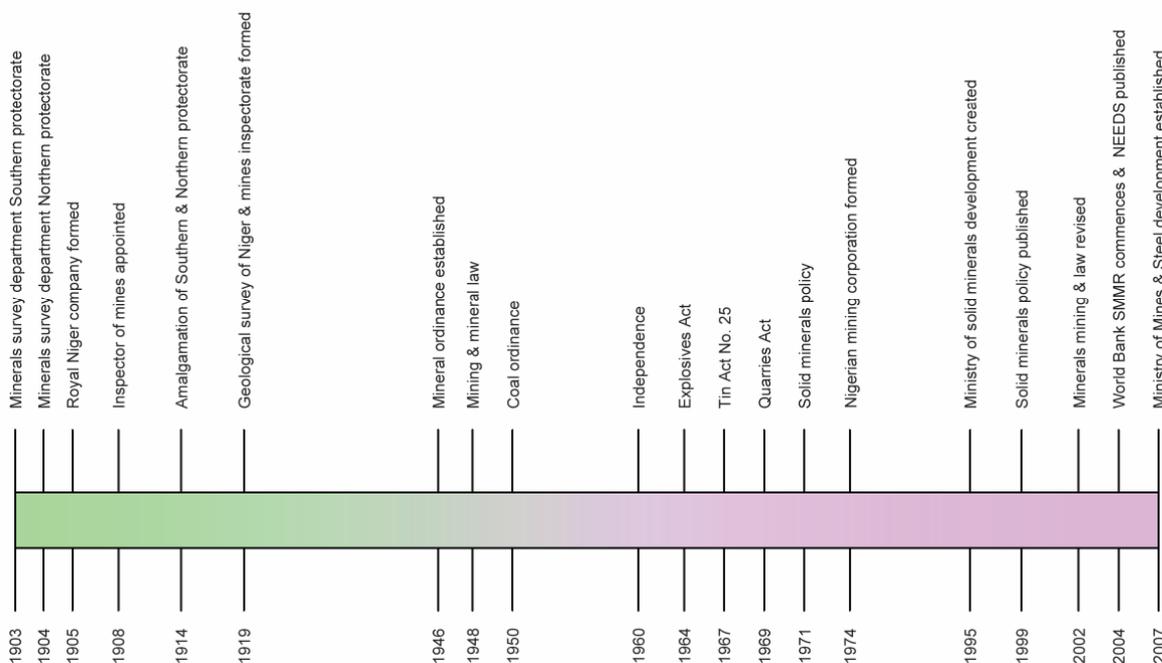
Furthermore, as part of government's initial posture of encouraging the private sector on the one hand; and continuing the policy inherited from the colonial overlords on the other, solid minerals mining remained essentially in private hands. It was not until the second

development plan period (1970-74) that the government made concerted efforts to establish the Nigerian Mining Corporation (NMC) charged with the duty of direct participation in the solid minerals sector (FRN, 1975).

The direct intervention by the government was engendered by a combination of the exit of foreign companies engaged in mining as a result of the civil war, and the socialist posture of a strong interventionist government. Thus, there was the 1971 solid minerals policy, which divided the country into seven mineral zones for the purpose of "exploration for specific minerals". The specific aims of the policy were *inter alia*:

- an intensive geological survey of the country's mineral wealth;
- proper exploitation of the known economically viable minerals;
- expansion of the Geological Survey and Mines offices, and
- relating the development of the country's mineral exploitation to the national economy (Vision 2010, 1998:223).

While the implementation of these policies gave a boost to the solid minerals sector, it nevertheless gradually entrenched the government in the sector. Consequently in this era of right-sizing the government, efforts are now geared to correcting the mistakes that were made in the 1970s.



**Figure 3.1: Timeline of 'Key' Developments in Solid Minerals**

At an equal rate or pace with the above scenario is the fact that from independence in 1960 until 1995, the solid minerals sector was not considered important enough to be carved out as a full ministry with the attention it deserves. Rather it was lumped together with the petroleum sector and thus it is easy to appreciate why it would have been relegated to the background in the scheme of things. An implication of the lumping together of this sector with petroleum was that it was difficult to decompose the contribution of the solid minerals from the former. For instance the contributions of Mining and Quarrying to the country's GDP between 1970 and 1975 are detailed in Table 3.1 below.

Year	1970	1971	1972	1973	1974	1975
Mining & Quarrying (Nm)	3,127.9	4,392.7	5,202.9	5,927.6	6,552.3	7,452.1
%	33.1	39.2	43.3	45.1	45.5	47.7

Source: FRN; Plan Documents, Various Years

While the contributions of the mining sector to GDP appear impressive, that of the solid minerals would in actuality be marginal. Indeed, even in the 1980s, the contribution of solid minerals did not rise above 1.27% in 1981 and 1982 respectively. For other years, 1983 to 2001, its share of the GDP averaged a mere 0.39% over about two decades (Table 3.2).

Year	GDP at 1984 Cost (Nm) 1	Mining & Quarrying (N million) 2	Growth Rate of (2) 3	(2) as % of (1) 4
1981	70,395.9	882.5	-	1.25
1982	70,157.0	893.4	1.24	1.27
1983	66,389.5	681.6	-23.71	1.03
1984	63,006.4	585.8	-14.06	0.93
1985	68,916.3	364.1	-37.85	0.53
1986	71,075.9	194.4	-46.61	0.27
1987	70,741.4	215.7	10.96	0.30
1988	77,752.5	237.4	10.06	0.31
1989	83,495.2	254.6	7.25	0.30
1990	90,342.1	265.4	4.24	0.30
1991	94,614.1	274.7	3.50	0.29
1992	97,431.1	283.1	3.06	0.29
1993	100,015.1	296.6	4.77	0.30
1994	101,040.1	305.5	3.00	0.31
1995	103,502.9	313.5	2.62	0.31
1996	107,020.0	320.0	2.07	0.30
1997	110,400.0	340.0	6.25	0.31
1998	113,000.0	350.0	2.94	0.31
1999	116,400.0	380.0	8.57	0.33
2000	120,640.0	390.0	2.63	0.32
2001	125,350.0	440.0	12.82	0.35
2002	131,489.8	493.2	12.10	0.38
2003	136,470.0	540.0	9.49	0.40
2004	145,380.0	620.0	14.81	0.43

Sources: CBN Statistical Bulletin, Various Issues.

The rather abysmal role of the sector is further buttressed when comparison is made with other African countries in the mid 1980s. This re-emphasizes the point earlier made in this connection. This fact partly stems from the realization that up to the moment, Nigeria cannot be classified as a solid minerals producer as the commodities do not contribute up to 20% or higher of the country's exports (Gelb et al 1988, Auty, 1993).

It was during the Abacha administration that, in 1995, the Ministry of Solid Minerals Development (MSMD) was established. This was long over-due as aptly recognized by Kwa (1999). Thus, it is only from that era that the peculiar problems of the sector began to receive the full and undivided attention of a cabinet minister. At creation the Ministry was charged with the following objectives (functions):

- The acquisition and dissemination of detailed and reliable data on the geology of the country and on the quantity and quality of the country's solid mineral resources;
- The orderly development of the mineral resources to ensure real economic growth; improvement in the standard of living of the people; creation of favourable investment atmosphere; and boosting of development and ensuring maximization of revenue (foreign and local) to the government;
- Adequate supply of mineral resources from internal sources and where necessary, from external sources to maintain the security, national well-being and industrial development of the nation;
- Promotion and diversification of the country's primary mineral products;
- Conservation of mineral resources through research into different extractive methods and the under application and use of minerals;
- Provision of control, infrastructural support and all the wherewithal necessary to promote and sustain investment in mining and mineral processing;
- The establishment and/or promotion of appropriate institutions and strategies that will lead to improvement in manpower, technology; processing facilities and extension services; and
- Provision of necessary investment environment that will motivate and attract the private sector to invest in the solid minerals sector.

(MSMD, 1997:1)

### **3.4 Stock of Solid Minerals in the Country**

Currently, there is documentary evidence that not less than seventy five solid minerals have been identified by the Nigerian Geological Survey Association and found to be of industrial and commercial relevance. These can be classified according to their nature and uses. In Table 3.3, we present these solid minerals in nine sub-groups.

<b>Table 3.3: Mineral Groupings in Nigeria</b>		
	<b>Mineral Grouping</b>	<b>Proven National Endowment</b>
a.	Mineral Fuels	Coal, Lignite, Uranium, Thorium, Bitumen
b.	Metallic Minerals (i) Iron (ii) Non-Ferrous Metals (iii) Minor metals and related non-metals (iv) Precious Metals	Iron, Niobium, Titanium Lead, Zinc, Tin, Columbite Zirconium, Tantalite Beryl, Ilmenite Gold, Silver
c.	Gemstones	Emerald, Tourmaline, Aquamarine, Ruby, Topaz, Sapphire, Amethyst, Diamond.
d.	Structural & Building Materials	Limestone, Gypsum, Clay, Sand, Gravel
e.	Ceramic Minerals	Kaolin, Feldspar
f.	Chemical Minerals	Salt, Sodium-Carbonate, Marcasite, Sodium sulphate
g.	Industrial & Manufacturing Materials	Asbestos, Mica, Talc, Barytes, Diatomite
h.	Metallurgical & Refractory Minerals	Sillimanite, Kainite, Foundry sand, Graphite, Fluorspar, Cryolite
i.	Abrasives	Garnet, Quartz, Corundum, Sands Diatomite

Source: Vision 2010 (1999) p.219.

Apart from the large quantity of minerals as shown in Table 3.3, almost all the states of the federation are endowed with one solid mineral or the other, thereby implying that the industry has high potentials to succeed in the country. This however, will require complementary infrastructure and policy framework. Table 3.4 shows that only Bayelsa State is not credited with any solid mineral, on the current basis of geological survey. This lends credence to the fact that it may not be a misplaced priority after all to pursue the development of the sector vigorously, given the wide-spread availability of the solid minerals.

**Table 3.4: Distribution of Solid Minerals in Nigeria by States**

STATES	MINERAL RESOURCES	STATES	MINERAL RESOURCES	STATES	MINERAL RESOURCES
Abia	Brine, Iron-ore, Lignite, kaolin, clay	Gombe	Gypsum, Columbite, lead, zinc, tantalum, tin ore, clay	Niger	Glass, Silicon stone, gold, iron-ore and limestone
Abuja	Marble, kaolin, clay, tin, tantalite, lead, zinc	Imo	Limestone, lead/zinc ore, clay	Ogun	Limestone, chalk, phosphate, clay, kaolin, tar-sand
Adamawa	Barytes, salt (evaporites) trona calcium laterites, Ilmenite (titanium iron-oxide) minerals, marble, gypsum, clay minerals.	Jigawa	Kaolin, tourmaline marl and marlstone, potash, silica, iron-ore, copper, gold, white quartz and refractory clay	Ondo	Bitumen (tar-sand), quartz, limestone, kaolin, iron-ore, columbite, clay
Akwa-Ibom	Clay, glass, sand bentonite	Kaduna	Gold, Gemstone, talc, mawganite, kyanite, Sillimanite, rutile, beryl, iron-ore, quartz, clay, zinc, tin, tantalite, columbite, precious stone	Osun	Gold, clay, limestone, granite, talc
Anambra	Kaolin, Limestone, marble, etc.	Kano	Tin, zinc, lead, columbite clay, copper, silica, tantalite, niobium, tungsten, kaolin, quartz, etc.	Oyo	Dolomite, Sillimanite, kaolin and granite, marble, iron-ore, clay, gemstone
Bauchi	Limestone, columbite, Iron-ore, tin, kaolin, tantalite, wolfram	Katsina	Graphite, marble, kaolin, silica, asbestos, gold, gin, clay, niobium, feldspar, rose quartz, iron-ore.	Rivers	Silica, sand, granite, clay
Bayelsa		Kebbi	Kaolin, salt, clay, limestone, gypsum, iron-ore, manganese, gold.	Sokoto	Gold, kaolin, gypsum, salt, marble, lignite, feldspar and limestone, phosphate etc.
Benue	Wolfram, tin, columbite, tantalite, kaolin, gypsum	Kogi	Limestone, clay, gold, iron-ore, gemstone, coal, marble, feldspar, kaolin, cassiterite, columbite, tantalite, ornamental stones, quartz, talc, mica.	Taraba	Baryte, bauxite, iron-ore,
Borno	Diatomite, gypsum, Iron-ore, Feldspar, Mangretite, potash, trona, limestone, clay.	Kwara	Iron-ore, marble, limestone, feldspar, clay, dolomite, potash, clay.	Yobe	Potash, gypsum, limestone, trona, glass sand, diatomite, espomite, clay shale, marble, granite, rock and kaolin
Cross River	Limestone, baryte, uranium, bentonite	Lagos	Silica, bitumen, laterite, glass sand, clay	Zamfara	Gold, mica
Delta	Lignite, gypsum, tar sand, silica	Nasarawa	Iron-ore, marble (Toto), coal, baryte, lead zinc, brine, tin, tantalite, columbite, wolfram beryl		
Ebonyi	Salt, limestone, lead zinc, brine, gypsum				
Edo	Gypsum, tar sand, lignite, marble, silica sand,				
Ekiti	Tantalite, Quartz, Kaolin, sand, clay, gold, feldspar, granite, mica.				
Enugu	Coal, lime clay, limestone, silica, iron-ore, lead/zinc, kaolin and baryte				

Source: NIPC, and: Investing in the Nigerian Economy, (Abuja: NIPC) Pp 40-42.

### 3.4.1 Output of Solid Minerals in Nigeria

The production of solid minerals has been from two major sources, namely the government owned corporations, (the Nigerian Mining Corporation (NMC) Jos, the National Coal Corporation (NCC), Enugu, the National Iron Ore Mining Company Itakpe, and the Nigerian Uranium and Mining Company) and private small-medium scale exploiters who have been mainly unorganised and often not incorporated as businesses. CBN (2000) found that of the operators in the sector, 29.9% are micro enterprises, 55.2% medium scale while only the remaining 14.9% can be considered as fairly large. Similarly, in terms of business types, 40.3% were classified as sole proprietorships; 47.0% Cooperatives; 6.0% partnerships, and

the 'others', 6.7%. With the move towards, restructuring of the government over the 1980s/1990s the sector experienced some slow down as allocation to the sector declined.

Although the list of solid minerals in the country is large (vide Table 3.3 and Table 3.4), the ones whose production records exist in official statistics are only five, namely, Cassiterite (Tin Ore), Coal, Columbite, Limestone and Marble (Table 3.5). Of the five that are shown, Coal and Limestone are the most important due to their relevance in the domestic economy. Coal used to be a source of power for the locomotives in the 1960s and 1970s and the Oji River thermal power station. Exports have been ineffective due to logistics and the quality of the Nigerian Coal. Limestone output is crucial in the cement industry due to the derived demand for building materials. In both cases, the production of Coal has fluctuated; rising through the 1970s, but declined in the late 1970s to 1980s before picking up in 1985-1987. In summary the industry is in dire straits, requiring serious resuscitation. The production of limestone fluctuated between 1972 and 1978, rose slightly in 1979 and 1980, slowed in 1981-86, but rose again in 1992-95. Its fortunes are invariably tied to those of the cement industry.

The estimated production arising from all solid minerals since 2000 is given in Figure 3.2. It should be noted that assembling reliable statistics is a difficult task. There are wide annual fluctuations and discrepancies between estimate from various sources, which indicates under-reporting, particularly in the case of precious metals and gemstones. Traditional production of cassiterite and columbite has declined but is showing a resurgence recently. The production from state-owned companies (coal and iron ore) has dropped to very low levels and well below their capacity.

**Table 3.5: Principal Solid Mineral Production (Tonnes)**

Year	Cassiterite	Coal	Columbite	Limestone	Marble
1970	10,754.0	60,912.0	1,616.0	688,399.0	1,830.0
1971	9,900.0	192,990.0	1,381.0	813,425.0	4,675.0
1972	9,102.0	341,217.0	1,360.0	1,406,036.0	3,555.0
1973	7,827.0	327,131.0	1,244.0	1,733,031.0	-
1974	7,373.0	304,035.0	1,312.0	1,810,870.0	5,936.0
1975	6,288.0	248,791.0	991.0	1,650,264.0	5,680.0
1976	5,009.0	298,765.0	673.0	1,553,427.0	1,433.0
1977	4,400.0	267,075.0	816.0	1,436,968.0	8,087.0
1978	4,080.0	218,860.0	567.0	1,184,191.0	8,726.0
1979	3,824.0	172,144.0	588.0	2,064,067.0	1,031.0
1980	3,570.0	175,977.0	554.0	2,518,205.0	640.0
1981	3,178.0	104,225.0	377.0	1,508,899.0	3,735.0
1982	2,428.0	56,110.0	167.0	1,510,472.0	2,736.0
1983	2,102.0	53,573.0	79.0	1,510,472.0	981.0
1984	1,776.0	76,077.0	81.0	1,541,236.0	1,104.0
1985	1,100.0	139,743.0	100.0	1,891,457.0	2,137.0
1986	193.0	144,411.0	13.0	1,847,376.0	14,820.0
1987	213.0	114,598.0	48.5	2,627,409.0	72,691.0
1988	234.0	82,487.0	51.0	1,712,073.0	5,445.0
1989	350.3	80,882.0	45.8	1,314,843.0	1,377.1
1990	333.6	77,520.0	44.4	1,135,692.0	32,268.1
1991	246.1	137,657.5	35.8	1,435,405.6	29,224.6
1992	107.5	100,073.0	38.2	3,034,767.0	21,191.3
1993	175.0	28,281.5	16.5	3,204,253.0	16,044.0
1994	208.3	25,000.0	17.0	3,239,030.0	17,035.1
1995	203.6	20,000.0	37.0	3,656,598.1	22,460.0
1996	3,584.1	27,116.4	565.6	2,095,219.6	28,608.2
1997	5,965.2	10,829.8	495.7	2,430,719.7	22,249.7
1998	5,162.2	18,473.1	620.5	1,919,952.4	87,841.3
1999	8699.6	27,751.0	1,574.80	3,812,174.3	142,263.0
2000	6775.3	11,537.9	951.7	1,814,664.3	80,241.5
2001	3371.0	11,496.0	952.0	18,047,003.0	836,900.2
2002	1004.0	43,482.0	156.0	11,414,927.0	1,551,329.0
2003	2341.0	23,089.0	383.0	7,408,287.0	840,820.0
2004	2379.0	9,000.0	390.0	7,772,690.0	851,117.0

Source: Central Bank of Nigeria (2000b; 2001), Statistical Bulletin, P.118

**Nigeria: Estimated Production of Mineral Commodities**

All values given in metric tonnes except where indicated

<b>Commodity</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>
<b>Metals</b>					
Coltan concentrate	469	610	156	383	100
Gold (kg)	200	250	65	160	40
Iron Ore (,000 tonnes)	25	25	25	0	0
Lead-zinc ore	165	247	250	250	200
Steel	0	0	0	0	10000
Tin concentrate	3502	3677	1004	2341	1300
<b>Industrial Minerals</b>					
Baryte	5000	5000	5000	5000	6000
Cement (,000 tonnes)	2500	2400	2100	2300	2300
Kaolin	165765	209478	200000	200000	210000
Clays	50412	60474	60000	60000	50000
Feldspar	1449	1811	1800	1800	1700
Gypsum	530262	609800	300000	100000	100000
Granite (,000 tonnes)	2016	2419	2500	2500	2000
Limestone (,000 tonnes)	3326	3392	11415	7408	2100
Marble (,000 tonnes)	117	129	1551	840	150
Shale (,000 tonnes)	142	163	130	130	70
Topaz (kg)	25	1	10	10	10
<b>Energy Minerals</b>					
Coal	11536	11495	43482	23089	9000

Source: USGS 2005

**Figure 3.2: Estimated Production of Mineral Commodities**

### 3.5 Comparative Analysis of Solid Minerals in Nigeria with Sub-Saharan Africa and Other Emerging Producing Countries

Africa produces +60 metal and solid mineral products and is a major producer of several of the world's most important minerals and metals including gold, platinum group elements (PGM), diamonds, uranium, manganese, chromium, nickel, bauxite coltan and cobalt. However, Africa's contribution to the world's major base metal supply (copper, lead and zinc) is less than 7%. Although more exploration is required, Africa is estimated to host around one-third of the world's mineral resources, including 40% of gold, 60% cobalt and 90% of the world's PGM reserves - making it a truly strategic producer of these precious metals (Mbendi, 2007).

The Republic of South Africa, Ghana, Tanzania, Zambia, Zimbabwe, and the Democratic Republic of Congo dominate the African Mining industry, whilst countries such as Angola, Sierra Leone, Namibia and Botswana rely heavily on the mining industry as a major foreign exchange earner.

