

# Evaluation of Stakeholders' Roles in the Management of Artisanal and Small-Scale Gold Mining in Anka, Zamfara State, Nigeria

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## Abstract

This paper evaluates the roles of stakeholders in the management of Artisanal and Small-scale Gold Mining (ASGM) in Anka, a typical ASGM town in Zamfara State, North-western Nigeria, dominated by sporadic and mostly unlicensed ASGM activities. Conceptual, SWOT, PESTLE, MOTAP and SELOP analyses were used to evaluate stakeholders' roles in the management of ASGM in the area. From the evaluation, weak legislation, poor policy implementation, stringent licencing procedures, centralised government functions and poor government attention were identified to be the major factors militating against the effective functioning of ASGM regulators. Lack of management skills by the ASGM operators in the area was identified as a major barrier to their economic prosperity. Child labour, poor environmental management and cultural practices contribute to the environmental, health and safety hazards ravaging the sporadic ASGM activities by the local miners. Community leaders are thus left to grapple with the control of ASGM activities in their domain. Relief agencies and international organisations were identified as the main anchors of intervention programmes, the success of which is linked to the support and cooperation of the community leaders. Decentralisation of government functions on ASGM and organisation of miners into cooperative groups and their full integration into the formal licenced mining sector are recommended for sustainable, effective and efficient ASGM in Anka.

**Keywords:** Artisanal and small-scale gold mining, Management functions, Environmental degradation, Rural development, Regulators, Stakeholders, Community leaders.

## 1. Introduction

Artisanal and Small-scale Gold Mining (ASGM) in Nigeria involves informal and labour-intensive gold mining activities with limited capital, involving unskilled workforce of ten or more persons using rudimentary tools and techniques to extract small-sized gold deposits with low production level. While artisanal gold mining is purely manual, small-scale gold mining can be manual, semi-mechanised or mechanised (Azubike, 2011).

ASGM activities come in different forms across the world but share many similar characteristics. Unlike large scale gold mining which is planned and centrally coordinated, ASGM is self-organising and haphazardly carried out. While the former is driven by profit maximisation, the latter is embarked upon to earn a living (Anon, 2011); hence, large scale gold mining entities are easily distinguishable from ASGM. Studies by Anon. (2011); Azubike (2011); Telmer (2011); Mireku-Gyimah, *et al.* (1996); Jaques *et al.* (2006); Notstaller (1987); Eshun and Mireku-Gyimah (2002); Spiegel (2012); Cartier and Burge (2011); Hruschka (2012); Keita (2001); Bawa (2008); Amankwah and Anim-Sackey (2003); Okyere (2012); Telmer and Persaud (2013); Telmer (2011); Anon. (2008) and Hentschel *et al.* (2003) have identified the following characteristics of ASGM:

- Selectivity of deposits and mobility of mine sites;
- Lack of investment capital;
- High labour intensity;
- Informal/illegal activities;
- Low level of technology and improvised extraction methods;
- Lack of management skills and poor entrepreneurial attitude;
- Employment opportunities at community level;
- Remote mine sites;
- Traditional administrative authority and outlook;
- Widespread attachment to superstitious beliefs and fetish practices;
- Lack of knowledge about legal requirements;
- Limited access to mining titles;
- High tax burden on legalised ASGM operators; and
- Seasonal switching or alternation of gold mining with farming; and
- Negative environmental, health and safety impacts.

ASGM is known to be associated with serious environmental problems such as land degradation, loss of farmlands, deforestation, water pollution and release of toxic chemicals (Nyame, 2010; Heemskerk and Olivieira, 2003; Swain *et al.*, 2007; Ingram *et al.*, 2011; Eshun and Mireku-Gyimah, 2002; Keita, 2001). The environmental degradation in Anka, a typical ASGM town in Zamfara State, North-western Nigeria, is due to sporadic gold mining activities which have posed serious challenges to the communities. In 2011, for example lead poisoning led to many deaths among children across several communities in the area, creating an emergency situation which led to the ban on mining activities in all the affected villages. Poor environmental management practices and lack of responsibility for environmental remediation have left most of the mined-out-pits unreclaimed; some pits run into several tens of meters deep and become flooded during rainy season and thus serve as death traps for miners, other residents and animals. These have worsened the already escalated environmental, health and safety hazards in the area.

Across the world, poor management has made ASGM an unprofitable business; productivity is generally very low (Jaques *et al.*, 2006); and the miners' incomes are very low. In Anka in particular, the low incomes of the miners and the high expenditure on their large families have further impoverished them. Thus, miners in the area seem to be trapped in a vicious circle of poverty and vulnerability.

This paper identifies the stakeholders responsible for the ASGM activities in the study area and evaluates the effectiveness of their management roles. The main objective is to find any shortfalls and challenges, and prescribe measures that would improve ASGM to become safer and more profitable.

