



# Challenges of Artisanal And Small-scale Mining Sector In Nigeria and the role of Nigerian Geological Survey Agency

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On ASM In Ghana

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# INTRODUCTION



- **Artisanal and Small-Scale Mining (ASM) are formal or informal operations with predominantly simplified forms of exploration, extraction, processing and transportation.**
- **ASM is normally low capital intensive and uses high labour intensive technology.**
- **ASM include men and women working on an individual basis as well as those working in family groups, in partnership or as members of cooperatives or other types of legal associations and enterprises involving hundreds or thousands of miners.**



# INTRODUCTION (*CONT'D*)



## DEFINITION OF TERMS

### 1. Artisanal & Small-scale Mining:

- Our Country definition of ASM is based on size of concession and the level of technology and it distinguishes between “Artisanal” and “Small-scale” Mining
- According to Nigerian Minerals & Mining Act, 2007.
  - **Artisanal Mining** is limited to utilization of non-mechanized methods of reconnaissance, exploration, extraction and processing of mineral resources within a **Small-scale Mining Lease Area**.
  - **Small-scale Mining** is that involving low level of technology or application of methods not requiring substantial expenditure for the **Conduct of Mining Operations Within Small-Scale Lease Areas**.



# INTRODUCTION (*CONT'D*)



## 2. Mining Cooperative

**Group of artisanal miners, of not less than 20, mutually agreed to work together to pool and harness their resources for the purpose of mining and registered as a cooperative under relevant Federal or State laws as Mining Cooperatives (NMMA, 2007).**



# INTRODUCTION (CONT'D)



- **Background: Artisanal and small-scale mining (ASM) is the oldest form of mining in NIGERIA**
- **Reasons for the Decline of the Mining Industry in Nigeria:**
- **The indigenization policy of late 1970s ostracized foreign investors operating the commercial tin mining companies on Jos Plateau,**
- **Collapse of commodity prices in the mid-1980s**
- **Disengaged mine workers naturally became the nucleus of the enlarged “migratory” band of informal miners, operating since 1980s,**
- **“Oil Boom”**
- **ASM dominates the Nigerian mining space in recent time.**
- **Their operations currently produce the bulk of Nigeria’s minerals output (about 90%)**
- **ASM generates rural livelihoods and potential for poverty alleviation.**



# **NIGERIA'S MINING SECTOR REFORM**



## **BACKGROUND OF MINING ACTIVITIES**

**Prevalent Issues Prior to Nigeria's Mining Sector Reform (Pre-2005):**

- **Inadequate Geological Information & Data.**
- **Opaque and Inefficient Licensing Procedures Leading to speculative title holding.**
- **Uncontrolled Artisanal and small-scale mining operations.**
- **Prevalence of Illegal Mining Activities.**
- **Jurisdictional Conflicts between Federal and State Governments.**



# OUTCOMES OF THE MINERAL SECTOR REFORM



- **Reorientation of Government from ‘Owner-Operator’ to ‘Administrator-Regulator’.**
- **Divestment of Government from mining operations.**
- **Private Sector as engine of Growth.**
- **Liberal & Transparent Access to Mining Titles.(first come first served)**
- **Guaranteed Security of Tenure of Mining Titles.**
- **Competitive Fiscal Incentives.**
- **Strengthening Geological Data Generation.**
- **Institutional and Human Capacity building.**





# OUTCOMES OF THE MINERAL SECTOR REFORM



- **Nigerian Minerals and Mining Act, 2007:** Enacted based on international best practices
- **Institutional Repositioning:** through creation of technical departments and agencies:
- The new state-of-the-art mining cadastre office
- The Nigerian Geological Survey Agency
- The Mining Inspectorate Department
- The Mines Environmental Compliance Department
- The Artisanal and Small-scale Mining Department
- The Nigeria Institute of Mining and Geosciences.