Evidence exists to the effect that many Sub Saharan Africa (SSA) countries have headed the conventional wisdom that solid minerals have potential to contribute to the development of

local economics. This is because they have developed sectors in their respective economics and have been earning revenues for the sectors. A study by the vision 2010 committees in the 1990s found that the countries enjoyed revenues from exports of solid minerals. Furthermore, the contribution to GDP value added was good. It was a high of 40% of GDP in Botswana and 15% for Gambia. Other details are in Table 3.6. The figures are for 1987.

S/N	Country	Mining Exports as % of Total	Mining Value-Added as % of GDP
1.	Botswana	90	40
2.	Zaire	73	24
3.	Zambia	93	15
4.	Zimbabwe	43	8
5.	Guinea	92	14
6.	Niger	80	2
7.	Liberia	58	3
8.	Ghana	19	2
9.	Gabon	19	2
10.	Mauritania	31	12
11.	Sierra-Leone	74	13
12.	Togo	29	7
13.	Senegal	9	2
14.	Burkina Faso	20	3
15.	Nigeria	0.4	0.3

Source: Vision 2010 (1999) P.218.

An aspect of this state of affairs that merits comment is the state of development attained by similar developing countries in the late 1980's. In Zambia for instance, the country was already earning close to 60% of its foreign exchange from the solid minerals sector; while the picture for other South and Central American countries were 7% (Bolivia), 33% (Chile and Papua, New Guinea) and 21% (Peru). Similarly the figures for export trade were as follows: Bolivia; solid minerals contributed 89.5% of its exports in 1970 and earned for it US\$205 million in that year and US\$ 367 million in 1976. For Peru, mineral exports accounted for 45% of exports or \$465 million and \$684 million in 1970 and 1976, respectively. At the same period, Chile's solid minerals provided 85.6% of its exports in the same period; and in foreign exchange terms, garnered \$954m and \$1417.6m in 1970 and 1976. Curiously, at this time Nigeria's solid minerals were being exploited at best for local consumption by the import substitution industries in cement and allied products. It was not a force to reckon with in foreign exchange earnings. Yet the potential exists to increase production value in Nigeria from its \$3 million per year base to values approaching \$600 million per year.

The importance of mineral production to regional and national economies has been more recently demonstrated in the findings of the regional processes of the Mining Minerals and Sustainable Development Project, 2002. It has been shown that in the Southern African Development Community region, mining output constitutes about 8% of GDP. In South Africa, which is responsible for more than 70% of the region's mining output, the figure is

6.5%. The range within Southern Africa is still considerable, from a high of over 40% of GDP in Botswana to less than 1% in Nigeria. Mining contributed 43% to the continent's exports, with Botswana, Democratic Republic of the Congo, Namibia, and Zambia deriving over 50% of their export earnings from mining. In Latin America the contribution is also important. Bolivia generates 3.6% of its GDP and 32% of the value of its national exports from mining. Chile obtains 10.3% of its GDP and 44% of the value of its national exports from mining, while mining in Peru contributes almost 50% of the exports and 5.5% of the GDP. Australia relies greatly on its mineral commodities for export income with 45% of export income with basic mineral commodities accounting for 9% GDP. The US has the largest minerals sector in the world by volume, although less than 0.5% of its GDP comes from direct mineral extraction.

The recent increases in exploration and expansion of mines throughout the continent have mainly concentrated on gold and diamonds, but improving base metal prices has generated an exceptional level of activity in the search for and development of base metal mines. Mozambique, Nigeria and Madagascar are some of the countries that are perceived to have tremendous potential for base metal deposits, as evidenced in the figures shown above. While some prospective investors are thought to be disparaging of Africa, other enterprising individuals and organisations have recognised the great, unexploited potential of the continent and are actively pursuing business opportunities across the continent.

Africa's opportunities for investment, which range in risk from investing in emerging market funds or the listed multinationals active in Africa to trading with African partners, include:

- oil and gas (Angola and Libya);
- mining (West and Central Africa);
- privatisations (South Africa and Nigeria); and
- infrastructure (pipelines, roads, telecommunications).

### **3.6 The Role of the Financial Sector**

The Nigerian federal government has stated its commitment to ensuring that the financial sector is best-positioned to assist in the attraction of foreign direct investment opportunities, if the latent value of the solid mineral deposits could be tapped. As such, they are implementing economic programmes and reforms focusing primarily on the development of a private sector-led economy, non-oil dependent GDP growth, poverty reduction and job creation.

The banking sector is undergoing consolidation under the supervision of the Central Bank of Nigeria, which has regulatory authority over the entire financial sector. More than 60 marginal banks have been closed, and 25 relatively well capitalized deposit banks have emerged. Even before the consolidation, loan assets and deposit liabilities were highly concentrated. A

number of banks have either gone back to the capital markets to raise additional funds and seeking partnerships or mergers to further strengthen the financial base.

In addition to deposit banks, Nigeria has hundreds of community banks and a small number of specialized development and mortgage banks. The Central Bank has recently launched a national microfinance policy seeking to enhance the provision of diversified microfinance services on a long-term and provide a sustainable basis to people in low-income brackets through the formation and registration of microfinance financial institutions and microfinance banks. The Microfinance Banks will be restricted from engaging in foreign exchange business, but it is hoped that assistance through the scheme will be afforded to Artisanal and Small-scale miners. It should be noted that, contrary to modern practice, many financial transactions in Nigeria are conducted in cash rather than with bank letters of credit, long term loans are rarely provided and interest rates are high where credit is available.

The CBN also amended certain existing foreign exchange regulations by reducing documentation requirements and certain restrictions on some transactions, thus creating flexibility in the use of foreign exchange. These include:

- Use of a Certificate of Capital Importation (CCI) (evidence of inflow of foreign currency by a foreign investor);
- The requirement that the use of foreign trade finance facilities being subject to CBN approval, and that the application of such facilities be limited to the purchase of plant, machinery and raw materials required by the manufacturing sector, no longer applies;
- CBN approval is no longer required for foreign bank guarantees or foreign currency deposits as collateral for naira-denominated loans; and
- Nigerian residents are now allowed to source funds from the foreign exchange market for investments in foreign currency-denominated securities, subject to repatriation of the earnings from such investments in ordinary domiciliary accounts.
- Repayments of foreign currency borrowings from Nigerian banks can now be sourced from the CBN for all projects. Also the requirement of producing a CCI for local foreign currency borrowings has been dispensed with.

## **4.0 INTERNATIONAL PERSPECTIVES ON SOLID MINERALS**

### **4.1 Introduction**

This chapter examines the political economy and the place of solid minerals trade. It discusses the distribution and pattern of global trading together with the likely investment decisions taken. The chapter contains the following sections – the political economy of solid minerals trading, the market place for solid minerals, mineral pricing methods and mining investment for large and small-scale operations.

### **4.2 The Political Economy of Solid Minerals Trade**

The current world distribution of individual minerals is substantially different from the pattern formed by their use. As major producers of manufactured goods most Western European countries and Japan have long been the chief importers. More recently the growth of economies in China and India have created a market for the importation of ferrous and non-metals and industrial minerals necessary to feed their rapidly growing demands to expand their manufacturing base. The level of raw material import dependence of these consumers is between 50 and 95%, for many metals. Although sources of these minerals are widespread across the world and supplies of many of these are coming from investments made in Australia, Canada, Russia and South Africa, this still leaves many developing countries in the position of prime suppliers of solid minerals to the industrially based nations. If future demand levels are to be met, mining exploration and development for solid minerals will need to expand in both traditional and new environments.

As in many industries, the pattern of mining in terms of products and location of mineral development is dynamic e.g. post 1980 has seen the decline in coal mining in Europe, a massive rise in copper production in South America and the emergence of China as a strong player in the supply and consumption of mineral commodities. Each mineral resource has its own model of geographic distribution

Solid minerals can be divided into a number of groups, namely:

- Energy minerals (Coal, Lignite, Atomic minerals)
- Major industrial metals (Base metals, Ferrous metals)
- Specialist metals (Tin, Wolfram, Tantalum)
- Precious metals (Gold, Silver, Platinum)
- Gemstones (precious and semi-precious)
- Industrial minerals
- Construction materials

The world trade relationship between suppliers and consumers has been relatively dynamic and volatile. Cyclical trends in the economy have been and probably always will be the most significant factor affecting the supply and demand for minerals. Major industrial metals are mainly affected by forecasts for economic growth such that in an upturn demand and price of metals tend to rise, and a fall in demand for manufactured goods has a profound effect on the need for basic inputs to the productive process. As a general rule, metal prices are unlikely to be high when economic conditions are poor. Specialist metals are also influenced by the prospects for economic growth, but developments of applications of a particular metal in a fast growing industry may of itself create an increase in demand and price e.g. use of specialist metals in mobile phones. Price changes in the lower value bulk industrial mineral and energy commodities usually result from natural shortages or surpluses. Construction minerals are mined and consumed close to the source of the deposit and tend to follow the growth of a country's economy and build programme, demand tends to fall rapidly in line with a decline in new construction which always accompanies such economic downturns. The precious metals and gemstone sector, by contrast, often perform well in times of economic weakness when there is inflation or strains in the financial system and the consumer demand for jewellery decouples their use from the economic cycle.

Whilst the export of high-value minerals can make a significant contribution to foreign exchange revenues, this may not necessarily be achievable for industrial minerals. These products are an important feedstock for the development of local manufacturing and construction industries. The ability of Governments to source such material from within the borders of its State provides opportunities for import substitution and ensuring that the mining sector contributes effectively to domestic economic growth.

#### **4.3 The Solid Minerals Market Place**

The quantity and type of mineral commodities used varies between countries. Europe, Japan and the US have historically been the largest mineral users. However, this has changed recently as markets mature particularly in Brazil, China and SE Asia. Europe and Asia are now the world's largest consumers of metals and minerals.

Mineral commodities can be classified according to the manner in which they are traded. Essentially these comprise of three broad bands:

- those having a sufficiently high intrinsic value that they are sold in the global market, e.g. gold, gemstones, copper and aluminium;
- those with high value per unit weight that they are globally or regionally marketed e.g. coal, limestone and steel, and;
- those having a very low value per unit weight e.g. construction minerals, which are of necessity marketed locally.

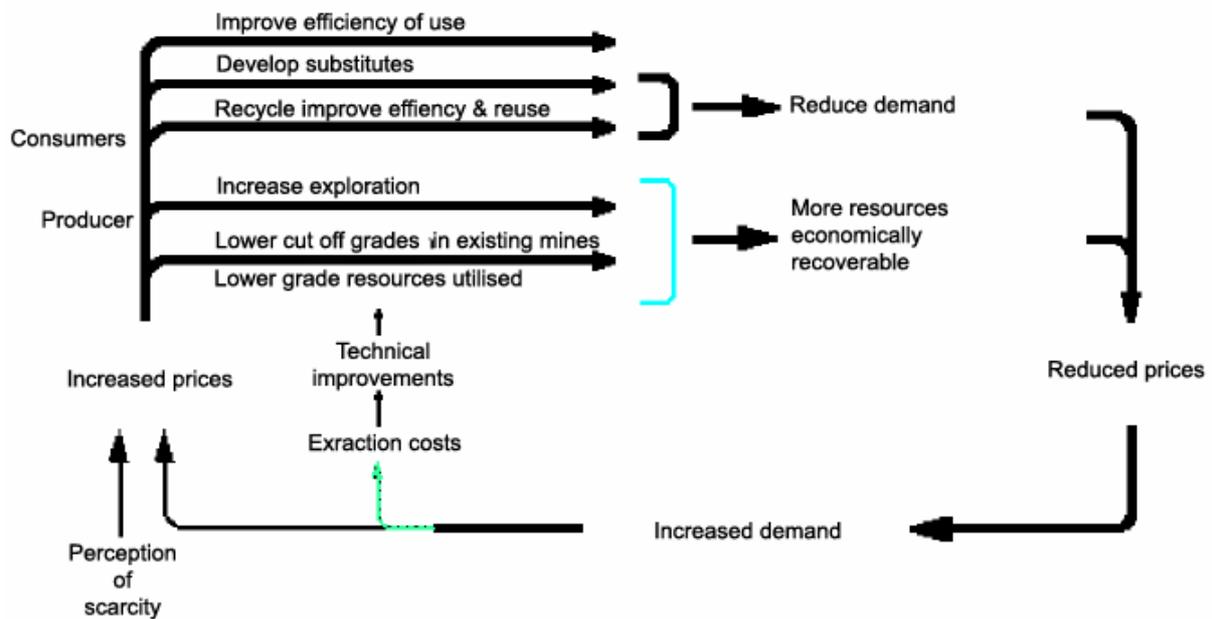
The advent of relatively cheap transport has permitted the globalization of production except for those minerals with a low value relative to transport cost. The gradual migration of mineral production to developing countries has resulted in many of the low-cost deposits in those countries being mined-out. Longer lead times and difficulties in obtaining permits to extract minerals, coupled with higher labour costs are also factors which contribute to the changing pattern of migration of sites for mineral production. This situation is more particular to metals than for industrial minerals and construction minerals. The fact that some minerals are sold globally does not mean that there is not a regional or local market for the product. A large proportion of the global mineral production is domestic output that meets a domestic demand e.g. China is the world's largest steel producer and user, but it still needs to import significant amounts of iron ore (+80 million tonnes in 2001) to maintain its drive for growth.

Essentially, mineral commodities are supplied in amounts that reflect their scarcity and value in use. Common minerals can be produced cheaply, since they can be extracted from large deposits with economies of scale. Rare minerals and gemstones are expensive to produce because they tend to occur in only a few deposits often only as traces. They can also be supplied in various forms. Common metals are normally produced from ore deposits, which have a high metal content. An iron ore deposit containing say, 67% Fe would be worked in preference to one with a lower grade. Precious and rare metals are often measured in grams per tonne.

In volume terms construction minerals constitute the largest amounts mined globally (+15 billion tonnes per annum) and steel is the largest volume of traded metal (763 million tonnes in 2000). This compares with the small quantities of the rarer metals (160 tonnes platinum). The US\$ price paid for minerals varies widely in relation to the commodity. Platinum prices averaged approximately US\$17 million per tonne, whereas coal averaged US\$40 per tonne during the same period in 2000. However the total value of sales of coal exceeded US\$136 billion with platinum sales reaching only US\$2.7 million. The use of iron ore for steel production constitutes the highest value of traded mineral commodity with copper, aluminium, zinc and gold, all in the US\$10 – 100 billion range. It should be noted that there is also a significant trade in semi-manufactured and mineral containing products which are additional to these sums.

Growth in population, improvements in standards of living and the development of new uses for minerals has driven the pace of mineral extraction. An increase in intensity of use of a mineral by a country as shown by comparing the consumption per capita of a mineral against GDP per capita, closely follows the level of economic development. As development proceeds, countries start by focussing on building infrastructure and its population generally consume more durable goods which in turn, leads to rapid increases in the demand for mineral commodities. As a country's economy matures consumption of minerals tends to become less intense. Factors such as government policy, demographic changes, new technology and substitution of materials can influence the pattern of mineral use, which

makes forecasting future demand for minerals a notoriously difficult process. The dynamic equilibrium between supply and demand can be illustrated in Figure 4.1.



**Figure 4.1: Typical supply & demand factors affecting a mineral resource (after World Nuclear Association)**

A comparative study (Scott et al 2003) between the behaviour of construction aggregate producers in mature and emerging market environments show markedly different traits which have parallels in other mineral sectors.

A mature market exhibits the following characteristics:

- Market domination by few large companies
- Regional or countrywide activities
- Co-operation in trade associations
- Formal codes of practice, well regulated
- High volume, low cost operations
- Adoption of defined technical standards – BS, ASTM, ISO
- Demand follows economic performance of country
- Drive to maximise resource value – (blockworks, ready-mix concrete, coating plant, upgrading inferior products & recycling aggregate products)

Whereas a developing or emerging market would tend towards:

- Small-scale production, large number of operations
- Locally based activities
- Competitive pricing

- Permitting is less formal, illegal operations are common
- Low volume, variable cost operations
- Inconsistent supply and variable quality of product
- Demand – domestic, commercial and road repairs
- Major construction projects = importation or new, single source of reliable supply

Before any operation can begin it must have a market for its product. The market must be investigated to ensure that it is large enough to support the proposed operation and that the price paid for the product will make it worthwhile mining. Even if only the simplest of market analysis can be conducted before commencing mining, it will help establish the scale of operation.

The present value of a mineral is governed by supply and demand, which is influenced by world affairs and the availability of a reliable source of mineral at the correct quality. To determine if a particular mineral deposit is sensibly available as a resource will depend on the market price of the mineral concerned. Fundamentally, if it costs more to get it out of the ground than its value warrants, it can hardly be classified as a resource (unless there is a major market distortion e.g. by the introduction of government subsidies). Therefore, the resources available will depend on the market price, which in turn depends on world demand for the particular mineral and the costs of supplying that demand. Minerals are traded commodities and if there are many buyers the price of a mineral goes up on the market; if there are many sellers the price of a mineral goes down. The price of the mineral is therefore an important factor to consider when determining whether a deposit will be economically viable.

#### **4.4 Mineral Pricing**

An understanding of the variability of price of mineral commodities is essential in the evaluation of the mining and minerals industry. This is primarily due to the fact that prices simultaneously reflect and affect both demand and supply. In addition they can be influenced by artificial price setting interventions by the industry and governments. Mineral prices exhibit cyclical and considerable volatility.

Mineral prices are generally determined by one of four methods:

- (i) **Producer Pricing**  
This applies to minerals where the producers set the price. It takes into account costs, potential markets, and levels of competition. This is common for industrial minerals where transport costs are high and in the aluminium, molybdenum and nickel industries.
- (ii) **Independent Pricing**

Prices are determined by sources that are neither buyers nor sellers of the metals. Prices are averages of prices of actual transactions between producers, consumers, and metals traders. Examples include Metals Week, Metal Bulletin, Handy and Harman, London bullion dealers.

(iii) Commodity Exchange Prices

Prices are determined by transactions on an exchange such as the London Metal Exchange (LME) or the New York Mercantile Exchange (NYMEX). The LME is the most important centre for spot and futures trading in the main industrially-used non-ferrous metals. Copper, aluminium, nickel, lead, zinc, tin, and silver may be bought and sold, for delivery either immediately (spot price) or at fixed dates in the future (forward price). LME prices refer to refined metals and are used as the basis price for transactions in these metals (except silver) world-wide. NYMEX specializes in precious metal trading of silver, gold, platinum and palladium, but also trades in aluminium and copper.

(iv) Negotiated Prices

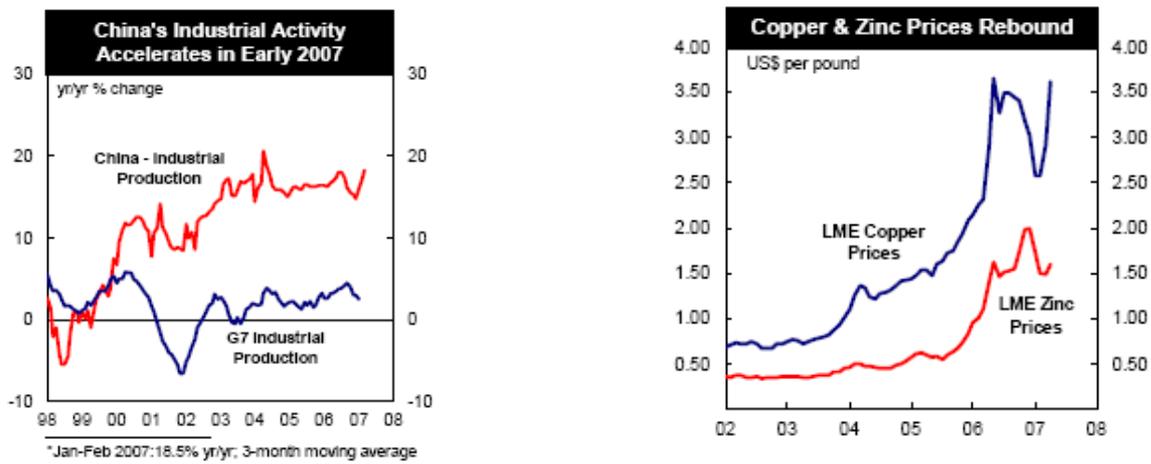
Mineral prices can be set by contract, where miners with a product to sell will deal direct with their customers or act through merchants. This is a common means of setting prices in long-term contracts for ore, metal concentrates or metal products e.g. iron ore to a steel mill and base metal concentrates to a smelter (smelter contract).