## 2. Materials and Methods

### 2.1 Brief Information about the Study Area

Anka, the study area, is located in Zamfara State, North-western Nigeria. It is one of the fourteen Local Government Areas of the State. It lies within latitudes  $11^{\circ} 40' 0''$  and  $12^{\circ} 20' 0''$  North and longitudes  $5^{\circ} 50' 0''$  and  $6^{\circ} 20' 0''$  East and it is about 80 km from Gusau, the State capital. It has an area of 2 746 km<sup>2</sup> and a population of 142 280 as at the 2006 population census (Anon, 2006), representing about 4 % of the population of Zamfara State.

Anka is one of the major areas where gold deposits are located within the Schist belt of North-western Nigeria (Wuyep *et al.*, 2007). According to Garba (2000) and Garba (2003), the Schist belt is made up of many rock types such as: gneisses, schists, phyllites, quartzites, Banded Iron Formations (BIF), amphibolites and granitoids. Such rocks are products of the Pan-African event ( $550 \pm 100$  Ma).

Fig. 1 shows the selected study communities (Abare, Dareta, Gonar-Kowar, Sunke, Shabili and Bagega) in Anka where massive ASGM activities take place. ASGM activities are generally segmented into the following three sections:

- (i) Rock breaking activities such as drilling and blasting mostly in the remote bushes of Abare, Dareta, Horo-Sunke and Gonar-Kowar;
- (ii) Haulage of ore from the mining sites to processing points in Bagega and Shabili; and
- (iii) Processing of gold ores and transportation of gold bars to marketing points in Bagega, Shabili and Gusau.

Peculiar characteristics of ASGM in Anka include the following:

- (i) Women are not involved in gold mining in Anka; so, all activities are carried out by the men. This is probably due to the beliefs and customs of the people in the area; and
- (ii) Mining and farming being the two major occupations of the people in the area are alternated during the rainy and dry seasons. The miners abandon mining for farming during rainy season, when most of the pits are flooded.