# ASM: WHAT IT STANDS FOR



- **ASM is a livelihood strategy adopted primarily in rural areas.**
- **ASM is a production system that allows local people to earn cash income.**
- **It provides an accessible livelihood for poor and marginalized people**
- **It complements other livelihood activities, such as agriculture, animal husbandry and hunting**
- **In Nigeria, an estimated 500,000 individuals are directly engaged whilst over 1.2 million are indirectly engaged in ASM operations.**
- **Serves as a support operation in times of environmental or economic stress**



# ASM: WHAT IT STANDS FOR



- **When not formalized and organized:**
- **ASM can be viewed negatively by governments, environmentalists, etc; because of its potential for environmental damage, social disruption and conflicts.**
- **However, when properly formalized:**
- **Governments and donor agencies like the World Bank believe that ASM can contribute to socioeconomic development in poor and rural areas**
- **ASM is a means of job and wealth creation**



# ASM in Nigeria



- **ASM is recognized by law and therefore regulated by government through the ASM Department in the Ministry of Mines and Steel Development.**
- **The Nigerian Minerals and Mining Act 2007 provides legal standing for ASM activities in Nigeria**
- **Under the Mining Act 2007; individuals, mining cooperatives and quarry associations could obtain licence to conduct mining under a small-scale mining lease area,**
- **These mining artisans who on their individual capacities could not acquire the necessary mining licence/lease are formalized into mining cooperatives and quarry associations.**
- **About 1,380 cooperatives applications received**
- **618 mining cooperatives/associations dealing with different classes of minerals have been registered and certified.**
- **Mining artisans operating outside the government regulatory framework (without valid mining licence/title or lease) are referred to as illegal miners.**



# ASM in Nigeria (cont'd): Supports



**A: World Bank Projects in Nigeria include:**

**1) Sustainable Management of Mineral Resources Project (SMMRP): (About 127 Million Dollars)**

- Aided formalization of ASM into cooperatives and establishment of Mineral Buying Centres
- Aids provision of grants and extension services to ASM cooperatives

**2) Mineral sector support for economic diversification project (MINDIVER): (about 150 Million Dollars)**

- Aids provision of grants and extension services to ASM cooperatives
- And proposed establishment of Mineral Resources Centres: for value addition/ beneficiation of the mineral products

**B: BOI 5Billion Naira credit facility with low interest rate**

**C: Solid Mineral Development Fund (About 30billion Naira)- intervention fund from Federal Government**



# Key Functions of the ASM Department



- **ASM Department created under ministry of mines and steel Development with the statutory responsibility**
- **for the coordination, and Formalization of informal miners in the country.**
- **Provision of Extension Services to performing Mining Cooperatives and quarry associations on exploration, exploitation, mineral processing, entrepreneurial training, environmental management, health and safety issues etc,**
- **Registration/licensing and administration of Mining Cooperatives and Mineral Buying Centres**



# ASM Products in Nigeria



- **Precious Minerals/Gems:** Gold and variety of gemstones such As Sapphire, Emerald, Tourmaline, Aquamarine, Garnet, Topaz, Zircon, Amethyst Citrine, Smoky Quartz, etc.
- **Metallic Minerals:** Cassiterite, Columbite/Tantalite (Coltan), ilmenite, Lead/Zinc Ore.
- **Non Metallic Minerals:** gypsum, baryte, silica sand, bentonite, dolomite, limestone, kaolin, aggregates, gravels and zircon sand.



# ASM IN NIGERIA : CHALLENGES

These encompass the social, environmental, economic as well as legal aspects in policy formulation:

- Poverty driven.



***FIGURE: A typical mining site at Komu, Oyo state, South West Nigeria.***



- Minimal level or lack of mechanization/great amount of physically demanding work
- Unskilled personnel at all levels of operation (both technical and management)





- Inefficient mining and processing techniques (low recovery of values)
- Low level production:



**FIGURE : ACTIVE ALLUVIAL TIN MINING IN ARIKPA, NASARAWA-EGGON, CENTRAL NIGERIA. THE ARTISANAL MINERS SEEN DIGGING AND PANNING FOR THE TIN ORE**



**FIGURE: PANINIG AND SLUICING FOR GOLD RECOVERY BY LOCAL MINERS**



# ASM IN NIGERIA : CHALLENGES (CONT'D)



**Lack of relevant geo-scientific knowledge and skills, such as:**

- **Estimation of mineral reserve**
- **The structural orientation of the mineral /ore deposits**
- **The grade of the ore deposits;**
- **Spatial orientation of the mineral deposits**
- **Engineering properties of rocks**



- Low level consideration for occupational Health and Safety issues.