The long term trend for mineral commodity pricing depends almost entirely on the product made from it, with prices moving according to technology. Aluminium is influenced by the cost and amount of energy to convert bauxite to alumina and thence to the ingot. Price changes in gold however, have little relationship to production and since supply is difficult to measure because of the secrecy surrounding its storage. Decisions to produce gold are therefore either taken because it is profitable to do so or that it is too costly to stop production

Other metal prices are also very volatile, which has a significant impact on the revenues of mining and mineral processors, host governments and users of mineral products. See Figure 4.2 for illustrations of industrial activity and commodity performance.

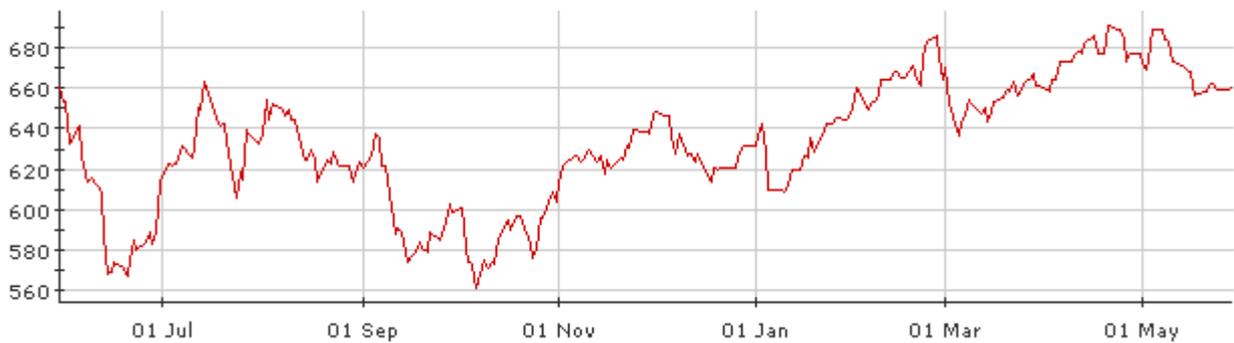
In 2007, the current picture is one where global commodity markets have continued to experience strong demand growth, primarily driven by the emerging economies of China and India. These developing economies are growing at rates much faster than the western world and are a sustaining force behind increased global demand for a wide range of mineral commodities. China in particular has driven the massive spikes in base-metals prices. The second half of 2006 was a volatile period for both metal prices and mining shares. During May, metal prices surged to multi-year highs Copper reached almost US\$4/lb and gold broke above US\$700/oz for the first time in over 25 years. During the remainder of the year, nickel and zinc also soared to new highs with nickel breaking through US\$16/lb and zinc rising above US\$2/lb for the first time. Precious metals also performed well with average prices for

gold, silver and platinum in the second half of 2006 up 33.6%, 60.6% and 26.7% compared to the second half of 2005.

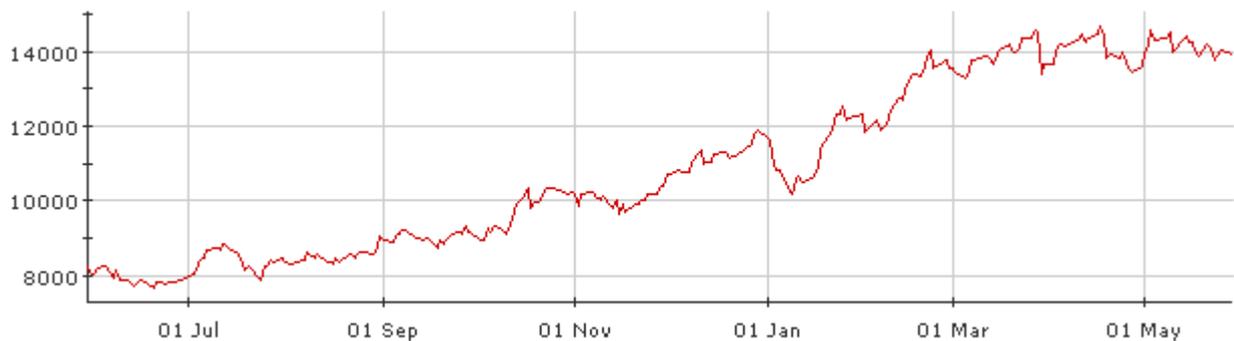


Source Scotiabank 2007

### Forex Gold Index \$/oz



### Tin Cash Unofficial \$/m tonne



Source: BBC 2007

Figure 4.2: Typical Commodity Performance Graphs

John Robinson of Global Mining Investments (GMI) has noted that “the supply side response to increased demand continues to be muted, with companies struggling to respond meaningfully due to a lack of quality projects of international scale, infrastructure bottlenecks and industry wide shortages of skilled personnel, equipment and materials. The current commodity boom is shaping up to be one of the strongest on record and our view is that the sector will continue to flourish supported by strong commodity demand, insufficient supply growth and merger and acquisition activity.” Whether this prediction is realised or not is open to debate, however there is no doubt that the recent commodity price boom is a major driving force in the upsurge of activity in the minerals sector and is one which shows little signs of slowing down in the short to medium term.

By contrast to the sophisticated methods adopted by the large-scale solid mineral producers and traders, most ASM operators sell their product directly to the consumer. However value can be added when the mined raw product is converted to a more marketable product. The price received depends on the current price of that mineral less deductions for processing and handling. The amount of impurities will also reduce the price. However, in some cases the product can pass through several hands, at discount prices, before reaching the formal market price.

#### **4.5 Mining Investment**

There are very few countries in the world that do not have a domestic mining industry, however the number of countries possessing a substantial industry is limited and not all of them are considered an ideal environment for potential investors. There are no large-scale mining operators currently working in Nigeria. Government institutions assisted by the World Bank have undertaken promotional work to advertise Nigeria’s potential for solid mineral wealth in order to attract to foreign investors. In essence the questions which need to be answered before investment can be contemplated may be intuitive but would normally follow the simple steps outlined in Table 4.1 below:

**Table 4.1: Questions to be Answered Before Investment**

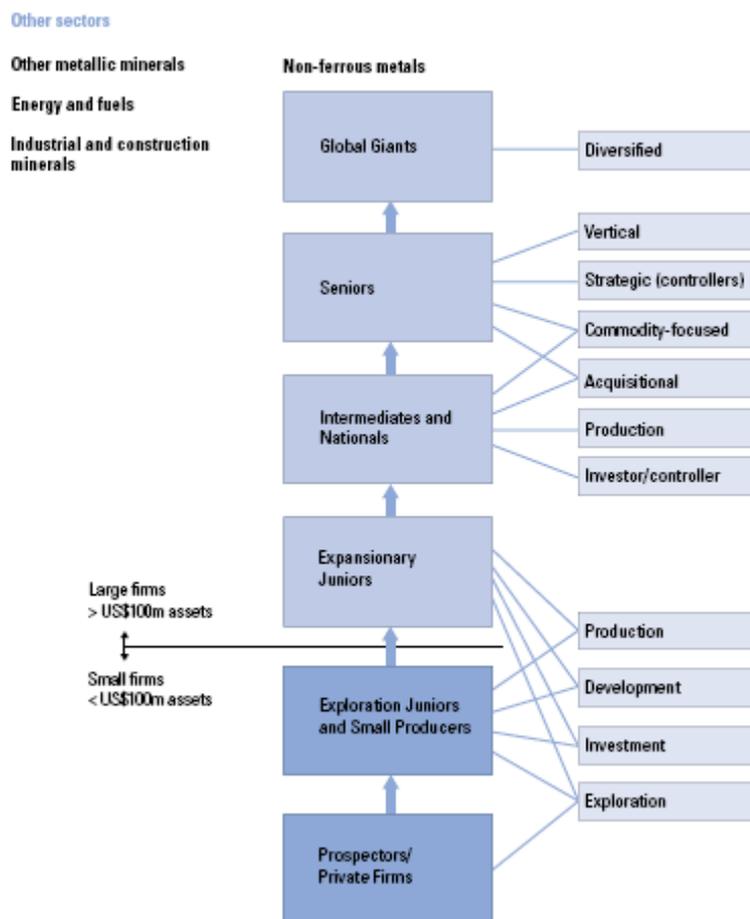
<b>Geological</b>	
What is in the ground?	Establish what useful minerals are in the area.
How did it get there?	Establish the most likely areas of interest within the deposit.
How big is it?	Estimate size and extent of usable resource.
<b>Mining/Processing</b>	
How can the resource be recovered?	Determine the best mining/processing method to be used to achieve the best possible recovery.
What equipment will be needed?	Is any special equipment needed? Where and at what cost can this be obtained?
What services are needed?	Power, water supplies and transport links may be required.
Is there enough working space?	Land will be required for processing equipment, waste disposal and stockpile of the finished product, which does not interfere with working in the un-mined parts of the deposit.
When will working be carried out?	Is the operation intended to be main source of income from a continuous operation or will the work supplement income from another activity? How will time be divided between the various parts of the operation?
Will any help be needed?	Is any extra manpower or technical support going to be needed? Is it available and at what cost?
What regulations need to be followed?	How will health and safety or environmental legislation affect the operation?
<b>Marketing</b>	
Where is the market?	Transport links may be required to bring the product to market. This may involve selling the product to a 'middleman' with marketing and sales expertise. If the market is local, can this be served directly? A plan or strategy will need to be developed.
How big is the market?	Will the market support continuous operation or is it limited, so as to restrict the size of the operation?
What is the competition?	Is there anyone already producing the same product, if so, can it be produced at a competitive price or volume
<b>Finance</b>	
How much will it cost to start?	Is anything going to be bought especially to start the operation, such as equipment or land, including any rights that may be needed?
How much will it cost to keep going?	Labour and training costs, equipment running costs, service charges and sales costs will need to be accounted for.
What are the tax and royalty costs?	What are the rates involved and will the operation attract any special penalties or benefits?
Are there any sources of funding?	Are any special grants or loans available?

Source: Eyre, 2001.

The global mining industry exhibits high volatility of returns over the long term and the increasing size and complexity of investment decisions for large scale mining and mineral processing projects has resulted in complex financing arrangements. For example, a large copper mine, smelter and refinery may involve a capital outlay of US\$1 billion and most metal mining projects will cost over US\$ 2,000,000 to finance. As a result, finance packages can take many years to assemble and will often involve project loans and finance arrangements from a consortium of commercial banks, stock market listed companies, suppliers and buyers, many of whom will be based in different countries. Even then, the grouping may only provide a proportion of the project costs, the remainder being found by a

multinational listed company or joint venture, which would seek to raise the remainder of funds through the stock market, further spreading the risk.

The structure of the minerals industry exhibits the characteristics of an integrated production system, with companies occupying identifiable niches and using various business strategies to reduce risk, create opportunities for growth and upward mobility in the system. (See Figure 4.3). Exploration juniors and small producers specialize in finding new ore bodies and often seek to sell them on to the larger companies. A recent trend in the sector is for intermediates and national companies to realize growth potential through merger among themselves or by being taken over by the largest corporations. Metal miners supply mineral product to smelters and refiners, who in turn provide metals or mineral products to fabricators, and so on. The industry acts within highly interdependent cells, along the supply chain, across different sectors and across different mineral groups.



Source: IIED; adapted from MacDonald (2002)

**Figure 4.3: Global Corporate Mining Sector – Firm Size and Organisational Focus**

The mining industry is global and mining companies will seek to make their investment in the most conducive environment, consistent with level of risk. Conversely, whilst ASM can be undertaken with much less capital and lower technology processes, risk is still a

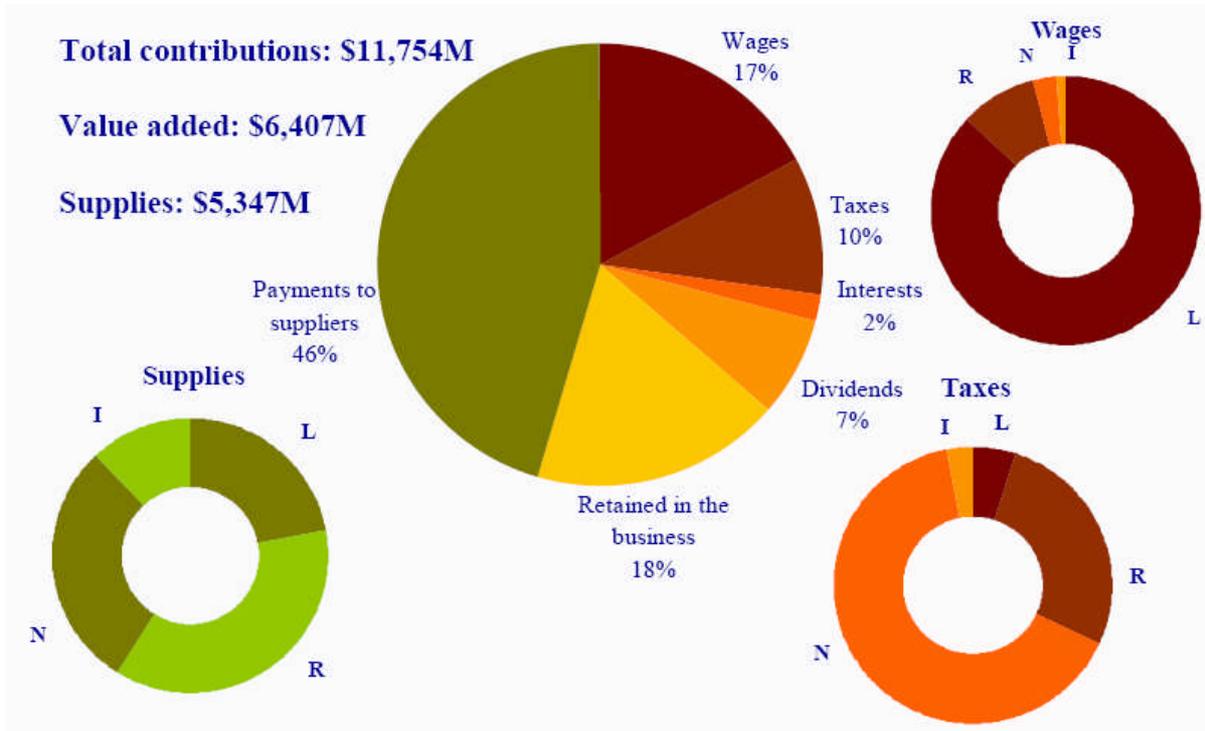
consideration. ASM plays an important role in some minerals, especially in working gold and gemstones. The profile, potential contributions to sustainable livelihoods, and environmental impact of this segment of the minerals sector is quite different from the global corporate players. ASM is described in greater detail later in this report.

The task of any country wishing to attract, stimulate and retain foreign direct (FDI) or domestic investment in its mineral resources is primarily to adopt appropriate Government policies and programmes to:

- implement a policy framework to ensure mineral wealth is captured & creates long lasting benefit for local community and population;
- maximise 'value-added' from minerals extraction;
- ensure stable security conditions
- resolve national v local authority, social tensions;
- provide means of dispute resolution, and
- regularise and aid existing ASM production under Govt. control.

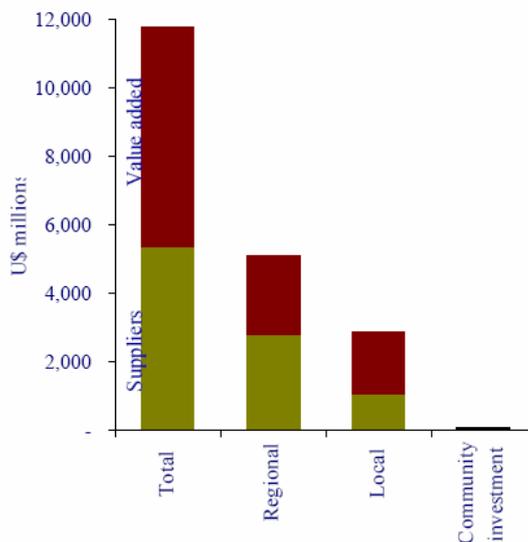
The socio-economic benefits to a country realised through mineral wealth can be considerable. Take for example the effect that ASX listed Oxiana's Sepon gold mine, can have on the economy of a country like Laos. In 2004 its production, from a standing start in 2003, was worth approximately 25 per cent of GDP. The present value of the operation is estimated at US\$100M, from a capital investment of US\$240M. The project adds US\$56M/year to the economy, with a further US\$15M/year raised in taxes, a positive export balance of US\$62M/yr in foreign exchange, a local spend of US\$19M/year and 600 jobs created. Similarly, in Zambia, a copper project with a present value US\$128M, from a capital investment of only US\$68M in 2000-2005, having operating costs of US\$57M/year generates US\$4M/year in taxes and created 8500 jobs.

The economic contribution and distribution made by Rio Tinto in 2003, as a result of its worldwide mining investment is shown in the Figures below.



Source: [www.natural-resources.org/minerals/development/docs/pdfs/Rio\\_Tinto\\_Di\\_Boscio.pdf](http://www.natural-resources.org/minerals/development/docs/pdfs/Rio_Tinto_Di_Boscio.pdf)

**Figure 4.4: Economic Contributions Made by Rio Tinto Plc**



Source: [www.natural-resources.org/minerals/development/docs/pdfs/Rio\\_Tinto\\_Di\\_Boscio.pdf](http://www.natural-resources.org/minerals/development/docs/pdfs/Rio_Tinto_Di_Boscio.pdf)

**Figure 4.5: Illustration of Value Added to Direct Suppliers Element**

Competing mining companies are often willing to deal with anyone who can assure them of a concession or lease. This can, in-turn, lead to corruption, repressive governments and armed conflict. Resource-rich countries like DRC, Angola, and Sudan have been devastated by civil wars funded, and in some cases caused by, some of these commodities, in particular

diamonds. Finding a remedy to this situation could enable the revenues generated to make a significant contribution to alleviating poverty. To achieve this requires transparency and accountability in dealings between government and the mining industry.

#### **4.6 Artisanal and Small-Scale Mining Operations**

It has been estimated by the International Labour Organisation that ASM employs some 13 million people, representing probably more than 30% of the total direct work force of the mining industry, with many miners operating at subsistence level. This type of mining falls into two categories, namely mining and quarrying of industrial minerals/construction materials and the mining of high-value minerals (gold and precious stones). The former is mainly produced for local, domestic markets and exists in every country, whereas the output of precious metal and gemstone operations is generally exported. This model of production currently represents the nature of mining in Nigeria. Wherever there is a small, dispersed, domestic market for industrial minerals, small-scale mines are more likely to account for a high proportion of national production and where there is an opportunity to extract high-value, low volume, near surface minerals artisanal miners will be attracted to such deposits. The typical ASM miner is a producer, of small amounts of mineral, often worked sporadically with high levels of manual labour. Ideal sites for small-scale mining require surface or near surface deposits, very little waste or overburden, uncomplicated processing and easy access. Individuals, families, small groups, joint ventures or co-operatives work many small mines.

In addition to those ASM miners permanently or seasonally employed in those activities, there are significantly more numbers of people that depend on small-scale mining for their livelihood. This generates substantial local purchasing power and demand for materials. On a national scale, if the ASM sector is formalised, the employment could contribute to Government tax revenues through taxation of individuals and sales. The export of high-value minerals from small-scale mines can also make a significant contribution to foreign exchange revenues. Whilst this may not necessarily be achievable for industrial minerals, these products are an important feedstock for the development of local manufacturing and construction industries. The ability of Governments to source such material from within the borders of its State will in addition, provide opportunities for import substitution, as in the case of barite and gypsum, which are mineral commodities on the import ban list for Nigeria. It is therefore necessary for countries to ensure that the ASM sector contributes effectively to domestic economic growth.

In many countries operators do not have the technical or financial capabilities for proper exploitation, mining development, mineral extraction or processing. The factors which are often associated with small-scale mine production, include:

- Poor working conditions;
- Lack of basic mining and financial knowledge;
- Lack of machinery and spare parts;
- Lack of safety; and
- Cash-flow problems.

Despite these drawbacks ASM has several benefits. These include the ability to operate in remote areas with little infrastructure, enabling the exploitation of otherwise unworkable resources and a high degree of flexibility because of the low overheads. Seasonal operations are often popular where mineral extraction can take place flexibly, alongside agricultural production. Furthermore, because they are generally locally owned, ASM operations have the potential to produce more net gains to the community and to the national economy than larger foreign owned mines. Small operations can employ large numbers of workers in remote areas. They can also form the basis for local processing and manufacturing industries or as feeders to larger centralized plants.