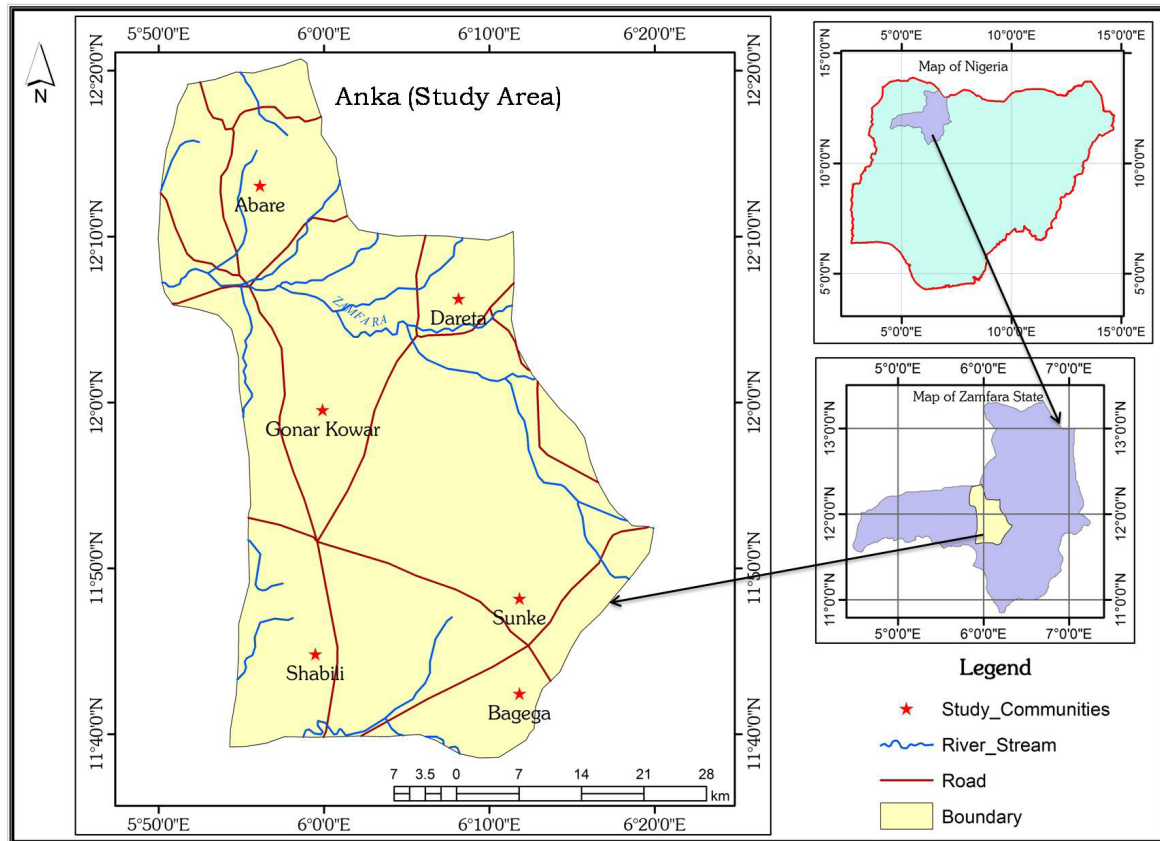


Fig. 1 Map of Selected Study Communities in Anka, Zamfara State, Nigeria

The management of gold mining activities in Anka and its environs is structured in line with the traditional set up and cultural practices of the people in the area. The hierarchical order of the management structure is strictly followed and respected by all the persons involved thereby creating a unique leadership style and clear separation of power at each level (see Fig. 2). As can be seen, the community leaders in Anka Emirate Council, as a matter of traditional task, oversee the overall management of ASGM activities in the area. The government’s control of ASGM activities is discharged through the Ministry of Mines and Steel Development (MMSD) and other government agencies. The community leaders often collaborate with the government and international organisations to discharge their management functions.

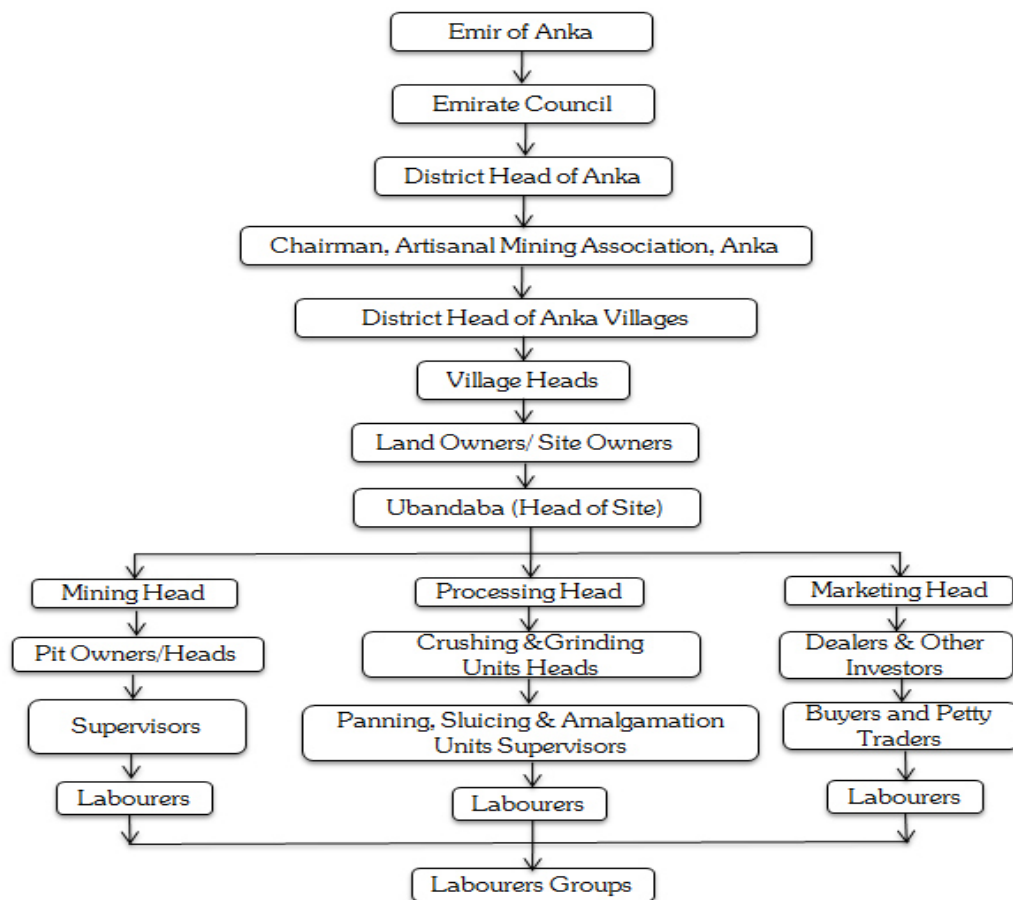


Fig. 2 Management Structure of ASGM in Anka

## 2.2 Identification of Stakeholders in ASGM Management in Anka

There are various stakeholders responsible for the management of ASGM in Anka. Each of them contributes differently to the activities leading to the overall development and management of ASGM in the area. The identified stakeholders in ASGM management in the area include regulators (government agencies); community leaders; local miners (operators); buyers, contractors, middlemen; and development partners (e.g. international organisations, civil societies, governmental and non-governmental organisations).

## 2.3 Management Functions of ASGM Stakeholders in Anka

The management functions of the regulators, that is, the Mines Inspectorate Department (MID) of the Ministry of Mines and Steel Development (MMSD) and the Artisanal and Small-scale Mining (ASM) Department, include enforcement of government policies on ASGM activities and organisation of miners into cooperative groups. These functions are meant to ensure miners' compliance with government policies and to prevent their involvement in illegal ASGM activities.