FIGURE: OPEN PIT DUE TO ARTISANAL MINING OF BERYL (AQUAMARINE AND EMERALD) IN NASARAWA EGGON AREA OF NASARAWA STATE IN CENTRAL NIGERIA



FIGURE: DANGEROUS PITTING BY ARTISANAL MINERS. THE HANGING WALL MAY COLLAPSE ON THEM



# ASM IN NIGERIA : CHALLENGES (CONT'D)



## Occupational health and safety challenges

- **exposure to dust (silicosis);**
- **exposure to mercury, lead and other chemicals;**
- **effects of noise and vibration;**
- **effects of poor ventilation (heat, humidity, lack of oxygen); and**
- **effects of over-exertion, inadequate work space and inappropriate equipment.**



Little or no regards for the environment



FIGURE: INDISCRIMINATE PITTING FOR BERYL IN KOMU AREA BY LOCAL MINERS



FIGURE: ACTIVE ALLUVIAL TIN MINING IN ARIKPA, NASARAWA-EGGON, CENTRAL NIGERIA. THE LOCAL MINERS SEEN DIGGING AND PANNING FOR THE TIN ORE



# ASM IN NIGERIA : CHALLENGES(CONT'D)



## Environmental challenges includes:

- erosion damage and deforestation;
- landscape destruction;
- mercury, lead, cyanide pollution;
- direct dumping of tailings and effluents into rivers;
- improper constructed tailings dams;
- improper closure;
- river damage in alluvial areas;
- river siltation;
- garbage and solid waste;



## Unskilled/local methods of operation



FIGURE : LOCAL MINING OF BRINES IN OBI AREA OF NASARAWA STATE-NIGERIA WITH TEMPORARY SHELTERS BY LOCAL MINERS.



FIGURE: LOCAL MINING OF BRINES IN KEANA-NIGERIA



**Social Vices: Women (prostitution, spread of HIV/AIDS, STD and conflicts)**

**Illicit use of drugs**

**Child labour**



FIGURE 5: WOMEN ACTIVELY INVOLVED IN LOCAL MINING OF TIN ORE IN KOKONA-  
NASARAWA STATE-NIGERIA



Figure : ACTIVE ALLUVIAL TIN MINING IN ARIKPA, NASARAWA-  
EGGON,CENTRAL NIGERIA.( **CHILDREN MINERS SEEN DIGGING AND  
PANNING FOR THE TIN ORE**)



# ASM IN NIGERIA : CHALLENGES (CONT'D)



- Chronic lack of working and investment capital.
- Lack of financial support from banks and other financial institution.
- Lack of value addition to minerals products
- Lack of access to market (Haphazard sale of mineral product)
- Low level of income
- Seasonality; periodical operation by local peasants or according to the market price development
- Operating without legal mining titles
- Loss of Revenue to Government
- Smuggling of Mineral Products
- National security risk-(illegal migration of foreigners from one site to another)



# **NIGERIAN GEOLOGICAL SURVEY AGENCY (NGSA)**



**Nigerian Geological Survey was established in 1919 following the disbandment of the Mineral Surveys of Northern & Southern Nigeria**

- **Main objective was the reconnaissance of mineral resources rather than time consuming geological mapping**
- **Today NGSA was Established in 2003 by FEC to replace Geological Survey Department**
- **Ratified by NASS 2005**
- **Primary objective - to invigorate the Solid Minerals sector**



# Nigerian Geological Survey Agency: *OUR MANDATE*



- Acquisition, management & delivery of geological data & information on the national territory
- Natural resources related to subsurface energy, including geothermal energy; minerals, water, underground space
- Geohazards - earthquakes, poisonous gases, mass movements, land subsidence monitoring and the mitigation of their impact
- Environmental management issues including waste management





# Nigerian Geological Survey Agency: *OUR MANDATE*



- Producing geosciences information for the development of a viable mining industry and for poverty alleviation;
- Carrying out basic geo-scientific research to advance the knowledge of geology and the mineral deposits in Nigeria and elsewhere;
- Producing geological data that encourages sound environmental management;
- Serving as the national depository of all geo-scientific information relating to the earth, the marine and geomagnetic space



# NGSA: WHAT WE DO



- Regional geology mapping
- Airborne geophysical survey
- Mineral exploration
- Regional geochemical mapping
- Sedimentary basin studies
- Hydro & environmental geology
- Engineering geology studies
- Geophysical ground follow-up surveys
- Marine/coastal & geohazards monitoring,
- Consultancy, etc.