It is clear that small-scale mining is and will continue to be an important element in the international mining industry. In Africa, small-scale mining employment and activities became widespread during the last 20 years. Two reasons are given for this increase (UNDP, 1999); during the 1980's, there was a drastic reduction in the demand for raw minerals with consequential falls in mineral prices; resulting in a decline in investment in large-scale mining operations. Many African countries saw ASM as a means of diversifying their mineral production and reducing their dependence on one mineral for export revenues. Another advantage of developing ASM was that it required less rigorous financial and technical conditions and therefore had less substantial initial investment costs. These developments, with their high labour intensity, provided an answer to underemployment. It also reduced the amount of rural to urban migration that would have taken place had that alternative not existed e.g. in 1989, ASM was promoted in Ghana, through the Small-Scale Mining Project; during the five year period, 1989-1994, 30,000 artisanal miners generated US\$ 68.56 million in gold and US\$ 71.5 million in diamonds. As a result, Ghana has been acknowledged as a leader in the promotion of small-scale mining enterprises.

Small-scale mining has the ability to create jobs for local people, foster and encourage business development and draw infrastructure into remote rural communities. It is essential that the revenues and benefits arising from this activity are directed towards aiding the community that are disturbed by it, through the provision of employment, infrastructure, improved health care and education. There are currently estimated to be some 500,000 directly connected with ASM activities and a further 1, 500,000 indirectly dependent upon the continued activities of the sector.

## 5.0 THE ECONOMICS OF SOLID MINERALS

### 5.1 Introduction

This chapter focuses on the economics of solid minerals. This is done against the backdrop of the realization of the distinguishing features of solid minerals. These include

- They are depletable and non-renewal;
- Their exploitation generates spill over costs or externalities;
- Their exploitation is against the realization of sustainability in their usage i.e. the trade-off between current and future generations;
- The sector can be enclave; and
- Their prices are subject to fluctuations in the world Market like all primary products except there is some value-addition to them.

Accordingly, the chapter analyses the issues of efficiency with respect to solid minerals, revenue issues in solid minerals; infrastructural facilities in solid minerals exploitation, and environmental issues and sustainability.

### 5.2 Economic Efficiency of Solid Minerals Operations

The concept of efficiency is an important one in the analysis of Solid Minerals (SM) economics. The issue of interest is the relationship between input and the corresponding output. In the first place, the prospective investor is interested in not only the physical output of solid minerals, but also the prices of the output and the revenue derivable. In this section; we analyze the efficiency of operations with respect to the production function, profitability; the lag in response to enquiries; the stock of minerals reserve. We take these issues in turn:

#### 5.2.1 *The Nature of the Production Function*

This is a measure of the technical relationship between the inputs and the corresponding output. In the case of the SM sector we have a function of the nature:

$$QSM = f ( HK, FK, Tech, RE, PR ) \text{ -----(1)}$$

Equation (1) can be stated explicitly as:

$$QSM = aHK + bFK + cTech + dRE + ePR \text{ ----- (2)}$$

Where:

QSM = Output of solid Minerals in question in metric tones

HK = The Human capital (skills of workers)

Tech = The technology involved in SM production

RE = Regulatory environment

PR = Proven reserves of the mineral

a, b,---e = The coefficients of the variables.

Using the Nigerian environment, we specify the signs of the coefficients a – e as follows:

$$a = \frac{\partial HK < 0}{\partial QSM}; \quad b = \frac{\partial FK < 0}{\partial QSM}; \quad c = \frac{\partial Tech < 0}{\partial QSM}; \quad d = \frac{\partial RE < 0}{\partial QSM}; \quad \text{and} \quad e = \frac{\partial PR < 0}{\partial QSM}$$

At the moment, large scale solid minerals' mining is not being undertaken. Thus, the skills in the area appear weak, hence the negative sign. Similarly, finance capital is not available to SM operations. This therefore implies that financing of the sector will have to be addressed. With regard to the third factor (Tech), the country is a technology user and will need to import the technology both in terms of equipment and machinery. Information on the proven reserves of SM is not readily available. This is the work of the GSN Agency. Information on this variable will positively affect both the investment/funds to be committed by the investors and *ceteris paribus*, the life-span of the mine and the revenue that can be obtained there from.

The regulatory environment (RE) is improving but there is still a lot to be done to make it wholly attractive. There are some legislative instruments till to be passed. This is why it has both positive and negative effect on the output of SM.

### 5.2.2 Indices of Efficiency

Profitability is a cardinal index of business investment. This can be simply defined as the difference between costs and revenue. Profits can be enhanced when all the components of costs are reduced. From a strictly economic perspective, the higher the profits, the greater is the attraction to prospective investors.

### 5.2.3 Time Lag

Another index of economic efficiency is time lag between the enquiry and the response. The shorter the time lag, the greater the efficiency, because it enables the investor to take the appropriate decision and safeguard the value of money involved. Indeed, the establishment of OSIC is geared towards bridging this gap. Poor response rate discourages prospective investors, just as the gestation period in completing the formalities for starting operations in

the country by a SM investor. In addition, the return on investment is crucial to an appraisal of the economic efficiency of SM operations.

### 5.3 Revenue and Related Issues in Solid Mineral Operations

The issues discussed here relate to revenue derivable from SM operations. These are crucial issues which should not be glossed over, as they have implications for both the investors and the government. The section discusses taxes; rents, licence fees and payments for the auctioning of mining blocks as expanded upon below:

- **Tax:** There is no doubt that the investors will have to pay taxes upon their profitable operations. It should be noted that with the Nigerian constitutional provisions, corporate taxes are levied by the federal government as the activity is in the exclusive legislative list. On the other hand for personal income taxes, which are also levied by the federal government, the revenue accrues to the states where the activity is located. The problem has always been on inter-jurisdictional competition where states levy and collect rent and other charges from the companies. This has been a source of friction between the companies and the state governments on the one hand and the federal government on the other. The ease of handling multiple taxation is not alien in Nigeria but this could present a disincentive to investors in solid minerals.
- **Rent:** Mineral Rent is another levy that investors in this sector will have to pay. The issues of importance are the rate of the rent, its competitiveness, and its comparability with other international mineral producers; who in this era of globalisation are competitors. Should the rent be higher than it is elsewhere, Nigeria could lose some investor to its competitors
- **Licence fees:** The government needs to establish sound indicators and criteria for the granting of licences. Factors to consider include the size of the proven reserves, their location with respect to topography and geology as well as accessibility, and the marketability of the mineral. The objective will be to optimize the earnings over time. While these fees are renewable, the ones for auctioned blocks are once for all charges.
- **Auctioned Blocks:** This is another method for granting access to mining sites to investors. Prospective investors are required to bid for blocks of mineral sites in a competitive setting so as to ensure optimal revenue to the government, transparency accountability and good governance. The prospects here are brighter and the approach has become widespread in the oil and gas sectors of the economy. It is expected that the solid minerals sector will borrow a leaf from this practice.

#### 5.4 Infrastructural Facilities and the Solid Minerals Sector

That some of the solid minerals are located in difficult terrain, which is sometimes inaccessible, is a well known fact. In addition, the sector faces other sundry infrastructural problems which are analysed in this section. The type of infrastructure required to improve the sector's viability include the following:

- **Access Roads**, essentially trunk B grade or state roads and local government roads. The absence of roads or their non-motor ability, impede the access to the mineral sites by investors and could become a disincentive to them. Some of the roads are bad and seasonal. Given the nature of many of the minerals, good access roads are in *sine qua non* in the development of the sector.
- **Water supply**: Another infrastructure that would facilitate mining activities is the availability of water. It may be a disadvantage if the investors are forced to provide their own water. This though feasible, would raise the cost of production and make the final product price non-competitive.
- **Power and Energy**: The role of power and energy in the mining process is well recognized. The country is not currently self-sufficient in power supply. To therefore add the demand by this sector to the national position would further aggravate the shortage. In the absence of power, as is currently the position poses a potential threat to the viability of the mining activities. This is a real challenge which needs to be looked into.
- **Telecommunications**: The prospective investor would need this facility to keep in touch with the suppliers, customers, and the government sector and staff for example. The current supply of telecommunications has received a boost by the launching of the GSM in the country in 2001. This has raised the nation's tele-density. The fact however, is that the facilities are mostly deployed in the urban centres due largely to the higher demand in these areas. The rural arrears where the prospective miners would be operating are understandably neglected. A decisive policy will have to be taken to deploy some of the networks to the rural areas. Though the miners can establish their telecomm facilities, this will impact negatively on the operations' cost structure.
- **Health facilities** would also assist the operations of prospective miners as this will serve their staff and the other people who would be engaged in the mining activities. At the moment the health facilities are in short-supply in the countryside. Moreover, some of the mining sites may be remote and far from medical facilities. Already, mining areas are prone to mining hazards such as pollution of water, air, radioactivity, to name a few. Thus, health facilities would go a long way towards mitigating these deleterious effects.

## 5.5 Solid Minerals Sector and Sustainable Environment

This section addresses the issue of efficient natural resources uses. With the benefit of hindsight, it is clear that the exploitation of tin and columbite in the Jos Plateau in the 1940/50s was met with government failure and that of the market resulting in natural resource degradation (NRD). Similarly there was wastage of the environment. These failures are attributed to:

- intervention in markets which sends wrong signals that distort allocation;
- marketing controls;
- land use controls;
- inappropriate fiscal policies (taxes/subsidies); and;
- general failure of bureaucracies to formulate and implement rational national resource policies.

In the 21st century, it is acknowledged that relative prices are important; otherwise there will be a natural desire to exhaust the lowest priced resource first regardless of its true scarcity and environmental benefits. Furthermore, rent-seeking behaviour of government officials can also encourage unsustainable natural resource use. In addition, there is also the inter-generational equity issue in natural resource use. The policy in this area would have to address the following related aspects:

- control the variables that can influence NRD such as the effect of mining on deforestation and on arable farm land;
- understand the policies that can prevent NRD in the mining communities;
- environmental management and control;
- care of natural habitats and bio-diversity;
- settlement of indigenous peoples;
- involuntary resettlement of displaced people ;
- projects in disputed areas; and
- environmental and social impact assessment.

Specifically, the government needs to consider policy actions towards minimizing the consequences of mining activities on the environment. These issues have been well documented elsewhere.

Other policies are:

- market negotiation with the affected communities;
- regulatory control on a maximum level of pollution;
- providing incentives to reduce pollution;
- issuance of tradable permits; and
- extending the role of FEPA into solid minerals mining/ exploitation.

## 6.0 THE REGULATORY FRAMEWORK

### 6.1 Introduction

We have earlier indicated that the sector is important in the economy in view of its potential for generating government revenue, foreign exchange and employment. However, the regulatory and policy framework has left much to be desired. This state of affairs has been attributed to a number of constraints including the absence of a comprehensive geological survey of solid minerals, lack of proven reserves. This section of the report addresses these problems in greater detail. In addition, the chapter reviews the policy framework, including the objectives of the policy changes; beginning from 1999 to 2003, the incentives available to investors, and the position on the subject under the country's development strategy – the NEEDS.

### 6.2 Constraints Facing the Solid Minerals Sector (1962 – 1998)

At the dawn of the inauguration of the civilian administration the sector was faced with a myriad of problems which militated against its performance. If the sector is expected to play the role assigned it, especially contribution to foreign exchange earnings, it is necessary to not only identify the constraints but more importantly, they should form the basis for the policies and strategies of the Obasanjo policy/strategy. The constraints facing the sector included the following which can be gleaned from the various plan documents from the first, up to the rolling plans.

- (i) **Inadequate Policy Framework:** A perusal of the activities in the sector reveals the lack of a comprehensive policy framework that can serve as a guide to investors and all those interested. The sector has depended on bits and pieces of information for the mining operations.
- (ii) **Under-funding:** The point has been made earlier when we discussed the peculiarities of the sector. It was noted that the operations are highly capital intensive. Given the strong government dominance of the sector it implies that all the funding had to come from official sources. Private sector contribution is limited. However, government has been unable to fund the sector adequately.
- (iii) **Out-dated Laws and Regulations:** The laws that form the bulk of the relevant legislations are not only out-dated, but also too old to have catered for the expectations of the post-independence and privatization eras. As at 1998, the national solid minerals policy had yet to be promulgated into law.
- (iv) **The size of the market:** The size of the market for solid minerals is rather small due to the paucity of industries using solid minerals as inputs/raw materials. In addition, having not prepared adequately, operators have difficulty in penetrating foreign markets due to obstacles such as high transport costs, trade restrictions in the form of quotas, etc.

- (v) **Inadequate Infrastructure:** Many of the solid minerals sites are not readily accessible because of the difficult terrain where they are located. Successive governments' plans to link the mineral areas to their final users through rail and roads have not largely materialized. On the other hand seaports are too preoccupied with other activities to have room for solid mineral exports; etc.
- (vi) **Relative High Cost of Operation:** As a result of the topography, soil texture, etc., mining of solid minerals is expensive. In the face of lack of funding from banks, resources are a constraint.
- (vii) **Predominance of Small-Scale Miners:** The CBN (2000a), Kwa (1999) have pointed out that mining in this sector is predominated by artisanal and small scale miners. Consequently, the operations are haphazard and all miners may not pay taxes which constitutes a loss of revenue to the government.
- (viii) **Reliance on Crude Simple Implements:** There is a great reliance on crude implements and the absence of modern mining equipment and procedures. As a result they concentrate on shallow alluvial deposits or outcropping vines.
- (ix) **Low-private sector involvement:** Since after the civil war, the government became the more dominant actor in the sector. In other words, there is low private sector involvement due among other factors, to low profit margin, and a suffocating government control.
- (x) **Inadequate Technical Manpower:** The sector requires skilled and experienced manpower, which is not readily available. For instance, the requirements for geological surveyors had hardly been met. Furthermore, there is inadequate research into the application of the mineral resources.
- (xi) **Absence of an enabling environment:** Solid minerals are exploited in the rural areas, which need to be peaceful to encourage the prospective investors. In the recent past, the level of insecurity has risen disturbingly high and this scares away investors. Moreover, there are inadequate incentives to attract foreign investors. The best efforts as at 1998 towards attracting foreign investors was the NIPC whose operations leave much to be desired.

### 6.3 Development of Policies for the Solid Minerals Sector

The analysis of the policy thrust in the solid minerals sector is divided into two main areas; the first coincides with policies in the period synonymous with regulation and control, which spanned the first to the fourth plan periods, roughly, 1962 to 1985. The second deals with deregulation and down-sizing of government expenditure. Thus the policy thrusts of the first period as per the above were:

- establishment of government institutions that were charged with representing government interest, e.g. the establishment of the NMC, NCC, the NIOMC, and the NUMC;

- participation in the prospecting, exploration, evaluation and processing solid minerals;
- development of manpower for the sector;
- diversification of the productive base of mineral products, for instance, in the Second and Third Plan periods, geological surveys were to be conducted in Jos Plateau, Birnin Gwari, Benue State, South-East, East and South-West; and
- research into efficient extraction methods and wider application of the minerals.

The above policy objectives remained in force until the termination of the fourth development plan in 1985. The objectives were attained with varying degrees of success. At the commencement of the Rolling Plans in 1990, the government noted that the contribution of the sector to GDP fell from 0.67% in 1983 to 0.27% in 1988 (FRN, 1990). This realisation as well as the trend towards a smaller role for government led to modifications in the policy framework.

### **6.3.1 Solid Minerals Policies 1987-98**

A critical scrutiny of the rolling plan documents (1990-95) reveals the moderation of strong government's presence or even domination of the sector, in preference to sharing the activities with the private sector; and the desire to earn foreign exchange from the sector's exports. Specifically, the policy objectives centred on:

- increased exploitation; update of available information or levels and structure of reserves, to ensure long-term conservation and utilization;
- optimal exploitation especially, the minerals with raw material potentials as well as export to boost the nation's foreign exchange; and
- increased private sector participation in mineral exploration and exploitation in the light of government privatization policy (FRN, 1990:139-40).

In the above context, the government made more efforts to exploit minerals like baryte, iron ore, salt, bauxite and bituminous sands. However, the activities were low key as the allocation of funds seemed to lag behind the needs of the sector.

### **6.3.2 Policy on Solid Minerals 1999-2003**

Against the backdrop of the constraints discussed earlier, the Obasanjo administration outlined the following policy objectives and strategies:

### 6.3.2.1 Objectives

- orderly development of the sector for optimum benefits from production and use to enhance growth and improved human welfare;
- contribution to employment generation;
- improvement in government revenue and foreign exchange earnings;
- broaden the production base e.g. raw materials input;
- enactment of a new national policy on solid minerals development;
- establishment of national consultative forum on solid mineral development; and
- more effective measures to check illegal mining activities in place (FRN, 2000).

### 6.3.2.2 Strategies

In order to achieve the above objectives, the government outlined a number of strategies thereto as follows:

- measures to boost domestic demand, ensure value-addition and provide reliable information to investors;
- institutional re-organization and strengthening to effectively perform the role of a facilitator and catalyst;
- carrying out environmental impact assessment to curtail the adverse effects of operations in local communities;
- provision of necessary central infrastructure;
- infrastructural rehabilitation and reactivation;
- production of Nigeria's geological map on a scale of 1:50,000 for prospective investors by 2001; and
- privatisation of some of the sub-sectors (FRN, 2000:29).

## 6.4 Incentives to Solid Minerals Investors

While the sector stood to benefit from the financial and legislations reforms of 1995, namely, the NIPC Decree no. 16 of 1995 and the Foreign Exchange Miscellaneous Decree no. 17 of 1995, there are other specific incentives targeted at the solid minerals sector. These take various forms as provided for in the Minerals and Mining Act (MMA) 1999 such as:

### (i) Capital Allowances

- depreciation or capital consumption allowance of 75% of the certified true capital expenditure incurred in the year of investment and 50% in subsequent years;
- losses in each financial year not exceeding the value of capital allowance for each year, which may be carried forward;
- investment allowance of 5%;

- capitalisation of all expenditure on prospecting and exploration approved by the Minister on the advice of the Director of Mines, where holder starts mining development.
- (ii) Exemption from Customs Duty and Other Benefits

Under this category of incentives, holders of mining lease/licence (ML) shall be granted the following benefits as applicable:

- exemption from payment of customs and import duties in respect of an approved plant, machinery equipment and accessories imported specifically and exclusively for the commencement of the mineral operations; and may after establishment receive additional relief from payment of customs and excise duties for spare parts, equipment and accessories; and
- personal remittance quota for expatriate personnel free from any tax imposed by any enactment for the transfer of external currency in Nigeria.

(iii) Permission to Retain and Use Earned Foreign Exchange

Where the holder of a ML earns foreign exchange from his business, it shall be permitted by the Central Bank of Nigeria (CBN) to retain in an external account, a portion of such foreign exchange for use in acquiring spare parts and other equipment for mining operations which would otherwise not be readily available without the use of such earnings.

## **6.5 Appraisal of the Achievements the Current Administration in the Solid Minerals Sector**

So far, we have identified and reviewed the development in the sector and it appears opportune to address our minds to an appraisal of the current regimes efforts in the 1999-2003 term. Although we have highlighted the policy framework, a detailed appraisal of performance in the solid minerals sector is undertaken below.

To date there have been the enactment of the Minerals and Mining Act no. 34 of 1999, which vests the responsibility for the development and orderly, beneficial and sustainable exploitation in the Ministry of Mines and Steel Development (MMSD). The ingredients of the policy framework for solid minerals are:

- the creation of an internationally competitive, stable, legal and fiscal framework which will be attractive to international and national private sector investors to undertake minerals development;
- provision of a supportive commercial and administrative environment for new minerals development projects; and exploitations;

- design and implementation of administrative provisions to manage the artisanal mining sector, to encourage sale of product on a commercially equitable basis to organizations within Nigeria and to avoid negative impacts on formal mine development, land occupiers and the environment;
  - cessation of Government funding and participation in the management and operation of mineral exploration and production;
  - development of new mineral deposits that can be exploited on a commercial basis;
  - new technical and management skills will be introduced to the minerals development sector through the participation of new investors;
  - increased downstream linkages between mineral exploitation and local industry;
  - private sector mineral development and exploitation companies will operate in compliance with company law, transparent reporting of financial and business performance; and will operate in compliance with internationally recognized good practice standards, for:
    - social responsibility and human resource development;
    - health and safety;
    - environmental management;
    - hazard risk mitigation and emergency response
- (*Guardian Newspaper*, vol. 20 (9026) P55.