The functions of the local community leaders in the Anka Emirate Council include the administration of the traditional institutions and management of occupational activities of the people in the area, including ASGM activities. The community leaders also perform advisory roles and collaborate with the government on the control and regulation of ASGM activities.

The local miners in Anka constitute the ASGM operators. Their major function includes the management of gold mining, processing and marketing in the area. They are also obliged to maintain a clean, peaceful and friendly business environment devoid of environmental hazards, chaos and disputes.

The contractors, buyers, middlemen, and other partners in ASGM activities perform marketing functions which contribute to the overall growth of the business activities in the area. These categories of stakeholders include both local and international businessmen whose aim is to transact ASGM-related businesses. They sometimes

perform advisory and collaborative roles depending on their individual experiences on ASGM activities.

The development partners in Anka generally perform humanitarian and supporting roles aimed at safeguarding the well-being of the people in the area. The Medicines Sans Frontiers (MSF) known as 'Doctors without Borders' basically render medical services to the communities, while the Artisanal Gold Council (AGC), Blacksmith Institute of New York and Terragraphics Environmental Engineering from USA render ASGM-related technical services such as the remediation of the affected communities and promotion of safer mining programmes in the area. The operations of these international organisations are complemented by the Federal Ministry of Health and Zamfara State Ministry of Health, Environment and Water Resources. Civil society and some non-governmental organisations are also in the area to implement advocacy programmes on the impact of illegal ASGM, child labour and other social issues.

#### 2.4 Methods Employed in Evaluating Stakeholders' Roles in ASGM Management

In this study, certain evaluation methods were adopted to examine the roles played by the various stakeholders in the management of ASGM activities in Anka and its environs. The evaluation techniques include: conceptual analysis; Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis; Political, Economic, Social, Technological, Legal and Environmental (PESTLE) analysis; Major Objectives, Target activities and Action Plan (MOTAP) analysis; and Stakeholders, Experts and Local Opinions (SELOP) analysis. Some of these methods have been combined in order to have a holistic evaluation of stakeholders' roles in ASGM management.

##### 2.4.1 Conceptual Analysis of Government Policies on ASGM

Conceptual analysis, an evaluation tool which makes conceptual distinctions and organises ideas about an issue, was used to assess the government policies on ASGM management. This study used similar conceptual approach adopted by Moti and Vambe (2009) and Evans (2007) to diagnose government policies.

Two components of government policies (legislation and its enforcement strategies) on the Nigerian ASGM sector were subjected to conceptual analysis. Both descriptive and analytical forms of conceptual frameworks were employed for the evaluation of government policies on ASGM. The conceptual definition of the body of government policy and its structural frameworks or arrangement as an instrument of government formed the two major premises upon which conceptual analysis in this research has been conducted. Additional steps were also taken to identify policy objectives and instruments, including implementation strategies, in order to evaluate government policies.

##### 2.4.2 SWOT Analysis of Government Policies on ASGM

The fundamental concept of Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis involves the consideration of strengths and weaknesses of an organisation as the internal factors, and opportunities and threats as the external factors relating to the organisation's environment. In this study, the SWOT analysis has been used to evaluate government policies on ASGM in Nigeria. Information about the internal and external factors that may have an impact on government legislation and enforcement strategies concerning ASGM in the country were collected and analysed.

The use of SWOT analysis as an evaluation tool in this study is also evidenced in the study of Lowe (2006) who used it to assess the management of Guyana Geology and Mines Commission which oversees the small-scale gold mining sector in Guyana. Its use by Suh and Emtage (2005) in community-based forest management also supports Lowe's assessment. Though Babalola and Tihamiyu (2013) employed SWOT analysis only to assess the Nigerian business environment, their evaluation also touches government policies through which such environment is regulated for responsible business activities.

##### 2.4.3 PESTLE Analysis of ASGM Operators' Roles

Political, Economic, Social, Technological, Legal and Environmental factors (PESTLE) analysis was adopted in this study because of its suitability to the external socio-economic and environmental conditions of ASGM in Nigeria. For instance, environmental factor would be difficult to be subsumed under any other factor due to its prominence in terms of its impacts, local regulation and public perception, among other reasons. Legal factor was also considered as an outstanding factor in this research because of government policies and enforcement on ASGM, as well as concession acquisition issues. The PESTLE analysis was therefore used to assess the Nigerian ASGM external business environment.

Combining the use of PESTLE and SWOT analyses highlights the opportunities and threats to which the ASGM businesses are exposed, thereby helping to open up the decision mechanisms of the ASGM operators. This

combination, therefore, affords a thorough evaluation of both the organisational structure and business environment of ASGM, identifying practical approaches which the ASGM managers adopt in managing their business challenges.