# NGSA: ROLES IN ASM IN NIGERIA



- Major impediment to the success of ASM operators in Nigeria is lack of knowledge about the geologic environment under which they operate
- NGSA Contributed to the development and growth of ASM especially, in the area of advocacy and technical support
- NGSA support services to the ASM amongst others include;
- the training of local miners on simple operational techniques involved in mining business such as:
- the basic mineral exploration,
- geological mapping,
- mining and processing methods
- marketing of their minerals
- Mineral Clinics (once in a month)



# NGSA: ROLES IN ASM IN NIGERIA (CONT'D)



- **NGSA synergize with the ASM department to provide simplified geologic information on minerals deposits through the extension service programme such as production of pamphlets on mineral commodity to mining cooperatives**
- **Nigerian Geological Survey Agency play a vital role in sensitizing the mining community on the need to adhere strictly to the best practices in management of mines tailings/waste to safeguard the environments of harmful toxics.**
- **From time to time we advise the ministry on best policy to advance the course of ASM Nigeria**





# NGSA GOT ROLES TO PLAY



## DATA GATHERING AND ANALYSIS

- **Complete and secure the release of all geosciences data projects in Nigeria**
- **Expand coverage and resolution of geosciences data in Nigeria to further stimulate an adequate level of mineral exploration discovery**
- **Accelerate the production of 1:100,000 and 1:50,000 maps of Nigeria**
- **Ensure demarcation of environmentally sensitive parts of the country e.g wetlands that are off-limits to mining should be captured on maps**



# NGSA GOT ROLES TO PLAY



- **Upgrade existing National Geosciences Research Laboratories to conduct analysis and provide accredited services in terms of mineral ore assaying, ore reserve evaluation, etc. to the ASM operators**
- **NGSA could consider conducting further geologic mapping exercises on known ASM areas on the scale of 1:5,000 or 1:10,000.**
- **NGSA could consider producing easy to read and understand, geologic literatures and maps for the consumption of laymen operating in the ASM sector.**



# NGSA: GOT ROLES TO PLAY (CONT'D)



## **DATA DISSEMINATION AND ARCHIVING**

- **Package existing data by state, mineral type and other relevant parameters, and make it available via electronic means to every government, private investors and stakeholders**
- **Expand the channel for accessing public geoscience data**
- **Establish national reporting standards, in line with the global best practices**



# NGSA GOT ROLES TO PLAY (CONT'D)



- **NGSA and ASM Department could, in the spirit of the formalization policy of the Ministry,**
- **harmonize their public enlightenment activities to include specialized symposia for registered and performing ASM operators to draw other artisanal miners into buying into the formalization policy.**
- **NGSA in collaboration with the ASM department, providing effective extension services to ASM operators. Through basic training on geologic mapping, GIS applications, environmental geology, amongst others.**
- **NGSA, ASM department and Mines Environmental Compliance Department could collaborate to provide environmental auditing and monitoring of ASM areas through routine soil, water and air quality testing.**
- **One of the statutory functions of the Ministry is to facilitate the conduct of EIA for registered and ASM cooperatives. NGSA could provide requisite information to produce an EIA especially for ASM operators working in cluster.**



# ASM IN NIGERIA: Ways Forward?



- 1) Demarcate Areas for Licensed Artisanal Small-Scale Mining  
(should be priority from the beginning)**
- 2) Microcredit – Family Empowerment,  
(facilitating equipment acquisition, Poverty alleviation)**
- 3) Enhance Education: Key to Eradicating Child Labour, Access to  
better techniques**
  - Better educational facilities**



# ASM IN NIGERIA: Ways Forward?



- 4) Environmental legislation, monitoring and enforcement.**
- 5) International community can support Nigeria in order to support the livelihoods of communities engaged in ASM**
- 6) Support for Agriculture Cash Crops: to discourage illegal mining**
- 7) Needs for international training and capacity-building support to develop ASM Sector in Nigeria**



**Thank you for your attention.**