The Geological Survey of Nigeria was established as an autonomous agency in 2002. It is worthy to note that although this was one of the agencies established by the colonial masters before independence; and charged with crucial roles in the sector; its status as an appendage of the main ministry militated against creditable performance. In addition, a Director-General has been appointed to take charge of its affairs. Okeudo (2003: 12) has noted the importance of this development when he opined that *“this has infused confidence in the industry as the important assignment of data acquisition, analyses, collation and storage as complements to the nation-wide air-borne geographical survey will be facilitated. The air-borne geophysical survey of Ogun state has been completed. It is to the credit of the Obasanjo administration that the report of an earlier commissioned geophysical survey of Ogun state has been completed. This has provided systematic metallogenic, geophysical/geo-chemical resource definition for drilling and underground development.”*

With the arrival of a new Minister for solid mineral development in July 2005 and the involvement of the World Bank a reform package was embarked upon. The reforms were geared towards improving the ministry’s effectiveness and to help transform the government’s role in the mining sector from owner-operator to administrator-regulator. A restructuring exercise has led to a reduction of service departments (from 4 to 1) and the formation of four new technical departments, namely Mining Cadastre Unit, Mines Inspectorate Department, Mining Environmental Compliance department and Artisanal & Small-scale Mining Department. The broad strategy set out by the then, Minister, Mrs Oby Ezekwesili included:

- development of a national policy with clear direction for the mining sector;
- resolution of conflict over mineral right ownership;
- restructuring the ministry for its new role as administrator-regulator;
- review Minerals and mining Act 1999 to attract investment capital;
- establish a mechanism for granting public access to mineral title;
- strengthen geological capabilities;
- privatise parastatal mineral assets; and
- promote solid mineral investment opportunities;

The Nigerian Mining Cadastre Unit (MCU), set up in 2005, to administer all matters relating to mining titles and rights holds a database of mining licences/leases. Some 300 licences were revalidated by the Unit since its inception. There is an increasing trend of applications for licences/leases, in the last 5 years as shown on the database. This may indicate an increasing interest in solid mineral potential in the country. Over 2180 new registrations (75% have been received in the last 12 months) have recently been entered into the database pending the passing of the new mining law. An inspection of the database entries reveals the extent of recent interest in acquiring solid mineral exploration licences and mining leases shown in Figure 6.1. There are large increases in applications for almost all mineral types, but the greatest interest is shown in registering title for selected base metals, gold and gemstones. As at February 2007 1664 applications had been received under the new licensing system; in the following categories:

(i)	Reconnaissance permit	49
(ii)	Exploration licence	855
(iii)	Mining lease	34
(iv)	Quarrying lease	548
(v)	Small-scale mining lease	178

However, the MCU cannot yet grant or refuse any licence or permit without the promulgation of the new Minerals and Mining Law. As a result these and later applications are frozen in the system.

The MCU operates in an efficient and transparent manner. All applications are dealt with on the 'first-come-first-served' principle which accords with current thinking of best practice. In addition, consideration is being given to the allocation of former state owned mineral company licences and title, on a tender basis as part of a privatisation process. This approach is also being adopted in countries which are undergoing change in their mining cadastre and ownership system e.g. Afghanistan and DRC.

The unit appears to be well run and has structures in place to be managed in an independent, efficient and transparent manner.

As is required in modern mining laws, holders of Mineral Rights shall:

- Maintain positive relations with recognized land owners and communities;
- Comply with health and safety regulations; and
- Protect the environment.

Commodity	Licence/Lease	
	Extant	Applications
	Applications	Pending
All minerals - non specific	1	300
All metallic minerals - non specific	19	218
Baryte	6	109
Base Metals (Cu/Pb/Zn)	4	228
Base metals (Sn/coltan)	9	313
Bentonite	6	14
Bitumen/Tar sands	0	7
Clays	10	11
Coal	3	62
Gemstones	11	159
Gold	19	218
Granite	151	332
Gypsum	1	50
Iron Ore	1	26
Kaolin & Feldspar	6	39
Limestone	22	97
Phosphate	0	15
Sand and gravels (various)	16	203
Talc	0	7

Source: Mining Cadastre Unit, MMSD, Nigeria

**Figure 6.1: Entries in Mining Cadastre Database**

Moves towards privatisation of moribund parastatal mineral assets have been noted:

- First in this direction is that government has made its mining corporation (NMC) a holding company to manage its interests in fifteen (15) joint ventures. This according to Okeudo is to prepare them for privatization;
- Increase in foreign collaboration in joint venture companies (JVC). The Ukrainian-Nigerian joint venture. Unlike in the past, this joint venture is not between governments, but private companies from the two countries contrary to the old practice; and
- Establishment of a bilateral economic agreement with the republic of South Africa-based company in 2000. The main aim of the agreement is to exploit the minerals with high commercial value. Here, Nigeria is expected to tap into the company's expertise in coal mining and utilization.

There are other joint ventures between companies from China, Netherlands, Austria and Germany with various Nigerian interests in the sector. This indicates some recognition of the sector by foreign investors.

- The implementation of the Bitumen project in Ondo state. Since the administration assumed office in 1999, it commissioned the exploitation of the Bitumen at Ondo state. It is on record that in 2002, two companies with strong foreign capital base, technical know-how and management expertise picked up the two available blocks of bitumen for development.

The Mining Inspectorate Department was established, with the general duties of:

- supervision of mining, quarrying and explosives;
- ensuring that proper mine design and operating guidelines are followed in respect of health and safety; and
- assessment, preparation and rendering of mineral returns.

Mineral returns have been processed since 1997. However it was noted that old data is likely to have been underreported especially in the informal mining sector (estimate 70%), due to lack of close inspection; self submission and dishonest disclosure of volumes extracted.

All current mining activity is artisanal or small-scale by type with a small number of illegal operations which will be addressed by the authorities following the introduction of new mining legislation. Consequently, the need to establish a separate department dealing with the affairs of the ASM sector was recognised. The function of the Department, established in 2005, broadly involves the implementation of the provisions of the Minerals and mining Act and the formulation, recommendation and implementation of government programmes and policies for the support and promotion of ASM. Policy development involves the formalisation of the informal mining sector, encouraging co-operatives, receiving applications for registration, helping to empower by facilitation of external services and finance. Sub-offices are based in 14 states, covering all geopolitical zones in the country. The establishment of Buying Centres for mineral product are being encouraged aimed at adding to the knowledge of market behaviour and improving the market chain process.

Another important achievement of the administration is the organization of the other wise unorganized miners into cooperatives, small scale industrial concerns and Limited Liability Companies. According to Okeudo, this effort derives from the realization that in their old forms the miners relied on crude techniques and tools because they lacked the wherewithal to acquire the equipment necessary for their operations.

The Nigerian Investment Promotion Commission (NIPC) registers all companies with foreign

interest up to 100 per cent or in partnership with Nigerians. However, before a registration certificate is granted, the NIPC ensures that the company meets the stipulated guidelines including those that will ensure environmental friendliness. Mining companies are required to produce additional license certifying them competent to engage in that line of business. These additional certificates are issued by Ministry of Mines and Steel Development.

The reforms and abolition of the Exchange Control Act of 1962 and the consequent liberalization of capital transfers were designed to make foreign direct investment (FDI) more attractive in general. This is supported by the participation of the Central Bank in the activities of the newly established Nigerian Investment Promotion Commission (NIPC), which now provide a 'one-stop-investment-centre' to facilitate FDI, assisting foreign investors with regulatory, bureaucratic and institutional support for investment in Nigeria. Investor registration, processing and approval is reported to be faster and NIPC has seen a 75% rate of growth in the last 15 months. The Ministry of Mines and Steel Development (MMSD) have a permanent presence at the centre which has serviced approx 100 investor enquiries in 2006 and over 20 in the first quarter of 2007. These inquiries have been drawn mainly from India, China, Thailand and Canada. A broad interest in all solid minerals is expressed, but the greatest interest appears to be in tar sands and gold prospects, with a lesser, but significant interest in gemstones, tantalite, limestone, coal and dimension stone. Potential Foreign Direct Investor's (FDI) are referred to the Nigerian Geological Survey Association and Mining Cadastre Office for further information and registration of licence/title where appropriate. Tracking conversion of interest expressed by potential investors into mining operations is not practiced hence it is difficult to quantify the success of the centre in attracting FDI.

The stated investment incentives for solid minerals are seen as attractive in comparison to other global players;

- 3 to 5 years tax holiday;
- Low corporate tax of 20 – 30%;
- Deferred royalty payments depending on magnitude of the investment and strategic nature of project;
- Capitalization of exploration costs;
- Extension of infrastructure to sites;
- Capital allowance
- 5% investment allowance;
- Exemption from customs and import duties on agreed mining equipment;
- Roll-over relief on capital gains tax for replacement of plant and machinery; and
- Repatriation of profit and dividends.

The establishment of one stop investment centre (OSIC): In reaction to the problems often encountered by prospective FDI's, the government through the NIPC in 2006 established this

agency to streamline the registration processes by its clientele. OSIC offers a range of services success

- Company incorporation and registration;
- Business permit and registration;
- Tax Registration/Clearance;
- Work permits and other immigration facilities;
- Facilitation of Customs clearance for investment projects;
- Information and data on Nigeria's economic sectors and industry;
- Familiarisation on Nigeria's regulatory environment; and
- Sorting out of any administrative entry barriers confronting local and foreign investors.

The Targets of OSIC are:

- Providing Business Entry approvals and authorizations within 24 hours;
- Respond to inquires within 48 hours;
- Providing an electronic payment system to further enhance transparency, speed and convenience;
- Being courteous in our dealings with clients at all times;
- Treating our Clients honestly and on the basis of mutual trust and utmost respect;
- Transforming OSIC into a digital one-stop shop before 2010 for global access;.
- Establish branches of OSIC in Lagos (2007) and other locations subsequently;
- Maintaining a policy of Zero Tolerance on Corruption; and
- Emerging as the best one-stop shop in Africa.

OSIC Strategies: The strategies adopted to achieve its goals include:

- Upgrading the way we deliver our web services in line with improvements in technology and the changing needs of investors;
- Working closely with investors to evolve value added services;
- Communicating with investors in other international languages;
- Becoming fully automated in our operations; and
- Ultimately transforming OSIC to a digital status.

Approach to Service Delivery: For effectiveness and efficiency, OSIC adopts a TEAM Approach in that it works with thirteen (13) agencies, which are in charge of relevant aspects of incorporating a business and operationalising it. The agencies and their respective roles are set out in Table 6.1 below.

**Table 6.1: Participating Agencies in OSIC**

Agency	Functions/ Role
NIPC	Registration of Foreign investments, Issuance of business Permits, Complaint Management, Linkages with NIPC Departments, and other Government Agencies, Countrywide liaison with the 36 States on investment matters, etc.
Corporate Affairs Commission	Name searches, Company Incorporation and Registration
Nigeria Immigration Service	Expatriate Quota Positions, Regularization of Permanent Work Permits, other immigration facilities
Nigeria Customs Service	Issuance of Import 7 Export Guidelines, Procedure for citing Excise Factories, Goods clearance facilitation and general information on fiscal policy issues.
Federal Inland Revenue Service	Tax Registration, Payment of Stamp Duties, Issuance of Tax Clearance Certificates, Issuance of Tax Forms and general information on tax matters.
National Office for Tech. Acquisition & Promotion	Registration of contract agreements dealing with Transfer/ Acquisition of Technology; Approval/ licenses for Technology Transfer, Patents and Franchises etc.
National Agency for Food & Drugs Administration & Control	Registration of Regulated Products, Issuance of Export Certificates, Authorization to import of Unregistered Products.
Standards Organization of Nigeria	Facilitates all aspects of Standardization activities, approvals or permits for use of standards. Provides guidelines to investors.
Fed. Min. of Mines And Steel Development	Exploration Licenses, Mining leases and information and guidelines on investing in the solid minerals sector.
National Bureau of Statistics	Statistical Data on the Nigerian Economy by sectors and industry
Ministry of the Federal Capital Territory	Land Matters on investment projects and general information on investment opportunities in the FCT.
Federal Ministry of Finance	Administration of industrial incentives, Tariff Administration and general information and guidelines on fiscal policy.
Central Bank of Nigeria	Provision of information and Technical Advice on the Nigerian, Banking and Financial System, guidelines on correspondent banking and funds transfer, including capital importation.

Source: NIPC (2007), Abuja.

Data available from OSIC indicate some appreciable performance. For a ten-month period of its existence it has rendered services in diverse areas such as technical information/ advice, incorporation of companies, granting of permits and licenses, etc. Table 6.2 provides the details.

**Table 6.2: Achievements of OSIC 2006/07**

Number of Inquiries Attended to	1,956 Enquires (8 – months)
General information to Companies	770 Companies
Grant of Business Permit	157 Investors
Company Incorporation	40 Companies
Various Approvals by Immigration	106 Companies (1650 Investors granted quota slots and work permits)
Applications for Investment Land (FCT)	20 Projects
Facilitation with other Government Agencies on behalf of investors	45 Business Groups/Investors.

## **7.0 CHALLENGES OF THE SOLID MINERALS SECTOR**

### **7.1 Introduction**

Mining companies are considered to be ‘frontier’ companies”. They are usually the first to invest in politically sensitive or recently reformed countries but this is not without significant challenge. Half the fifty or so countries with large mining sectors are considered to be ‘low income countries’ in Asia, Latin America and particularly Africa. Mining has been shown to have the potential to bring extensive economic benefits by attracting substantial foreign direct investment, providing:

- an appropriate legal and policy framework is in place;
- an adequate level of political stability exists; and
- property rights are well defined.

The opportunities that an established mining sector, irrespective of size of operation, can provide are:

- Hard currency earnings;
- Government revenues;
- Jobs;
- Education and skills development; and
- Development of infrastructure (roads, electricity, water, telecommunications...)

This section of the report deals with the challenges faced by potential mining operators (large and small) in the global mining sector in general and in Nigeria in particular.

### **7.2 Universal Challenges in the Global Mining Sector**

The Mining, Minerals and Sustainable Development Project (MMSD) research report suggests that there are nine major challenges faced by the mining sector. These are addressed below:

(i) **Viability of the Minerals Industry**

Whilst sustainable development should be an import concept in the minerals sector, companies struggle to translate it into financial success. The financial justification comes from resultant lower costs, wider choice of lenders and insurers, and better market reputation. Several tools, including corporate strategy and policy, management programmes, formal risk management procedures, implementation and auditing of internal objectives and targets, project appraisals and core staff training schemes are commonly used to incorporate the principles of sustainable development into corporate practice, but with limited scope.

Switching from concepts of shareholder costs, to those of shareholder value will encourage a more disciplined and systematic approach to sustainable development.

(ii) The Control, Use and Management of Land

Exploration and mining activity pose challenges with regard to land access and management, and these are best addressed via an integrated land planning framework, to balance competing interest between national and local levels. Decisions regarding trade-offs in different domains can only be achieved by including and negotiating with Project Affected Peoples. Equitable and inclusive rules of tenure, compensation schemes, and strong governance, including arbitration will improve the planning process.

Companies should seek consent to gain access to land, even when this is not a legal requirement, particularly where indigenous peoples are concerned, and their role in the decision making processes should also be respected.

With regard to resettlement, mining companies should ensure the maintenance of living standards, the preservation of community and social ties, fair compensation for loss of assets and economic opportunity, amongst others, and roles and responsibilities for ensuring long term well being, via monitoring, needed to be established.

Protected areas are key to the conservation of key ecological, social and cultural values, and broader discussions regarding management and trade-offs should take place. The local stake in the success of protected areas and available resources for management need to be increased, and whilst minerals development may help to fill these gaps, there is still suspicion of proposals to mine in or near protected areas.

(iii) Minerals and Economic Development

Minerals development is hard to justify if economic benefits are not experienced, especially in areas that lack alternative sources of development. In addition to gains via taxes and royalties, benefits should include employment, infrastructure e.g. roads and hospitals, linkages to industries supplying goods and services or to industries that process mineral outputs; and technology transfer. Historically, sustained economic development has not always occurred, and sudden wealth can be detrimental to social and political life, leading to corruption, authoritarian government, human rights abuse or armed conflict. Shortfalls in economic resources, institutional capacity and political will are often the source of inequities and underdevelopment. Better ways to capture and manage mineral wealth are required.

(iv) Local Communities and Mines

Community relations with mining companies are not always good. As community demands for relevant, direct and sustained benefits from mineral wealth are a recent phenomenon, neither governments nor companies, or communities themselves are adequately equipped to respond to them. Weak governance can result in communities turning to operating companies, who find themselves providing development services to obtain, or maintain their social licence to operate. New initiatives focus on improving the capacity of local government and other local institutions to deliver benefits over the long term. NGOs and other civil groups can act as independent mediators, implementing partnership actions between companies and government.

Revenue received by the community should be determined through a democratic process, and one of the best options is via a collaborative approach. Benefits from minerals development must be sustained beyond the life span of the projects. These can be via support for local businesses, preferential procurement policies towards local suppliers and distributors, employment of locals, and skills training.

To date health services provided by companies to employees and communities have generally reflected inadequate understanding of local needs, and an inability to sustain such services after the operation closes. Beyond work related diseases, few attempts are made to prevent diseases affecting the wider community or to consider their wider well-being. Independently run multi-stakeholder forums can facilitate community awareness, capacity building and involvement, whilst reducing the power differential between the company and the community.

(v) Mining, Minerals and the Environment

Even the best modern mining operations have some undesirable environmental, and good practice has far to go before it reaches all parts of the industry. Improved performance should ensure the maintenance of critical natural capital, the enhancement of ecosystems and to net environmental continuity via minerals wealth. The main challenges are as follows:

- Large volume waste – issues of disposal, and storage lead to significant environmental impacts.
- Mine closure planning – a plan needs to be drafted at the outset considering both environmental and socio-economic aspects of closure, to ensure sustainable development.
- Environmental legacy – Impacts from previous operations can be long-term and community and financial costs are on going.
- Environmental Management Systems – Environmental Impact Assessment (EIA) is the most commonly used tool for environmental management, and is now

mandatory for most large-scale development, but is often poorly implemented. Socioeconomic factors are now included, as part of an integrated impact assessment. The aim is to integrate environmental responsibilities into every day management practices.

- Biodiversity – Governments have struggled to create incentives to encourage conservation, but the Convention on Biological Diversity provides the minerals sector with a politically sound basis for engaging in dialogue and partnerships with the biodiversity community, providing a key instrument for sustainable development.

(vi) An Integrated Approach to Using Minerals

The use and downstream supply of mineral products have implications for sustainable development, and should be considered in conjunction with mining and processing of minerals. Much of the concern, policy and regulation regarding mineral use focus on environmental issues, health risks associated with use and long-term resource availability. There is a drive to increase resource efficiency via recycling, product re-manufacture and re-use, substitution, and in some cases avoidance of use. It is primarily a government responsibility to balance uncertainties regarding environmental and health risks of certain mineral products using the precautionary approach.

(vii) Access to Information

Openness and transparency in information production and dissemination in the minerals life cycle are key to sustainable development. Authoritative, independent sources are essential to ensure legitimate information and to ensure stakeholder access to accurate and relevant data. Accountability and verification are essential for monitoring performance, and open information regimes are critical to more efficient economic decisions by all, and effective public participation in decision-making.

(viii) Artisanal and Small-Scale Mining (ASM)

Worldwide, many deposits are exploited by artisanal and small-scale miners, who are often poor, exploiting marginal deposits in harsh, dangerous conditions, working with simple tools and equipment in the informal sector, often outside the legal and regulatory framework. ASM is an important part of rural livelihoods, and the only income opportunity available, but can be very disruptive, causing a local 'rush' of in-migration, or people deserting their farms, and ultimately resulting in social and environmental damage. A lack of awareness coupled with a lack of information regarding affordable methods to reduce impacts, or incentives to change contribute to the inherent environmental and social problems. For more details see Section 6.3 below.

(ix) Sector Governance: Rules, Responsibilities, and Instruments for Change

Achieving effective governance is a major challenge facing the sector and is a key to dealing with many of the challenges previously highlighted. Poor governance can be due to numerous factors such as a lack of resources and capacity, power imbalances, a lack of political will, a lack of coordination and integration, or a lack of representation of stakeholders in decision-making. At the extreme, poor governance can be coupled with abuses of human rights and conflict between different parties. Sustainable development requires understanding, and definition of the roles, rights and responsibilities of all actors, and needs to focus on capacity building throughout the sector. Governments have a central role in improving governance for sustainable development through a national policy framework, regulation and enforcement.

Some consider that the biggest challenge to mineral investment is the paucity of quality geological information. Some of the other more ubiquitous challenges of doing business in Africa are identified as:

- fluctuating currencies;
- bureaucratic 'red tape';
- bribery and corruption;
- nepotism;
- wars and civil disturbance;
- lack of access to local capital;
- monopolies i.e. marketing boards, state trading firms, foreign exchange restrictions, trade taxes and quotas place a disincentive on exports;
- lack of sound infrastructure.

### **7.3 Challenges in the ASM Sector**

As a basis for defining small-scale mining an annual output of 100,000 tonnes per annum is generally taken as the upper limit for small mine production. A wide range of mining operations can be covered within this production range, from the very small hand-excavated workings through to a large number of semi and fully mechanised mines. As output becomes closer to 100,000 tonnes upper limit, access to capital and technical staff is likely to be better and a higher degree of mechanisation will be utilised. A change in the scale of operations tends to be gradual, from very small to small or medium and is related to the equipment and the manner in which it is used.