#### 2.4.4 MOTAP and SELOP Analyses of Stakeholders' Roles

Major Objectives, Target Activities, and Action Plan (MOTAP) and Stakeholders, Experts and Local Opinions (SELOP) analysis was used to complement SWOT and PESTLE analyses in evaluating the roles of stakeholders in ASGM management.

MOTAP analysis examines the Major Objectives (MO) of ASGM management functions, the Target Activities (T), and Action Plan (AP) put in place by various authorities for its development. Objectives afford stakeholders the opportunities to measure their performance and assess the level of efficiency attained.

Analysis of Major Objectives (MO) was carried out to evaluate the management functions of: regulators; operators; and other stakeholders such as community leaders, non-governmental organisations and donor agencies in the area. Analysis of Target Activities (T) was specifically employed to evaluate the operators' major and complementary activities. Analysis of the Action Plan (AP) was also done to evaluate action plans of local community leaders, non-governmental and international organisations on the management of ASGM-related activities.

Three evaluation criteria were used to examine the major objectives of management functions of the regulators as far as ASGM activities in Nigeria are concerned. These included technical, financial and logistic efficiency, aimed at determining the extent to which regulator's planning, organising, coordinating and controlling functions on ASGM activities are successfully executed. The use of such criteria in this case can be justified considering the compatible alignment between government programmes and organisational objectives (Allen, 1996); hence, the use of their analytical principles in this study is akin to effective evaluation of regulators' management functions.

The evaluation criteria used for examining the management functions of ASGM operators also included technical, financial and logistic efficiency. These criteria were used for appraisal because, like government agencies, ASGM operators assume a major role in managing their activities using technical, financial and logistic capability. Hence, to sustain a long term organisational performance which has remained a big challenge to small and medium enterprises (Ates *et al.*, 2013), there is the need to satisfy the technical, financial and logistic requirements of ASGM business by its managers. Therefore, these criteria were employed to determine the extent to which ASGM operators perform their management functions in order to enhance organisational development in the sector.

Evaluation of the major objectives of the other ASGM stakeholders in Nigeria was done using two major indices, namely field experience and literacy level. The stakeholders include the community leaders, artisanal miners' association chairman, as well as non-governmental organisations. The use of these two parameters is premised on the observatory and participatory roles that most of the stakeholders play in ASGM management rather than direct regulatory functions. Activities of such experienced and knowledgeable stakeholders provides clear understanding of the issues at stake, as their involvement facilitates problem-solving initiatives through collaborative public discourse (Morse *et al.*, 2006; Sharma, 2008).

To evaluate the local miners' Target Activities (T), two criteria were employed as evaluation tools, namely performance management and impact of activities. In the case of non-ASGM activities, the impact generated and their relationship with ASGM activities were chosen as the criteria. Farming was selected as the major complementary activity examined, being the main occupation of the local miners, especially during the rainy and planting seasons, while trading of ASGM accessories and spare parts, craft works and other local community services were considered as the non-ASGM activities.

To evaluate the Action Plan (AP) of the regulators, community leaders and non-governmental organisations, the selected criteria included efficiency of planning instrument, intervention components and extent of the AP impact on ASGM. The same evaluation criteria were selected for these stakeholders despite their structure, capacity and size because they are considered to be working towards achieving the same goal in this case, though with different APs. To examine the impact of the AP of each of the stakeholders, indicators such as intervention projects, views of the beneficiaries (*e.g.* miners and local residents) and score cards were assessed and used as a measure.

The consideration of SELOP analysis is premised on the fundamental importance of stakeholders, experts and miners in the ASGM sector in terms of knowledge, experience and vital information dissemination on all issues relating to the sector. Their opinions were considered in order to have an all-inclusive evaluation of ASGM management. The extension services and collaborative efforts of these stakeholders provide a leading role in community development (Morse *et al.*, 2006); their objective opinions on ASGM issues may not bring a perfect judgment, but will provide a comprehensive diagnosis of issues and practical suggestions that can address challenges facing the ASGM sector.

To evaluate the Stakeholders and Experts' Opinions (SE) on ASGM management in the area, the views of both internal and external stakeholders as well as experts on ASGM were examined respectively. Local miners' views were mainly considered as Local Opinions (OP). The opinions of the internal stakeholders considered included those of community leaders in Anka Emirate Council, officials of Zamfara State Ministries of Environment and Solid Minerals, Health and Water Resources, Federal Mines officials in Zamfara State. The external stakeholders whose opinions were considered on ASGM in Nigeria included international organisations and donor agencies from outside Zamfara State, North-western Nigeria and ASGM business men and contractors from outside the state. To examine internal experts' opinions, some community leaders who were formerly miners with wealth of experience in ASGM were considered in addition to the Federal and State Mines officials. External experts' opinions considered included those of mining experts, ASGM operators and managers of industries outside Zamfara State and Nigeria. Information on the opinions of selected internal stakeholders, experts and local miners was obtained through questionnaire administration and structured interviews. Opinions of external stakeholders and experts were used to evaluate the effectiveness of ASGM management.

