2019

AN OVERVIEW OF ARTISANAL AND SMALL-SCALE MINING IN ZAMBIA

ZAMBIA EITI Extractive Industries Transparency Initiative

OXFAM

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATION

ACP-EU	African, Caribbean, and Pacific European Union
AMR	Artisanal Mining Rights
ASM	Artisanal and Small-scale Mining
CSR	Corporate Social Responsibility
FGD	Focus Group Discussions
MMMD	Ministry of Mines and Minerals Development
NAPSA	National Pensions Scheme Authority
NGOs	Non-Governmental Organisations
OECD	Organisation for Economic Corporation and Development
RMB	Regional Mining Bureau
SEL	Small Scale Exploration Licence
SML	Small Scale Mining Licence
SPSS	Statistical Package for Social Sciences
ZEMA	Zambia Environmental Management Agency
ZRA	Zambia Revenue Authority

EXECUTIVE SUMMARY

Introduction

The ASM sector has increasingly become significant in the recent past. Zambia, like several other countries in the ASM sector, has been struggling to enhance and estimate the real contribution of the sector to the national economy mainly because most activities are not formalized and are often associated with illegal mineral supply chains. The Zambian Government is currently implementing the Seventh National Development Plan (7NDP) which recognizes the ASM sector as having the potential to contribute to significantly to economic diversification and poverty reduction. As part of the diversification agenda within the mining sector, Government has made efforts to build the productive capacity of artisanal and small-scale miners involved in the exploitation of gemstones and industrial minerals. Despite Government efforts, the ASM sector in Zambia has failed to generate significant revenue to alleviate poverty and enhance economic growth.

Additionally, the sector has not substantially contributed to the national treasury mainly due to the weak enforcement of the legal and regulatory policy framework as well as the lack of financial, technical and human capital required to effectively exploit the minerals in the sector. The sector is associated with negative vices such as child labour; violent conflicts; abuse of especially female artisanal miners; high HIV/AIDS prevalence as well as unplanned settlements with poor sanitary conditions. There is also evidence of the negative environmental impacts of ASM activities across country which have resulted in unrehabilitated excavations, land pollution (effluent dumping), air pollution (dust emissions), water pollution (release of chemicals such as mercury, acid mine water, river siltation) and deforestation. Maximising the benefits from the country's ASM sector without compromising the country's sustainable development agenda therefore becomes extremely critical.

Methodology

The study was conducted in six (6) provinces including Eastern, Central, Luapula, Copperbelt, Southern and Lusaka Provinces and (22) districts across these provinces. Data was collected using a mixed approach combining qualitative and quantitative methods across a sample size 383 interviewees communities, government and traditional leaders. These included Site Owners, Site Workers, Traditional Leaders, District Commissioners, Local Authority Officers, Mining Bureau Officers, the Permanent Secretary and the Directorate at the Ministry of Mines and Minerals Development, community informants, Provincial Permanent Secretaries. This study employed purposive and snowball sampling methods and analyzed using the Statistical Package for Social Sciences (SPSS) version 23.

Key Findings

The study interviewed different groups of people across the provinces to share their views and experiences on ASM an these included; site owners; site workers; government representatives from government departments and traditional leaders.

ASM Site Owners

The study found that the majority (83%) of site owners were males whilst only 17% were females as shown in Figure 1 below. Most (69%) of these site owners were producing manganese, aggregate and gold while the rest were mining tourmalines, amethyst and silica.