It is the selection of equipment for these operations that effectively determines the method of operation and the output or rate of production. The criteria for equipment selection and mining method are:

- (i) Ground condition

- (ii) The ability to dig ground is determined by:
  - Intact ground strength
  - Competence of the ground
  - Abrasive properties of mineral
  - Bulk density of ground
  - Flow properties of broken ground
  - Type of deposit
  - Most ASM miners have limited proven ore reserves despite often possessing title to large resource blocks. This is mainly due to a lack of technical and geological knowledge. This creates difficulties in accessing finance where the extent of reserves and resources cannot be quantified. They also have limited access to capital funds and operate on a short life expectancy. As a result, the ASM miner will be forced to use simple technology and equipment that is relatively inexpensive and easy to operate and maintain.
- (iii) Shape of deposit and terrain
- (iv) It is expensive to establish the geometry of a deposit, since this will involve geological mapping and site investigation. Terrain observations, on the other hand, can be carried out relatively simply. The shape of the deposit and the surface will affect the choice of equipment in terms of manoeuvrability and amount of overburden removal.
- (v) Movement of material
- (vi) It is important to choose a mining system that minimises the amount of rehandling of material involved on site, to avoid wasted effort.
- (vii) Rate of production
- (viii) The life of the mine will be determined by the amount of available reserves divided by the annual output.
- (ix) Access
- (x) The type of ground conditions and infrastructure will have a direct effect on the type of equipment used.

As a result the ASM miner may have to rely on hand-tools, wheelbarrows and small items of mechanical equipment for ground breaking and mineral handling. Standard commercial equipment used in large-scale production operations is of high capital cost and are likely to be out of reach for individual small-scale operations, but may be affordable on rented, shared or co-operative terms. Specially manufactured equipment is becoming available, designed specifically for ASM miners and locally made at low cost, based on existing designs.

To be effective, ASM equipment should, ideally:

- require small capital cost or be small enough in scale to be affordable to local groups;

- use locally available materials;
- be relatively labour intensive, but more productive than many traditional technologies;
- be understood, operated and maintained by local people without a high level of training;
- be produced in local workshops;
- be flexible and adaptable to local conditions;
- harmonise with local needs, traditions and environment;
- extend human labour and skills rather than replace them;
- emphasise self reliance and local production to meet local needs and;
- minimise the impact of infrastructure limitations and the shortage of highly trained manpower.

Estimates of costs to upgrade small-scale manual working to semi-mechanised operations range from US\$ 10,000 – 100,000's according to the sophistication of mining and processing methods required. Whilst availability of capital is one factor involved in raising the quality of technology employed, legal, marketing and technical skills also need to be acquired if the transition in scale is to be achieved and maintained.

Small-scale mining is a business. As a small business it should be organised along business lines and like any other business the aim is to make a profit or those operating it will not be able to make a living and will abandon the work. When going into business it is necessary to consider planning, finances, accounting, technical knowledge and experience.

ASM is highly speculative. A high element of risk is involved in the industry but the potential rewards are high. To be sustainable, sound business practice is required in dealing with matters of organisation of labour, partnerships and other joint ventures procedures including commercial aspects of buying and selling minerals.

Those involved in ASM generally have to sell their products as quickly as possible to realise cash and often receive low prices. The traders, merchants, intermediaries and manufacturers tend to make larger profits. This is emphasised when the operations are illegal and are sold in a 'black market'. A number of ways have been suggested whereby ASM profits can be increased by:

- establishing processing industries which are owned and controlled by the ASM operators, such value is added to the raw material e.g. gemstone products may be transformed locally through cutting and polishing; quarried dimension stone can be converted into tiles and slabs. While this may be achieved by investment in the informal sector, the chances of access to capital are improved if the projects are supported by government agencies operating within the formal sector;

- diverting ASM mineral products to domestic manufacturing centres e.g. In Bolivia, small-scale miners produce gold on legally granted concessions, but tend not to declare or pay tax on their output. Consequently, Bolivian jewellers who wish to operate legally have often found it simpler to use imported gold. In order to help the jewellery industry, the Bolivian government has therefore established a system of 'auto declaration' for gold purchased from the informal market. Jewellers who wish to export their products simply have to include the value of locally bought gold as a deductible cost and they can then export the products exempt from value-added tax. This has helped make the industry more competitive internationally, and has also formalised at least one part of the production chain.
- accessing the 'fair trade' market for ethically sourced commodities. There is a movement amongst consumers to source products that have not led to unacceptable levels of environmental damage, played a part in fuelling conflict or have been generated under exploitative conditions. If it can be guaranteed that ethically and environmentally sound practices have been used in the production process there is evidence that consumers are prepared to pay a premium price. Some NGO's are acting as trading companies and have established direct links with ASM co-operatives, particularly in respect to jewellery. Direct selling has the added advantage of ensuring that the producers get better and more stable prices without having to trade through a 'middle-man'.

#### **7.4 Financing the Sector: - Local and International**

The level and amount of international mining investment has been increasing year on year since the mid 1990's, due to the potential for high returns, demand for metals and the need for diversification of risk by multinational companies. The risks involved are the same risks as domestic investing plus heightened concern over political, sovereign and financial risk. A Political risk is one that a sovereign host government will unexpectedly change the rules under which businesses operate i.e. Expropriation risk, disruptions in operations, protectionism, blocked funds or loss of property rights. Whereas, sovereign risk involves the possibility that:

- The foreign country's government may collapse
- Its legal system is inadequate
- Its police force can not maintain order
- The settlement process may occasionally break down
- Other political upheaval may occur

Financial risk refers specifically to sensitivity of project costs and revenues but more generally to unexpected events in a country's financial, economic, or business life.

Multinational investors therefore require a higher internal rate of return from projects based in riskier countries and some investors may seek to obtain a guarantee from government officials. Mostly, however, investors in mining ventures will refuse to invest unless they expect a higher return to compensate them for the international risk premium.

Any operation requires a degree of financing before it can begin. Whilst the initial finance for ASM working may be low, if the operation is to develop the introduction of equipment and techniques may be required to improve efficiency and ultimately income. Lack of capital is a distinct and major obstacle to mechanisation and improvement in efficiency, which can break the spiral of low productivity, low revenues and low wages. ASM miners and their organisations have few assets that banks will accept as collateral.

Investment in tools and equipment, even at a modest level, should result in increased productivity, increased revenues and improved reserve base. However, access to credit is fundamental to ensuring a sustainable small-scale mining sector.

It is accepted that lending institutions have to be able to make independent decisions and charge interest rates which are sufficiently high to cover inflation and operating costs, including loan losses, and also have enough clients to permit economies of scale. A preferred strategy is to ensure that loans are combined with the borrowers' own savings, and to start with small loans and then move on to larger ones that become part of a longer term relationship. Donors also need to sustain their links by helping to build the capacity of lending institutions and maintaining an interest in their control and supervision. As stated earlier, finance for small-scale mining need not, however, be confined to banking and credit schemes. Loan guarantees, micro-financing schemes, equipment leasing and hire purchase arrangements can help to ease the situation. Funds can come from a range of more specialist institutions, such as exploration funds or mining development banks. Other ways of channeling finance to miners include selling shares, and establishing joint ventures.

Whilst, government leadership is essential to enable mining permits, exploration, credit and markets to be found the formation of consultative groups between ASM the financial agencies and government can be successful in providing and directing the necessary technical and financial assistance. Given the correct support and guidance, where needed, ASM operations have the potential to provide an income to the workers and an economic boost to the area.

Many very small operations are undertaken by an individual working on his/her own it is common for labour to be pooled to achieve increased productivity. This may be simply achieved within family groups but more often a partnership, association, co-operative or joint venture will be formed to share resources and tasks as the mine becomes larger.

The main points associated with these arrangements include:

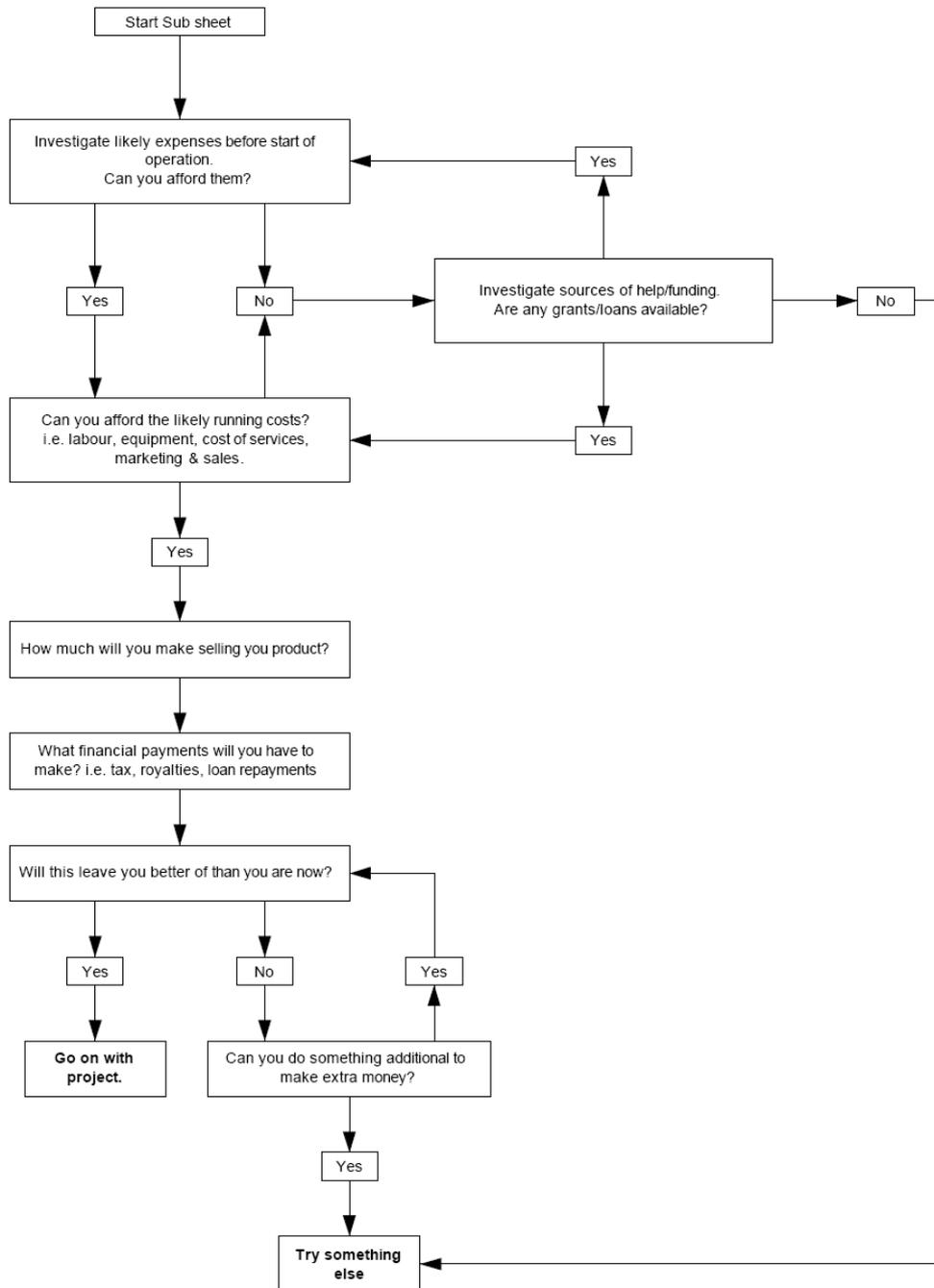
- Working cooperatively;
- Organisation of individuals work;
- Cost sharing;
- Profit sharing and loss sharing; and
- Arrangements for payment.

It can therefore be seen that there are a number of inter-related technical and economic categories, which need to be addressed in any pre-development project involving mineral extraction. Government agencies and private investors undertake mineral property evaluation, in each case the evaluation criteria needs to be clearly defined in order to provide a basis for evaluation. These criteria can loosely be grouped under the following headings. Knowledge of these criteria will be needed in transforming project ideas into broad investment propositions.

- **Technical Factors** – including geology, resource estimation, mineability, processing, infrastructure and construction requirements.
- **Cost Factors** – including capital and operating cost estimates.
- **Marketing Aspects** – including knowledge of consuming industries, supply and demand relationships and pricing.
- **Economic Viability Studies** – including cash-flow forecasts and sensitivity to changes.
- **Legal and Environmental Factors** – including rights and ownership arrangements, environmental considerations and socio-economic impacts.

Whilst the strategy for assessing the techno-economic environment under which large scale mining operates, is well documented, the circumstances of small-scale mining are somewhat different. In many respects the same factors need to be addressed. In that regard, a company will be required to submit full details of mining and processing methods and technology, the financial package, an environmental management plan and the training and local benefits to achieve sustainability. It is not practical for the same level of detail to be involved in an ASM venture, but there still needs to be a proposal as to what will be mined and with what methods and how financing will be arranged. Some ASM miners who have an industrial mineral operation and deposit, which has the potential for increased production, could fall into a financial trap. Generally, the miners do not have enough money for improving mining and processing equipment. They may therefore, face a situation where they have to sell their operations rather than being able to develop it themselves.

The flowchart in Figure 7.1 illustrates the questions which need to be answered before commencement of mining operations.



Financial decision flowsheet (After Campbell, 2001).

**Figure 7.1: Questions Prior to Commencement of Mining Operations**

## 7.5 Capacity/Integration of Approach/Risk

In terms of investment in the minerals and mining sector, continuity, but more particularly, stability and consistency of approach to mineral development, will be crucial. Any potential investor is likely to want to feel confident that the legislation (good or bad) is at least consistent in its application. For example, DRC is currently experiencing a boom in

investment in the minerals sector, and whilst the political regime may not be considered 'good' in absolute terms, it is at least stable (if not consistently 'bad'), so any potential investors can feel fairly confident that in years to come, there are not likely to be any significant changes in political risk.

- Clear mining rights and title;
- Clear tenure and control;
- Attractive and competitive fiscal conditions;
- Political transparency and stability;
- Good communications and infrastructure; and
- Reinforced institutional capacity.

ASM provides an opportunity for sustainable economic growth and livelihood in rural areas. The problems and solutions have largely been identified. The implementation of those solutions is however, difficult. Governments need to take a pro-active role, taking the leadership of the normalisation process at the national level.

- provide a solid base of geo-scientific information for exploration and land use advice. This information is essential for attracting exploration investment and for effective planning and decision making by all levels of government;
- economic and social benefits can be obtained by encouraging development of the minerals sector; and
- challenge to overcome the obstacles and impediments to investment.

## **7.6 Particular Challenges Identified in Nigeria**

### **7.6.1 *Attracting Foreign Direct Investment***

To gauge opinion of potential overseas investors with regard to investment into mining projects in Nigeria, formal and informal interviews were sought with a range of stakeholders in the international mining sector. This was undertaken by WAI staff at mining promotional events (Indaba, Feb. 2007 and Promoters and Developers Association; Canada, Mar. 2007) and by meetings with selected companies and agents in London in March 2007.

The opinions expressed ranged from broadly positive general interest in solid mineral development potential to negative statements concerned with the perceived investment risk associated with mining projects in the country. The strongest positive comments were expressed by operators and banks familiar with working in the Sub-Sahara, whilst financial advisors (NOMADS) expressed the most caution. A summarised version of comments is given as follows:

- The lack of a recent successful track record of large scale mining mitigates against major investment;
- Recent promotional events are helping to spread knowledge but more geological understanding of deposits is needed;
- Mining potential at depth is generally unproven;
- Main international interest is in metals (precious, base, ferrous and non-ferrous);
- If a mining project is shown to be good enough and financially sound, funds can be found;
- Reliable, well established in-country partner, preferably with mining and market knowledge is required;
- Trusted professional relationships could override concerns about in-country problems;
- Geological and financial risk can be factored into project appraisal but political risk is considered to be uncertain and consequently Nigeria falls into the high risk category;
- Comparable projects in other countries may be favoured, due to perceived political instability in Nigeria;
- Encouraged that regulatory framework is being updated and should be conducive to mining investment, but the application of those legal instruments have not been tested to ensure consistency over time;
- There are perceived advantages to be had by 'first movers' which may attract small or medium sized exploration companies, promoters or speculators;
- Negative media coverage has led to concerns over corruption, violence, security, political stability and transparency;
- The country is considered to suffer from infrastructure problems with electricity supply, water supply and fuel supply being the most critical elements; and
- There were no objections to investment in Nigeria *per se*.

Other obstacles to investment identified during the consultant's discussions are listed below:

- Volatile security situation, particularly for foreign nationals;
- Lack of or poor infrastructure (roads, rail and power supply in particular);
- Government control (privatisation process not complete, new laws untried)
- Perceived as high risk (geological and sovereign);
- Shortage of trained and experienced mining workforce; and
- Lack of access to local capital.

### **7.6.2 Extent of Geological Knowledge of Solid Mineral Deposits**

The efforts by the government to attract local and foreign investors in the Nigerian solid minerals industry is set to continue, but except for a few commodities, the extent of the

countries mineral resources are not considered to be of sufficient size to attract international interest (Mobbs 2004). While some exploration and ASM exploitation for higher value commodities, such as gold, gemstones and precious metals, has been undertaken there has been little detailed mining or geological investigation beyond 'scratching the surface'. There is some knowledge of resource assessment of minerals for domestic consumption and pockets of work have been recently carried for barite, gypsum and pegmatite's.

The Nigerian Geological Survey Agency is responsible for national geo-science data management and information services. The majority of the country's geological knowledge and data collation of solid mineral deposits was undertaken in the 1960's and 1970's and in some cases much earlier. Consequently the information is very dated and until recently, the issue has not been addressed.

The Agency became operational in 2003, with its function being to organise and verify historic data, and to undertake some early stage simple geology in order to provide interested potential foreign and domestic investors with enough information so they can form an educated view on the prospectivity of a region. The NGSA Customer Service Centre acts as an interface with and reception point for potential investors. It can provide copies of Geological maps showing solid geology and mineral resource maps at 1:2,000,000 and 1:1,000,000 scale (paper and electronic versions available). Several promotional documents dealing with exploration opportunities in different minerals are available from the centre. NGSA field staff are conducting studies on mineral occurrences (geochemistry, chemistry and mineralogy) and are updating geological maps. Aerial geophysical surveys are underway and are due for completion (44%) planned by end 2007, but the work financed under the World bank project (56% of the national territory) will only begin in July-August 2007.

Since, the computerisation of data, large-scale geological mapping, geochemical sampling and airborne geophysics has not yet been completed, meaning quite simply, the risk for an early stage explorer is much greater. Undertaking such work is standard procedure for countries interested in promoting their mineral potential. Foreign interest should be increased when the full suite of information is available.

The assessment of economic geology has been given a low priority by the NGSA as a result there is little capacity to interpret, appraise and evaluate solid mineral potential.

The majority of geologists are drawn into the oil industry as a result there has been very little exposure to field work for solid minerals. NGSA consider that there is a good background knowledge of the basic geology of the country, but mapping programmes will progress at 1:50,000 scale which may be more useful to mineral prospectors.

The minerals targeted by the NGSA in their field mapping programme are reported to be barite, bentonite, copper, gypsum, iron ore, limestone, manganese, marble, nickel,

phosphates, silver, tantalite, pegmatites and gold. The choice of minerals appears to be based on *ad-hoc* customer enquiries. This is not considered to be the best approach. It does not provide a sufficient clear strategy or focus for allocation and management of scarce NGS resources. Consultation should be undertaken in discussion with MMSD and other stakeholders based on economic geology (mineral deposit modelling and ore forming processes) to prioritise and consolidate its activities towards those minerals which could provide the greatest potential economic benefit to the nation. Best practice strategy for targeting minerals depends upon the geological make-up of the country but can be generally expressed in the following order:

- (i) Mineral deposits which are geologically well known, with substantial quantification of resources, of world class size with good prospects of early production of high grade ore and good market conditions for reference see Yank Cu Au deposit development by British Geological Survey and Afghan Geological Survey;
- (ii) High value deposits, low tonnage, easily processed and transported, gains for foreign exchange, requiring little investment to generate good rates of return with known market potential (e.g. gold, gemstones rare earths and precious metals for reference see Mali Geological Survey);
- (iii) Large deposits of high tonnage, high value, medium difficulty of processing for which there is a regional market and benefits for foreign exchange (e.g. base metals, iron ore, dimension stone)
- (iv) Large deposits of high tonnage, lower value, medium difficulty of processing for which there is an established domestic market and benefits to be gained from import substitution (e.g. barite, gypsum);
- (v) High tonnage, low value, difficult to process etc...