### 3. Evaluation of Stakeholders' Roles

#### 3.1 Conceptual Analysis of Stakeholders' Roles

Conceptual analysis of government policies on ASGM in Nigeria brings out the following findings:

- i. The legislative and regulatory structure of government is defective in as much as there is no department to enforce ASGM rules (see Fig. 3), although Artisanal and Small-scale (ASM) Department exists to oversee the informal mining sector. The absence of a distinct ASGM Department has, therefore, given rise to sporadic ASGM activities in the minefields.
- ii. Centralised licencing application system has also increased miners' non compliance, thereby encouraging the smuggling of gold out of Nigeria to neighbouring West African countries.
- iii. There are a lot of bureaucratic bottlenecks and misplaced priorities in the mining sector. As a result, effective collaboration among the Federal, State and Local governments in the fight against illegal ASGM activities has been stifled.

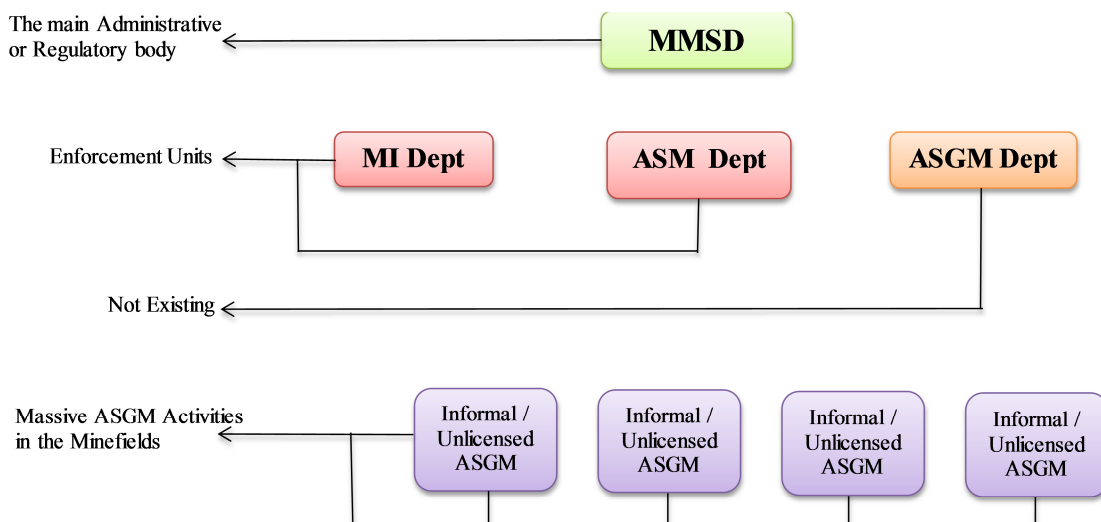


Fig. 3 Conceptual Analysis of Regulators' Roles on ASGM Management

#### 3.2 SWOT Analysis of Stakeholders' Roles

Based on the SWOT analysis of government's roles in ASGM in Nigeria, a 2 by 2 SWOT matrix was developed, showing the summary of the internal and external analyses of the identified SWOT (see Table 1).

Table 1 SWOT Matrix of government's Roles on ASGM Management

	<b>Strengths (Internal)</b>	<b>Weaknesses (Internal)</b>
<b>Opportunities (External)</b>	<p><b><u>Clear Priorities</u></b></p> <ul style="list-style-type: none"> <li>-Possible decline in illegal ASGM and associated impacts.</li> <li>-Miners' compliance is feasible.</li> <li>-Improved revenue and stable political economy.</li> <li>-Feasible business and investment opportunities.</li> <li>-Youth employment and crime reduction.</li> </ul>	<p><b><u>Potential Alternatives</u></b></p> <ul style="list-style-type: none"> <li>-Evolve policies on ASGM and involve community leaders on enlightenment campaigns.</li> <li>-Simplify registration procedures in the ASGM sector.</li> <li>-Centralise MCA functions and educate miners on their importance.</li> <li>-Create ASGM management committees and units at State and Local Government Levels.</li> <li>-Enforce the law strictly.</li> <li>-Collaborate with local authorities on the development of the ASGM sector.</li> </ul>
<b>Threats (External)</b>	<p><b><u>Defend and Counter</u></b></p> <ul style="list-style-type: none"> <li>-Compliance threatened by miners' ignorance of the law.</li> <li>-Weak legislation and poor enforcement encourage illegal ASGM.</li> <li>-Struggling still thrives amidst good policy but poor implementation.</li> <li>-Viable investment is threatened by rural underdevelopment.</li> <li>-Socio-environmental, health and safety concerns threaten sustainable ASGM.</li> </ul>	<p><b><u>Potential Risks</u></b></p> <ul style="list-style-type: none"> <li>-Continuous illegal and underdeveloped ASGM sector.</li> <li>-Rising cases of smuggling.</li> <li>-Increased violence and criminality.</li> <li>-Persistent mercury-dependent gold processing.</li> <li>-Rising environmental Risks and impacts.</li> <li>-Increase in child labour and corresponding negative effect on child education.</li> <li>-Lead poisoning threat feasible.</li> <li>-Cattle rustling a growing threat.</li> </ul>

### 3.3 SWOT-PESTLE Analysis of Stakeholders' Roles

Table 2 presents the results of SWOT-PESTLE analysis of ASGM management in Anka. It could be deduced that ASGM investment lacks modern management touch; hence, the impoverished gold mining business activities in the area are devoid of economic sustainability. Investment in the area is also threatened by unstable political climate and chaotic business environment. Furthermore, there is lack of proper environmental management.

The economic instability of ASGM in Anka implies that the entrepreneurial and managerial capacity of ASGM operators have not been developed and deployed to effectively manage their business as posited in the research of Eshun and Mireku-Gyimah (2002) on small-scale mining in the Tarkwa District of Ghana. Hence, there is loss of economic prosperity in business within the ASGM sector.

Studies by Jaques *et al.* (2006); Azubike (2011); Al-Hassan *et al.* (1997); Nyame (2010); and Telmer and Persaud (2013) also show that land encroachment by the local miners through their sporadic movement and activities and poor environmental management further expose the ASGM communities to worsening health and safety hazards.



Table 2 SWOT-PESTLE Analysis of Stakeholders Roles on ASGM Management

SWOT/PESTLE	Strengths (S)	Weaknesses (W)	Opportunities (O)	Threats (T)
<b>Political (P)</b>	1. Availability of experts to make inputs to policy making. 2. Better control of ASGM at the local level.	1. Lack of political will during policy implementation. 2. Corruption.	1. Future investment and job prospects in a stable political climate.	1. Volatile business environment.
<b>Economic (E)</b>	1. Growing local ASGM economy.	1. Poorly managed and impoverished ASGM economy.	1. Future investment and job prospects.	1. Economic jeopardy due to environmental hazards.
<b>Social (S)</b>	1. Highly respected local authorities. 2. Occupational alternatives to ASGM.	1. Harmful socio-cultural practices.	1. Socially beneficial future ASGM.	1. Negative perceptions of government policies.
<b>Technological (T)</b>	1. Improvised local technology and use of mobile phones.	1. Poor technology and unskilled workforce.	1. Future development of local technology.	1. Use of technological device for crime.
<b>Legal (L)</b>	1. Traditional legal system-based concession acquisition and ASGM management.	1. Stringent legal requirements and ignorance of the law.	1. Feasible legalisation of ASGM due to robust local administration.	1. Land use conflicts and low legal status of operators.
<b>Environmental (E)</b>	1. Reduced women exposure to ASGM related risks.	1. Poor environmental management.	1. Sustained environmental campaigns by interest groups.	1. Land degradation, pollution, mercury emissions and lead poisoning.

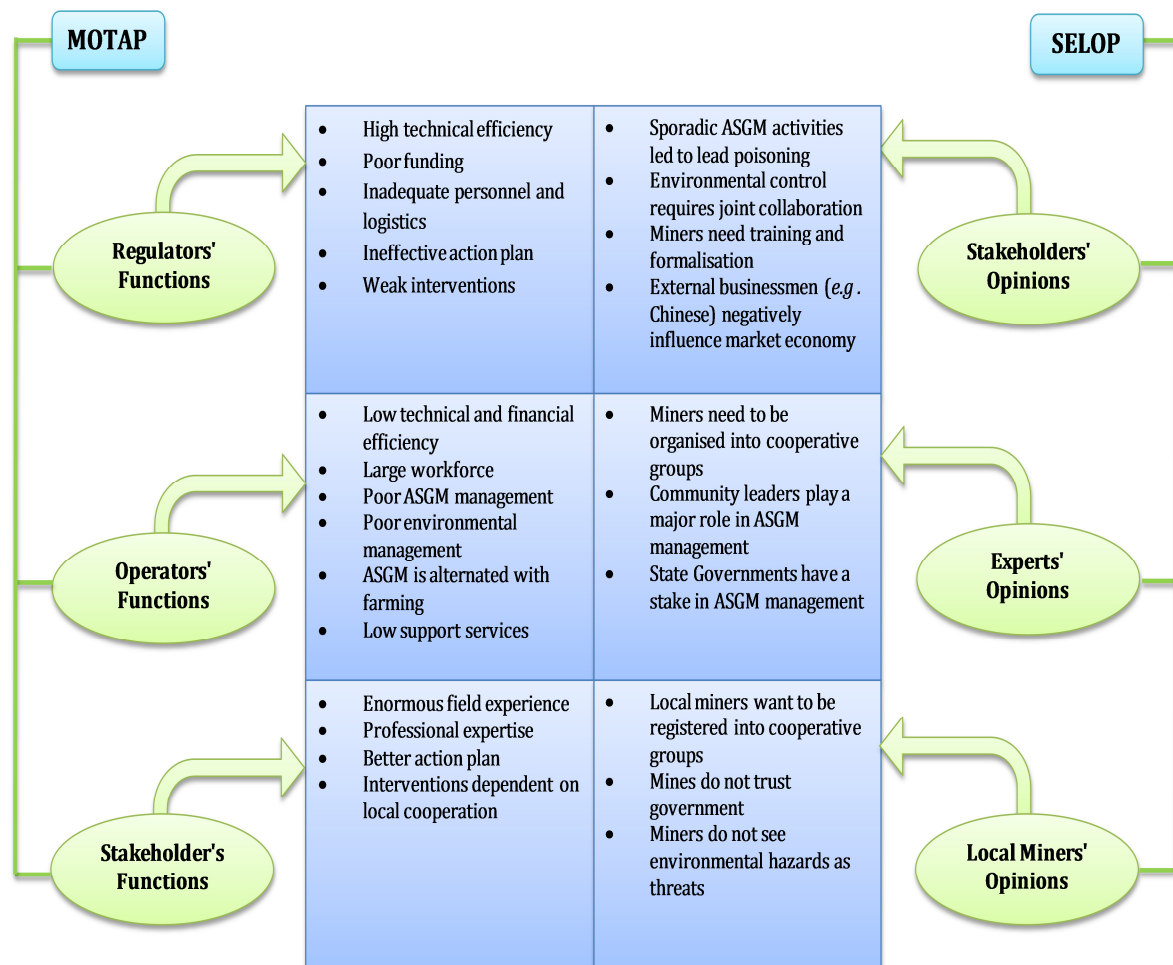
### 3.3 MOTAP-SELOP Analysis of Stakeholders' Roles