Consideration should also be given to re-orientating the current regional mapping programme towards more thematic, project based data capture, interpretation and product delivery in areas having natural resource potential.

## **7.7 Developing the Local Mining Sector**

All mining activities currently undertaken in Nigeria are carried out by either artisanal or small-scale operations at or near-surface. They may work in isolation, through co-operative ventures, shared work schemes, enterprises or other business structures. Some are members of a mining association. When governments are developing policies for formal sector activities it is convenient for them to consult with a trade association who can represent the views and interests of the whole sector. This is often difficult to achieve with ASM, but the existence of a well established NMA should be an advantage.

The association which purports to represent their interests is the National Miners Association (NMA) based in Jos, Plateau State. A meeting with the Executive of the NMA, MMSD staff,

World Bank PMU representatives and the author was held on 20 March 2007 to discuss the challenges that they meet. In addition site visits were made to a number of ASM operations in a range of commodities in Nasarawa, Kaduna and Plateau State to seek views of operators and the problems that they face. The following details relate to the recorded opinions of the author and the representatives interviewed.

- **Lack of access to finance:** The single overriding complaint raised by all was the lack of capital finance. Half of the problems faced by NMA members are considered to be poor access to funding and high borrowing rates. The repayment rate for short term loans is estimated at 15-40%. A short term loan (less than 2 years) is not considered appropriate for mining projects which have much longer pay-back periods than banks are used to handling. At present a mining lease is not recognised as collateral. Local banks are thought to be scared of mining risk and operators have no ready means of access to investment from foreign banks. The knowledge gap in Nigerian Banks needs addressing by capacity building, in-concert with the improvement in understanding by ASM operators of the financial market requirements e.g. cash-flow, business plans and project forecasting. In short, miners have little experience of preparing bankable feasibility studies. Consequently, the major methods of raising funds is through equity participation or cash loan from a mineral trader/buyer;
- **Communication:** The NMA expressed disquiet about the current state of relationships that exists between them and both the MMSD and WB PMU. Their members felt that the relationship between the operators and regulators had broken down and cited lack of response to enquiries and general rebuttal of appeals. The MA wish the MMSD to understand the difficulties inherent in developing the solid minerals sector, which is capital intensive and were seeking reassurance that local small-scale and artisanal operators are not alienated at the expense of attracting foreign direct investment. NMA felt that they should have been invited to comment on the drafting of new mining laws as professional representatives.
- **Trespass by informal operators:** Difficulties were also expressed over illegal occupation of mining leases held in title by others (squatting) which was not being adequately policed by MMSD. Formal mining operators are hampered by old regulations and lack of policing of informal artisanal mining,
- **Stagnation:** The mining sector has been neglected by the authorities for many years leading to a lack of experience, knowledge and loss of market. Geological knowledge is poor, ore reserve quantum and estimation techniques are not definitive. There has been no investment in the sector to carry out proper prospecting, therefore resource base or reserves are not known. There has been no consistency of production levels needed to show the value of minerals to outside investors.
- **Lack of technical and business knowledge and support:** Most ASM operators, association members and other stakeholders have poor knowledge about the

minerals market size, function, practice quality control measures and pricing. As a consequence they are easy prey to intermediaries higher in the market chain and are disadvantaged when trying to negotiate improved product value. There is a different market structure for different mineral market sectors. NMA consider that there is lack of opportunity to link with large-scale foreign operators;

- **Lack of investment in modern equipment:** Investment in mechanisation and equipment is much needed in ASM sector. Artisanal miners are ‘cherry picking’ known deposits, which may be ruining the resource by using inappropriate techniques e.g. blasting causing micro-fracturing in potential dimension stone quarries. NMA and ASM need exposure to a range of modern/appropriate techniques for mining, processing and dressing of minerals to improve value, health & safety, environment and efficiency. There are very few laboratory facilities available to the ASM operators (except at established Buying Centres) and hence producers are at the mercy of buyers in respect of quality and price setting
- **Export documentation slow and cumbersome:** Journey time from mining areas to port (Lagos) is lengthy (2 days duration from sites visited) and there is no guarantee that the consignment will arrive due to poor road and vehicle conditions. Application for export approval can take up to 2 months after payment of royalties which currently causes delays and contractual difficulties.
- **Introduction of new legislation:** Applications for mining lease submitted for processing by the Mining Cadastre Unit are currently held in pending until after new law enacted which is causing frustration and delay in production in the formal sector. If the introduction of mining regulations and guidelines is not completed speedily, this is considered to be another source of frustration. When no regulations were available in the past this gave latitude to the Minister to intervene or act in a discretionary way which is unacceptable and lacks transparency;
- **Seasonality:** Artisanal production tends to be seasonal and is influenced by the activity of visiting buyers. Small-scale operators also find it difficult to maintain a permanent workforce due to the conflicting demands of subsistence farming and the transient nature of mineworkers.
- **No added value retained:** This is particularly the case with the gemstone trade. Rough stones are sold, since there are no polishing or finishing facilities and expertise. As a result there is no opportunity to add or retain value to the product.

## 8.0 SUMMARY OF FINDINGS, RECOMMENDATIONS AND CONCLUSION

### 8.1 Summary of Findings

- Nigeria is a large and fairly diversified economy in terms of its resource base although, mainly mono-cultural as it currently depends mostly on crude oil exports;
- The business environment which was hitherto controlled by the government is being liberalized especially since the inception of the civilian regime in 1999;
- Though the country is endowed with many solid minerals, it cannot be classified as a mineral producer because its ranking on the major indices of contribution to exports and GDP is classified as insignificant to very low;
- The mining sector has generally been relegated to the background as the country has concentrated on the hydrocarbon sector, in spite of its large potential as a source of foreign exchange earnings, government revenue and contribution to provision of industrial raw materials, if properly managed;
- The '*resource curse*' threat is real and it can apply to the solid minerals sector just as it has to oil by which it is meant that the country may not ultimately benefit from their exploitation arising largely from its enclave nature – foreign capital, technology, personnel and low interaction (purchases of inputs) from other sectors of the economy;
- There had also been a lack of coherent policy on the sector, thereby exposing it to exploitation by poorly organised and often illegal miners. Other inadequacies include infrastructural deficiencies and poor accessibility of mining sites;
- Another finding of the study has been the inadequate funding of the sector arising from a combination of the perceived risk of investments in the sector and therefore low private sector interest in funding it; and the dominance of government which was unwilling or unable to fund it adequately;
- The policy and environment are changing both in terms of the composition of the main players as well as the projected roles in national development. For instance, there are moves to privatize the operations as well as exploit its capacity to contribute to exports and foreign exchange. There is the absence of a policy that addresses the impact of mining in the environment. Uncontrolled exploitation of the solid minerals would degrade the environment;
- The legislation pending on the National Assembly constitutes to cause a drag on the ability of the sector to take-off effectively;
- Objectives and concepts of new mining legislation provide a sound base for developing the solid minerals sector, but the new Mining Bill has still not been enacted;
- The strategy and policy expressed in NEEDS are ambitious but coherent and should permit realisation of planning targets. It is noted that there is no review data available for correlation and achievement of aims. Those provisions in the NEEDS

document that have not been executed should be carried forward to NEEDS II and implemented;

- The new structure of the MMSD should provide for better understanding and regulatory control of the sector;
- Consistency of application of those plans and legal instruments intended to control the sector is required. This continuity of action, coupled with good governance and transparency will engender confidence to attract more foreign direct investment;
- Though the Nigerian Geological Survey Agency has been granted autonomy, it appears to be a lack of resources to carry out its assignment efficiently and effectively. Geological knowledge of the resource base is low. The NGSA work programme needs to be more clearly defined, focussed and co-ordinated with MMSD aims and objectives, in order to optimise value to the country;
- The production function of the solid minerals sector poses challenges to the efficiency of the sector and the components are currently not in the best shape.
- Multiple taxations are a challenge to the development of the solid minerals sector.
- Many of the larger, international mineral operators, advisors and investors are cautious of developing operations in Nigeria (financial and geological risk can be factored into a project analysis but political risk is less easy to define);
- Pilot projects to improve ASM capacity, technical, market and economic knowledge would be a useful demonstration tool;
- The local banking sector have little knowledge or experience of appraising solid mineral project finance. Similarly operators in the ASM sector find it difficult to access finance due to poor financial awareness and control. Capacity building in cash-flow modelling, project design/analysis and risk assessment is required by both sectors;
- The economy is largely cash based and the provision of long term loan facilities, such as that required to support mining projects is rarely available;
- A better understanding of the behaviour, size, potential for growth and sensitivity of the solid mineral markets (industrial, metal, gemstone and construction) would be an advantage to MMSD. Capacity building is required;
- The current value of solid mineral production is difficult to determine, previous solid mineral statistics are unreliable due to under-reporting and illegal trading, particularly in export oriented products such as precious metals and gemstones;
- The opportunity to retain and add value to solid minerals produced in Nigeria has not been taken;
- Extension services to ASM operations would enhance and extend their operations (e.g. buying centres, gem polishing)and
- Improvements in infrastructure will undoubtedly improve access to solid minerals, but for large projects the project proponent is likely to provide such facilities if required.

## 8.2 Recommendations

There is a need to continue macroeconomic and sectoral policy dialogue to support the alignment of the reform of the solid mineral sector with the government's efforts to maintain appropriate policies. It is also necessary to establish technical and microeconomic assistance through capacity building at the institutional and operational level, in particular to the ASM co-operatives and financial sector. NEEDS provides legal protection for and improves access to minerals by ASM which can contribute to an increase in living standards, but capacity needs building in the ASM sector if deposits are to be worked efficiently, effectively and without causing waste to the resource. A focus on ASM sector capacity building is therefore essential for engaging the community and for pro-poor development in the following particular areas:

- Project planning, valuation and costing;
- Financial management and budgetary control, leading to the formulation of business plans;
- Basic geological knowledge to understand the mechanisms for control and direction of mine workings;
- Market structure, behaviour and opportunities, and
- Means of adding or capturing value within the country.

Pilot projects and demonstration programmes should be identified for targeted mineral undertakings where these would realise the greatest benefit. Criteria for assessing that benefit should be defined.

A situation analysis of the market cluster for targeted minerals will help to develop product knowledge, quality requirements, supply and demand characteristics in order to better position the sector.

Institutional capacity building in risk assessment for mining projects would be very useful for government, investment and the financial community in order that the technical, financial, political and business risks inherent in mining are fully understood. This, in turn, should be linked to providing leverage to and an expansion of financing services to the solid minerals sector.

Appropriate and transparent revenue sharing schemes and management systems should be introduced to ensure correct control and distribution of rental income deriving from solid mineral income.

Improvement in competitiveness to attract private investment and improvements in the administration of mineral rights and operations will result from the continuation of the process

of revising and modernising the legal and fiscal arrangements for mining and by strengthening good governance.

Enforcement of mineral property rights may be necessary when the process of definition of mining title in the cadastre system is advanced. It will also be important to strengthen the ability of government agencies to implement ASM development policy whilst continuing to promote an attractive socio-economic, regulatory and fiscal environment favourable to the development of the national private sector and the foreign direct investor.

### **8.3 Conclusions**

The prospects for the development of the solid minerals sector in Nigeria are good. Comparisons with other countries possessing a similar mineral endowment would indicate fine 'up-side potential' for accelerated, sustainable, pro-poor and non-oil private sector growth. The specific economic benefits that can arise are increase in solid minerals production for export and domestic consumption with considerable positive financial impact. The existing value of mineral production and hence the projected increase in value retained in the short-term is difficult to determine, since statistics are unreliable and much of the high value, easily transportable minerals leave the country unreported.

The current changes in direction from state ownership and control to private sector development should also provide for faster growth. The new regulatory framework is conducive to attracting interest in the development of the sector but requires a speedy implementation of the proposed new Mining Law (replacing the Mining Act,1999) and associated regulations. Delay in implementing the legal framework is considered to be a major limiting factor deterring international operators from investing in Nigeria's mining sector. The mining cadastre is functional and is poised to process a backlog of applications for title, however the delay in enacting the Mining Law is preventing the issue of new licences. This has the dual effect of frustrating international investors in their attempts to develop mineral exploration and extraction projects and obliges ASM operators to work without formal licences. Evidence of interest in investment in mineral projects is evidenced by the increased number of applications for registration in the mining cadastre.

A consistent and transparent application of regulations and policy is required to build faith in the security and tenure of mineral land. Long term investment decisions need to be taken for the promulgation and realisation of solid mineral exploration and extraction projects. The banks and government have a role to play in ensuring finance is made available and that incentives continue to be attractive to potential investors in the manner detailed in this report. The 'one stop shop' approach adopted by the NIPC and MMSD provides a sound basis for attracting inward investment and facilitating the permit process.

There is insufficient data currently available, in respect of the geological/resource knowledge of particular mineral deposits and the market potential, for this study to define the most attractive solid mineral prospects. The major interest is likely to be concentrated on:

- Metals (precious and base) for export; in particular gold, tantalum, columbite, lead and zinc;
- Gemstones mainly for export; and
- Industrial minerals mainly for import substitution of minerals consumed in country; in particular barite and gypsum.

Within a satisfactory investment climate there is potential to raise foreign direct investment for large scale mining projects into US\$ hundreds of millions of production value in the near term. The realisation of an increased focus towards mineral production from the ASM operators could aid poverty alleviation and increase economic development in rural areas.

Improvements in infrastructure would assist in gaining access to and transport from solid mineral project sites. This is particularly the case where large volume – low value, bulk mineral commodities are extracted.

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**APPENDIX 1**

**MISSION REPORT NOTES**

## **WORLD BANK - NIGERIA**

### **An Economic Analysis of Natural Resources Sustainability**

#### **MISSION REPORT FOR THE MINING SECTOR COMPONENT**

#### **INTRODUCTION**

John Eyre, Technical Director, Wardell Armstrong International (“WAI”) has been commissioned on a short term consultancy, by The World Bank, to assess the prospects of an industrial mining sector emerging in Nigeria as well as economic, institutional and other factors.. As part of this advice he has undertaken the following tasks prior to and during the in-country mission 13 – 25 March 2007:

- Interviews with international mining companies, financial advisors and investors;
- Brief and de-brief meetings with Project Management Unit and World Bank staff, Nigeria;
- Meetings with Nigerian Federal and State agencies, institutions and departments;
- Field visits to mining operations and discussions with operators;
- Meetings with financial services representatives;
- Literature review and research;

#### **TASK REPORT**

##### **Interviews with international mining companies, financial advisors and investors;**

Formal and informal interviews were sought with a range of stakeholders in the international mining sector to seek their opinion with regard to investment into mining projects in Nigeria. This was undertaken by WAI staff at mining promotional events (Indaba, Feb. 2007 and Promoters and Developers Association; Canada, Mar. 2007) and by meetings with selected companies and agents in London in March 2007.

The opinions expressed ranged from broadly positive general interest in solid mineral development potential to negative statements concerned with the perceived investment risk associated with mining projects in the country. The strongest positive comments were expressed by operators and banks familiar with working in the Sub-Sahara, whilst financial advisors (NOMADS) expressed the most caution. A summarised version of comments is given as follows:

- The lack of a recent successful track record of large scale mining mitigates against major investment;

- Recent promotional events are helping to spread knowledge but more geological understanding of deposits needed;
- Mining potential at depth is generally unproven;
- Main international interest is in metals (precious, base, ferrous and non-ferrous);
- If a mining project is shown to be good enough and financially sound, funds can be found;
- Reliable, well established in-country partner, preferably with mining and market knowledge is required;
- Trusted professional relationships could override concerns about in-country problems;
- Geological and financial risk can be factored into project appraisal but political risk is considered to be uncertain and consequently falls into the high risk category;
- Comparable projects in other countries may be favoured, due to perceived political instability in Nigeria;
- Encouraged that regulatory framework is being updated and should be conducive to mining investment, but the application of those legal instruments have not been tested to ensure consistency over time;
- There are perceived advantages to be had by 'first movers' which may attract small or medium sized exploration companies, promoters or speculators;
- Negative media coverage has led to concerns over corruption, violence, security, political stability and transparency;
- The country is considered to suffer from infrastructure problems with electricity supply, water supply and fuel supply being the most critical elements;
- There were no objections to investment in Nigeria *per se*.

**Brief and de-brief meetings with Project Management Unit and World Bank staff, Nigeria;**

Briefing meeting held at 10.30 on 15 March 2007 at the PMU offices at which the project staff were introduced and a work plan for the mission was discussed and agreed. Mr Linus U Adie, Head of Unit, assigned Mr Ojeka A Patrick as counterpart and Mr M. S Jibril as logistical support to the mission. This meeting was followed by a short introductory meeting with representatives from the Ministry of Solid Mineral Development (MSMD), Ministry of Finance, Ministry of Environment and Nigerian Geological Services Agency (NGSA), to explain the purpose of the mission. Full support was promised.

A de-brief was held at 12.00 on 23 March 2007 at the PMU office at which a summary of the interim findings of the mission were presented and discussed.

- Objectives and concepts of new mining legislation provide a sound base for developing the solid minerals sector, but Bill still not enacted;

- Strategy and policy expressed in NEEDS are coherent and should permit realisation of planning targets. These are ambitious and there is no review data available for correlation;
- The new structure of the MSMD should provide for better understanding and regulatory control of the sector;
- Consistency of application of these plans and legal instruments is required. This coupled with good governance and transparency will engender confidence to attract more foreign direct investment;
- Geological knowledge of the resource base is low. NGSA work programme needs to be defined, focussed and co-ordinated with MSMD to optimise value to the country;
- Many of the larger, international mineral operators, advisors and investors are cautious of developing operations in Nigeria (financial and geological risk can be factored into a project analysis but political risk is less easy to define);
- Pilot projects to improve ASM capacity, technical, market and economic knowledge would be a useful demonstration tool;
- The local banking sector have little knowledge or experience of appraising solid mineral project finance. Similarly the ASM sector find it difficult to access finance due to poor financial awareness and control. Capacity building in cashflow modelling, project design/analysis and risk assessment is required by both sectors;
- The economy is largely cash based and the provision of long term loan facilities, such as that required to support mining projects is rarely available;
- A better understanding of the behaviour, size, potential for growth and sensitivity of the solid mineral markets (industrial, metal, gemstone and construction) would be an advantage to MSMD. Capacity building is required;
- Previous solid mineral statistics are unreliable due to under-reporting and illegal trading;
- Improvements in infrastructure will undoubtedly improve access to solid minerals, but for large projects the project proponent is likely to provide such facilities if required;

Further details can be found throughout this report and will be reported on in full in the main report (see draft content headings at the end of this report).

## **Meetings with Nigerian Federal and State agencies, institutions and departments**

### ***Meeting on 14 March at NGSA Customer Service Centre with A M Tukura:***

NGSA is responsible for national geoscience data management and information services. Much of the country's geological knowledge and data collation dates back to the 1970's and in some cases much earlier. The Geological Survey of Nigeria Agency became operational in 2003, with its function being to organise and verify historic data, and to undertake some early stage simple geology in order to provide interested potential foreign investors with

enough information so they can form an educated view on the prospectivity of a region. The Customer Service Centre acts as an interface with and reception point for potential investors. It can provide copies of Geological maps showing solid geology and mineral resource maps at 1:2,000,000 and 1:1,000,000 scale (paper and electronic versions available). Several promotional documents dealing with exploration opportunities in different minerals are available from the centre. NGSA field staff are conducting studies on mineral occurrences (geochemistry, chemistry and mineralogy) and are updating geological maps. Targeted minerals are reported to be barite, bentonite, copper, gypsum, iron ore, limestone, manganese, marble, nickel, phosphates, silver, tantalite, pegmatites and gold. The choice of minerals appears to be based on customer enquiries.

Aerial geophysical surveys are underway and are due for completion by end 2007.

Copies of promotional documents were provided.

*Comment:*

A clearer strategy and focus for allocation of scarce NGSA resources should be undertaken in discussion with MSMD and other stakeholders based on economic geology (mineral deposit modelling and ore forming processes) to prioritise and consolidate its activities towards those minerals which could provide the greatest potential economic benefit to the nation. Consideration should be given to re-orientating the current regional mapping programme towards more thematic, project based data capture, interpretation and product delivery in areas having natural resource potential.

The computerisation of data, large-scale geological mapping, geochemical sampling and airborne geophysics has not yet been completed, meaning quite simply, the risk for an early stage explorer is much greater. Undertaking such work is standard procedure for countries interested in promoting their mineral potential. Foreign interest should be increased when the full suite of information is available. An effective economic geology department for solid mineral interests should be established to interpret, appraise and evaluate projects.