MOTAP-SELOP analysis, as illustrated in Fig. 4 shows that in spite of the technical efficiency of government agencies in terms of field knowledge and expertise, inadequate funding and lack of logistics have remained direct effects of ineffective control and regulation of ASGM activities by the regulators. This was evidenced in the slow response of the Nigerian government to the lead poisoning epidemic caused by haphazard gold mining activities in Zamfara State, North-western Nigeria in 2010 until the arrival of international donor organisations as alluded to by Telmer (2011). According to Hentschel *et al.* (2002); Hilson (2007); and Hilson and Maponga (2004), it is increasingly becoming difficult for governments in developing countries to effectively formalise miners' activities and carry out interventions in the ASGM without the assistance of international organisations and donor agencies. Hilson and Maponga (2004) and Heemskerk (2005) have traced such ineffective regulators functions to inadequate information about the local miners, their locations and activities, and difficulty in obtaining information on miners' microeconomic data.

MOTAP-SELOP analysis also shows that ASGM community leaders possess enormous field and administrative experience in ASGM management. Hence, a robust partnership exists between them and the non-governmental and international donor agencies on ground in ASGM communities. This is reflected in their action plan and interventions during emergency, thus indicating that the success of the intervention programmes of both the government and non-governmental agencies depends largely on the cooperation of ASGM community leaders.

The evaluation of the roles of regulators, operators and the other stakeholders in the ASGM sector through MOTAP-SELOP analysis, therefore, attempts to establish a link between them on the management of ASGM activities. Thus, a relationship is shown between the concerned thoughts of the stakeholders (SELOP) and practical manifestation of their actions (MOTAP) of ASGM with a view to finding a common ground for its effective management in a sustainable and environmentally responsible manner.

Fig. 4 Summary of MOTAP-SELOP Analysis



#### 4. Conclusions and Recommendations

This paper has used conceptual, SWOT, PESTLE, MOTAP and SELOP analyses to evaluate the roles played by the various stakeholders in the management of ASGM in Anka, Zamfara State, North-western Nigeria. The main findings are that:

- Weak government legislation, poor policy enforcement, stringent licencing procedures, poor government attention and support, and centralisation of government functions have been identified as the major obstacles militating against the management functions of the government to effectively regulate the ASGM sector.
- Organisation of the local miners into cooperative groups has not been effectively done, thereby hampering their full integration into formal mining.
- ASGM is seen to be dominated by illegal and haphazard gold mining activities carried out by unlicensed local miners, giving rise to chaotic and violent minefields, enormous economic loss and severe environmental degradation.
- It is also established that ASGM management by the local operators is fraught with lack of management knowledge and skills, resulting in uncoordinated, poorly managed and impoverished business enterprise with little or no contribution to the national economy.

It is recommended that the government regulatory functions on ASGM should be decentralised to the State and Local Government levels to make enforcement more effective. There should be guidelines and incentives (e.g. accessibility to loans and equipment supply) to encourage the local miners to form cooperative groups and fully

integrate them into the formal mining sector.

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