***Meeting on 15 March at Mining Cadastre Unit (MCU) with Prof. I. Garba, Head of Unit***

MCU are charged with the administration of all matters relating to mining titles and rights in an efficient and transparent manner. The unit was established in Nov 2005. Existing licences/leases have been revalidated where appropriate and entered in to the cadastre (electronic copy obtained). There are 290 extant licences/leases in the database as at March 2007. New registrants have been entered into the database and there are currently 2183 applications pending (of which 1365 have been received in the last 12 months); 89 refused and 18 unallocated. All pending applications are held 'in-hand' awaiting the passing of the new mining law.

All applications are dealt with on the 'first-come-first-served' principle.

An electronic copy of the cadastre database was purchased.

*Comment:*

There is an increasing trend of applications for licences/leases, in the last 5 years as shown on the database. This may indicate an increasing interest in solid mineral potential

The unit appears to be well run and has structures in place to be managed in an independent, efficient and transparent manner.

***Meeting on 15 March at Mining Inspectorate Department (MID) with Eng. Goni Sheikh, Director***

The duties of the Department are:

- General supervision of mining, quarrying and explosives;
- Ensure proper mine design and operating guidelines followed in respect of health and safety;
- Assess, prepare and render mineral returns.

*Comment:*

Mineral returns have been processed since 1997. However it was noted that old data is likely to have been underreported especially in the informal mining sector (estimate 70%), due to lack of close inspection; self submission and dishonest disclosure of volumes extracted. It is anticipated that the level of underreporting will be reduced in 07/08 and royalty income will increase accordingly. All current mining activity is artisanal or small-scale by type with a small number of illegal operations which will be addressed by the authorities following the introduction of new mining legislation.

MID expect solid mineral production to rise significantly from its existing, low base. Increase in production is anticipated in three market areas, namely locally used minerals (industrial and energy); base metals and precious metals. Production is likely to be demand led, with locally used minerals rising with GDP (+6%); base metals driven by world demand and precious metals influenced by high price and preference for 'brownfield' sites.

***Meeting on 15 March at Artisanal and Small-Scale Mining (ASM) Department with Eng Olidepyu, Head of Department***

The function of the Department, established in 2005, broadly involves the implementation of the provisions of the Minerals and mining Act and the formulation, recommendation and implementation of government programmes and policies for the support and promotion of

ASM. Policy development involves the formalisation of the informal mining sector, encouraging co-operatives, receiving applications for registration, helping to empower by facilitation of external services and finance. Sub-offices are based in 14 states, covering all geopolitical zones in the country.

Market analysis has only been undertaken for barite and gypsum, as part of the intended pilot projects (currently suspended). The establishment of Buying Centres are being encouraged. This should add to knowledge of market behaviour and improve the market chain process.

*Comment:*

Access to finance is identified as a major block to development, particularly in the ASM sector. Nigerian banks have little knowledge of how to appraise mining projects, a cash culture and shortage of 'long funds' exacerbate the situation.

Knowledge of financial risk assessment, economic analysis, project finance, market function and activity is weak and capacity building is required for the department and ASM operators.

***Meeting at National Planning Commission***

- *16 March Macroeconomics Department National Planning Commission with Samuel Eloho and Mohammed Auwal;*
- *16 and 22 March Head of Mineral Resources, Aso Pat Vakporaye.*

The NEEDS document (2003 – 2007) sets out government policy, strategy, targets and instruments for the plan period. The document was developed by NPC and published in 2004. NEEDS 2 is in the course of preparation. It is noted that a 10% annual growth in solid mineral production is predicted as a result of reforms in the sector. Potential demand is also considered to be high. Infrastructure is seen as a driver for mineral activity and the current state of such facilities causes low production.

NPC had sectoral units until 1993, when the structure was abandoned. As a result there is very little solid minerals expertise with the Commission.

Investment in electricity power supply agreed for 6 new power plants during the current plan period. Government target 10,000MW by end 2007, rising to 20,000MW by end 2008 if government approval given for 6 more plants. Anticipating significant rise in village 'hook-ups'.

Contract signed between Chinese Co and government to replace rail track, introduce new rolling stock and update trains in a staged development programme to improve infrastructure.

Solid mineral production in Nigeria only forms a small fraction of the overall GDP and is overshadowed by oil and gas revenues, but anticipated to grow during NEEDS 2 period.

No written terms of reference for Mineral Resources Unit, but general policy thrust is towards improving the informal mining sector, attracting inward investment and import substitution. Movement away from government sponsored development of the sector towards private investment in solid minerals.

Nigerian steel industry not producing at present, all steel products are imported but demand should encourage investment.

Examination of holistic link between solid mineral development, energy supply and clean development initiatives required.

*Comment:*

NEEDS sets out the policy thrust of the government and provides comprehensive strategies and measures specific to the sector. NEEDS supports exploration and exploitation of solid minerals to generate employment, provide input to local industries and exports for base metals and gemstones.

NEEDS has been reviewed in 2007, but since the results have not been made public it is difficult to assess achievement of aims and results.

***Meeting on 16 March at National Bureau of Statistics with Leo Sanni***

The NBS is the repository of official statistics and an electronic copy of the Annual Abstract of Statistics 2006 was obtained.

*Comment:*

Solid mineral production is known to have been underreported in the past.

***Meeting on 16 March at Central Bank of Nigeria***

A microfinance policy was launched in 2006 to establish Microfinance Banks to help those in poverty line. It is intended that Community Banks will convert to Microfinance Banks able to advance funds to max. 500,000 Niara, with repayment assessed on the basis of predicted cash-flow expectations with savings forming collateral. Nine banks have been approved and licensed with a further 14 approved in principle and 40 pending. It is intended that most of the 500 Community Banks will convert over time. Microfinance Banks will be free to set their own rates but the ultimate aim is to provide a competitive market.

Bank members would work with any group wishing to take advantage of the funding route, to share ideas, strengthen the group, help to manage funds and provide cohesion. This could be achieved by holding regular meetings and formulation of a business plan.

Annual report and statement of accounts 2005 and first half 2006 was supplied.

*Comment:*

Due to the restrictions on maximum funding level, microfinance arrangements may be particularly useful to artisanal miners and ASM co-operatives. Knowledge and experience of cash-flow forecasting by operators may present a problem to accessing funds. The ASM department of the MSMD could act as honest broker to sensitize operators to the scheme and provide capacity building measures.

The banking system has been acting largely as cash holding accounts and the move towards provision of long-term loans will be required if capital intensive mining operations are to be adequately resourced.

***Meeting on 22 March at Nigerian Export Promotion Council (NEPC) with M. Olajide Ibrahim, Deputy General Manager***

Export procedures for solid minerals treated the same as any other commodity. There are thought to be no reliable statistics of solid mineral exports in the past. The quality of shipping documents is reported to have improved since the introduction of Clean Certificates of Inspection (CCI), however there is still assumed to be a high level of 'informal' exporting as indicated in ITC bilateral statistics.

Export incentives:

- Export Expansion Grant – to stimulate non-oil exports. Credit certificates can be issued, to successful applicants, to offset import/excise duties. The grant is company specific but solid minerals is likely to fall in the 10% incentive rate band, or;
- Manufacturers Export In-bond Scheme – allows duty free import of raw materials if the final purpose is conversion to export.

*Comment:*

There are not thought to be any solid mineral exporters taking advantage of either of the incentive schemes. This is probably due in part, to low trading volumes, the high level of certification required and the administrative burden of documentation.

***Meeting on 22 March at Nigerian Investment Promotion Council (NIPC) with Mohammed Bada, Amos Y.Sakaba and Edet E Archibong***

Since 2006 the NIPC now provide a 'one-stop-investment-centre' to facilitate foreign direct investment (FDI), in place of the previous multi-agency function. Investor registration, processing and approval is speedy and NIPC has seen a 75% rate of growth in 15 months. The MSMD have a solid minerals desk at the centre which has serviced approx 100 FDI enquiries in 2006 and +20 in Q1 2007, drawn mainly from India, China, Thailand and Canada. A broad interest in minerals is expressed, but the greatest interest appears to be in tar sands and gold with a lesser interest in gemstones, tantalite, limestone, coal and dimension stone. FDI's are referred to NGSA and Mining Cadastre Office for further information and registration of licence/title where appropriate.

*Comment:*

Stated investment incentives for solid minerals are attractive;

- 3 to 5 years tax holiday;
- Low corporate tax of 20 – 30%;
- Deferred royalty payments depending on magnitude of the investment and strategic nature of project;
- Capitalization of exploration costs;
- Extension of infrastructure to sites;
- Capital allowance
- 5% investment allowance;
- Exemption from customs and import duties on agreed mining equipment;
- Roll-over relief on capital gains tax for replacement of plant and machinery;
- Repatriation of profit and dividends.

Tracking conversion of interest expressed by potential investors into mining operations is not practiced hence it is difficult to quantify the success of the centre in attracting FDI.

***Meeting on 23 March at NGSA with O. Egewu, Director, Regional Geology***

All solid mineral operations in the country are literally scratching the surface. The majority of geologists are drawn into the oil industry as a result there has been very little exposure to field work for solid minerals. NGSA consider that there is a good background knowledge of the basic geology of the country, but mapping programmes will progress at 1:50,000 scale which may be more useful to mineral prospectors.

*Comment:*

There is some knowledge of resource assessment of minerals for domestic consumption and pockets of work have been undertaken for barite, gypsum, gold and pegmatites. There is a need to improve knowledge within NGSA, beyond the basics, for mineral economics and market requirements including quality and specification. Focus and vision is required for the solid minerals programme.

## **Field visit to Azara, Nasarawa and Jos, Plateau State 19 – 21 March**

The following sites were visited:

### ***Mines Inspectorate Dept., Lafia, Nasarawa with Eng. D A Awojibi***

Introduction to operations in Nasarawa. 3 barite mines in operation (+ 3 hoping to set up); 1 tantalite, 3 river gravel extraction sites licenced; approximately 10 informal gemstone workings thought to be open and 60 – 100 ASM operations. Suspension placed on barite pilot project, but no clear reasons given for decision. Buying Centres planned for Barite at Lafia; gemstone at Ogoja, gypsum at Nafada and Ifikla. Milling operations suspended. There are currently no laboratory facilities and hence producers are at the mercy of the buyers for quality and price band. Proposed to incorporate lab analysis and marketing function at buying centres.

### ***Azara Barite vein workings (#1 and 17) - ASM operations***

- Barite Dealer Association Society 30 members – Some Mine and some buyers. Dealers sponsor miners.
- Handbreaking along and down vein 3.4m wide, 20m deep up to 1km strike length. 50 miners working sections on open vein with collective workforce of +1000. Vein ore hand hauled by bucket to the surface stockpile. Head panned to stock close to road. Sorted on site from stockpile, washed and stockpiled close to road. Production reported as 50 trucks per month @ Vein 17 = 2,000t/m. Fe main impurity at vein 17 say 5% of official product. Product size varies 200mm to 100mm and 50mm to dust.
- Eng. Tasioma – Head of Co-operative Vein 1 . 2 co-operatives (Barite Miners Consortium), 200 labourers / miners and processing stockpiles sorted/washed and dry sieved. Sold to Oil Servicing Co – via vendor. N450,000 to 500,000 cash advance to miner in bank before collection. Separate price for loading N20-25k/truck 40t truck. Production capacity given truck available say 20-30 trucks/month say 200-300/yr. No stripping equipment – had drilled, some blasting, benched and shifted. Could up production 50t/month with stripping. Max depth reached 30m – could reach 50m max depth limit with available technology.
- Production higher in dry season. Need to apply for funding for pump in wet season for dewatering – may bring bulldozer on site for contract overburden removal.
- Eventual buyer pays cash to Dealer when delivered no knowledge of the quality – Buyer has monopoly – will do own quality control. Buyer: Oil Chem / System Milling / Delta Prospector/ Beriot / Haliburton/ Marcoba (MI) Labs. (Typical prices for S.G. 4.2 = N82,000 or S.G. 4.0 = N28,000/t at Potakit or N17,000 at Lafia. Product loaded in 40t trucks – Bought at N450,000. Costs: transport N220,000 to Potakit, loading N40,000 / truck, parking and treatment N40,000. Dealers always given cash

advance, cannot take internal to another Co. (Advance = cost of transport or to provide a truck i.e. N220,000).

- Miners Association registered with the Ministry. A/Cs held as Co-operative – close link with ASM officer in Lafia. Dealers Association extends to Vein 17 and 1.

***Spectrum Minerals Ltd. Buying Centre, Jos, Plateau State with Tony Adzah, MD***

Established to accept and generate market for ASM production. Trades mainly in colombite, tantalite, tin and wolfram cash on delivery paid based on XRF and lab analysis. Average monthly throughput Col 20t; Tant 5t; Sn 30t; Wo 20t. from Spectrum to Chinese end-user. Estimated monthly total from region say: Col 45t; tant 10T; Sn 130t; Wo 60t. End-user/exporter provides funds then charge service and shipment fee to derive purchase price for producer. Beneficiation plant (crusher, magnetic separator and floatation) provided free to ASM producer for improvement of product if required. Spectrum Minerals Ltd has no direct control of production, which tends to be seasonal and is influenced by the activity of visiting buyers. The company are considering mining lease acquisition but are cash starved and access to capital is difficult (interest rate very high (+20%) and short payback period (-2yrs) demanded). Tin and tantalum production low at time of visit due to return of labourers to fields, prior to first rains. Journey to port (Lagos) is 2 days duration and no guarantee that it will arrive due to poor road and vehicle conditions. Application for export approval can take up to 2 months after payment of royalties which currently causes delays and contractual difficulties. Consideration to be given to improving export clearance documents and ministerial returns on fixed royalty rate.

***Mining Technologies Co. Ltd., Rayfield (Colombite) Project, Jos with Dr Joshua Egbabwe***

Artisanal and small-scale mining operations.

***Hahaibs (Nig) Ltd, Mining Company, Jos with Hauwa A Ibrahim, MD.***

Miner (3 operations – tourmaline topaz, aquamarine and smokey quartz) and dealer in gemstones. Member of Gemstones association. Reports topaz mined close to surface (1.2m depth), no blasting required but between 30 – 60 % rejects. Simple process of dig, wash and sieve. Some aquamarine also found on site (ratio 1:200 aquamarine to topaz). Sapphire resources known to exist but not worked. All mining operations undertaken at or close to surface. Technical support needed. Poorly controlled blasting of hard rock is ruining deposits. Need mechanisation, equipment, technical advice and support for rock breaking. Approximately 7 gemstone operations currently in production, centered around Basso. Some illegal operations also known to be taking place. Difficulties expressed by title holders in maintaining control of mining operations from illegal operators.

### ***Gemstone Buying Operation, Jos, anonymous***

Rough gemstones traded. No polishing or finishing done in country, hence no value added or retained. Sapphire and tourmaline being traded at time of visit. Delivered prices: sapphire 400,000 Niara/kg tourmaline 4,000 Niara/kg. Customers in Brazil and Thailand. Opinion on estimated size of undetected sales approx. \$500,000/month and under reporting of stones to lower grade of product

### ***Canes Mining Company, Gwantu, Kaduna State with Rufus Onyekpo***

ASM emerald operation. 50 labourers on site. Water pump employed and jackhammer used to prepare work site and in-pit benching. Several (7) working areas adjacent within Mining field all prepared by stripping overburden and soils over 300m x 200m. Say 6 pits to work sunk to expose pegmatites. Blue tinged emeralds extracted. Site recommended for pilot project. Wet conditions groundwater approx 10m from original ground level. Geological mapping and resource knowledge poor, mine design empirical by following pegmatite intrusion into Basalt. No mapping, 'bonanza' production when cavities reached. Consider ground probing radar for void detection as part of pilot project. Indicators of amethyst, aquamarine to emerald (light blue/green).

### ***Miners Association of Nigeria, Jos***

A meeting was held on 20 March 2007 at the National Headquarters of the Miners Association in Jos, Plateau State, between the Executive Committee of the Association, representatives of the Ministry of Solid Mineral Development, World Bank PMU staff and the author of this report. The Miners Association (MA) expressed disquiet about the current state of relationships with the MSMD and WB PMU. In particular that their members felt that the relationship between the operators and regulators had broken down and cited lack of response to enquiries and rebuffal of appeals. They were now looking at better ways of dealing with other Ministries and expressed great misgivings about a reported \$120M being made available for infrastructure development and ASM sector. The MA wish the MSMD to understand the difficulties inherent in developing the solid minerals sector, which is capital intensive and were seeking reassurance that local small-scale and artisanal operators are not alienated at the expense of attracting foreign direct investment.

It was agreed that there was a communication gap and that round table discussion is a two way process. MSMD had been undertaking a number of initiatives on behalf of the sector and examples were given (aerial geophysics; establishment of mining cadastre and inspectorate; NGSA geological mapping; SM promotion) need accurate returns now in new focus. A request was then made for the Ministry to recognise NMA as a National representative body with appropriate special interest groups and discrete geographic interest.

Half of the problem faced by NMA members is access to funding and borrowing rates. The repayment rate for short term loans is 15-40%. A short term loan is not considered

appropriate for mining which have longer pay-back periods (can IFC assist?) Country Manager. The major method of raising funds is through equity participation. At present a mining lease as not recognised as collateral.

Difficulties were also expressed over illegal occupation of mining leases held in title by others (squatting) which was not being adequately policed by MSMD.

NMA were keen to investigate harmonious investment with foreign investor as collaborative ventures. Need a proper relationship between the Association of Ministries. Move to zonal basis for regulators good but no contracts have been issued since the announcement.

NMA should have been invited to comment on the drafting of new laws.

- Want ministry to relate with Miners Association as professional representatives.
- Different market structure for different mineral sectors
- Export documentation slow and cumbersome.
- Lack of knowledge in the Ministry about market function.
- Links Jos to rest of the country
- Problem of local finance – local banks scared of mining risk – can we bring in foreign bank investment:
  - Knowledge gap in Nigerian Banks relating to mining sector;
  - Miners have little experience of preparing bankable feasibility studies – large capacity for development, poor knowledge of economics, poorly trained
  - Request to organise workshops on how to manage mining operations
- Ore reserve quantum and estimation techniques not definitive
- Investment in mechanisation and equipment needed by members, with emphasis on gradual improvement side by side with ASM continuity. Artisanal miners are cherry picking deposits, now need to look at improving operations towards small scale operations and techniques. Only one or two mechanised operations in Nigeria.
- Identify professional mining operations and develop these as case studies and test sites.
- Need link up with foreign developments and operators.
- More interaction between operators and negotiators (technical workshops and seminars to share experiences)
- Ministry need to concur on relationship with Mining Association as they don't understand the problems within mines.
- Every miner in Jos belongs to the Mining Association.
- Exchange of data difficult due to lack of statistics
- No finance to do proper prospecting, therefore resource base or reserves not known

- How does an FDI deal with Association – can they directly deal with the operator? How does W.B. deal with a mining company – One approach (IFC) considered that W.B. will not fund an individual project, only a strategic development.
- Consistency of production levels needed to show the value of minerals to out – investors.
- New Mining Act being passed, but not yet fully implemented.
- ASM department has been set up to encourage and promote the sector.
- Buying Centres needed to retain and add value to products and provide central expertise;
- ASM approach as friend and development capacity;
- Develop relationship with small-scale miners;
- Regulations and guidelines to follow Mining Act;
- MSMD explained operation of cadastre and mining lease system. Example of mining lease submitted for processing – held in pending until after new law enacted and will be granted subject to Community Development agreement, compensation, EIA and work plan accepted. Question of squatting should be resolved as part of community agreement.
- The mining area is 100 years old, why has the Ministry left alone until now to address this issue of developing the sector?
- Legal mining operators are hampered by old regulations and lack of policing of informal artisanal mining, what will MSMD do about it?
- How will mining cadastre sort out overlapping applications for title?
- Expect Ministry to respond to correspondence; (10 years no response in many cases)
- If Ministry set up as regulators, let it act as such , don't dodge responsibility
- To attract an investor, authenticity of title and establishment of ore reserves is considered to be essential. Only defined reserves are in base metal mines set up by former colonial operators (1960's). Continuation of ASM leads to lack of demonstration of larger scale mining due to lack of policing and control.
- Since 2003, when W.B. loan of \$120m was made available, why has the Mining Association not benefited? No response to correspondence since 2003 to the Mining Association.
- When no regulations were available this will give latitude to the Minister to intervene or act in a discretionary way. Need immediate introduction of regulations and guidelines.
- Who should be the Minister? Respect the needs of profession and appoint a Minister with a knowledge of the industry e.g. a professional mining engineer.
- How does W.B. relate to the Mining Association? Go through the Government Industry wants a conducive atmosphere at the Ministry – should be through primary contact with the Mining Association – to trust ability of miners to put their own house in order.

- Decade and a half of the neglect of the sector has impacted hard on mining and members of the association. Fear from association of being ignored / no response. NMA now need to see progress.