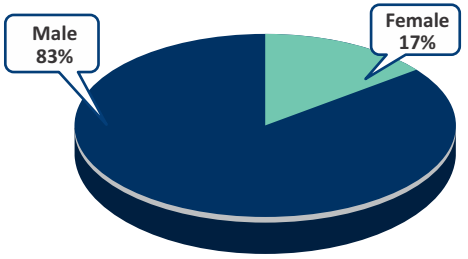

Figure 1: Distribution of Site Owners by Gender

In terms of ownership of the firms distributed by nationality, the study found that 94% of the ASM companies surveyed are owned by Zambians and only a small proportion of 6% are owned by non-Zambians. This is contrary to the popular views that most licenses are owned by non-Zambians. Figure 3 below depicts this:

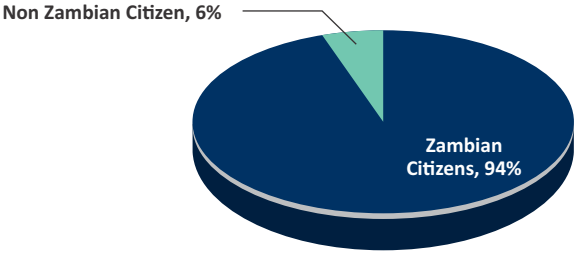

Figure 3: Site Ownership of the Firm by Nationality

Possession of Mining Licenses

This study found that 17% of the players did not have mining rights. Though the percentage is small; it might be higher with a larger sample of players. Furthermore, this study found that 19 licenses were not preceded with an exploration licenses as required by mining law.

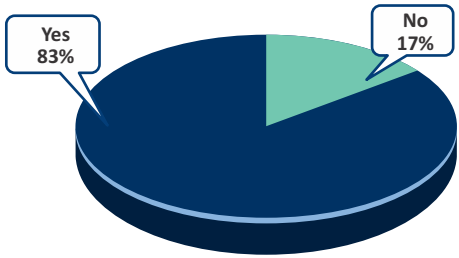

Figure 4: Possession of Mining Licenses

Contribution of ASM Sector to Economy

With regards to paying taxes, the survey found that 60% of the firms do not pay taxes to the Zambia Revenue Authority (ZRA). As such, the government is losing out on potential revenue that could be collected from the sector to finance development. The study also found that only 10 local councils out of a total 23 councils sampled receive payments from the ASM sector and the payments are usually in form of Business Levy, Personal Levy, Mineral levy and Cargo levy as shown in table 2 below. This scenario reveals that most ASM activities in the districts are not formalized.

Types of Employment

The study also found that the majority (67%) of respondents were employed as casual workers and whilst less than half were employed on a permanent and contracts basis. This is an indication that majority of the workers in the ASM sector are casual workers, which could be as result of the high illiteracy levels which invariably results in a low bargaining power to demand for better working conditions from the mine site owners.

Views of Traditional Leaders

Four (4) of the seven (7) traditional leaders interviewed stated that their royal establishments are consulted by the existing and prospecting miners on issues pertaining to the ASM sector in their chiefdoms and this entails providing their views on would be mining right holders prior to the Cadaster Department granting them licenses. With regards to economic and social benefits emanating from ASM activities, four (4) traditional leaders revealed that ASM activities had provided employment opportunities for their local community members whilst wo (2) indicated that their chiefdoms have never benefited from any employment opportunities despite the existence of ASM activities in their area.

Mining Cadaster and Geological Department Perspectives

As of August 2019, the Mining Cadastre register showed that there were 1,666 active Artisanal and Small-Scale mining rights in Zambia. Under section 34 of the Mines and Minerals Act of 2015, the duration for Artisanal mining licences is 2 years and 10 years for small scale mining. The current high number of active ASM licenses shows a growing interest from the public to venture into ASM mining activities.

Policy and Regulatory Framework Study Perspective

The study found that the legal framework is adequate in addressing legal matters related to the ASM sector and that most formalized ASM players are adhering to the requirements of the Mines and Minerals Development Act as evidenced by an increase in the percentage of site owners adhering to the requirements of the law governing the ASM sector. However, it was revealed that there is still need to strengthen the regulatory framework by introducing deliberate policies and measures aimed at enforcing legislation such as routine inspections by the Ministry of Mines and Minerals Development to ensure that players fully comply with the provisions of law and sensitize illegal miners on the importance of formalizing their operations.

Social and Environmental Effects of ASM Activities

In as much as the ASM sector has brought to the fore some economic and social benefits to the local communities, most participants, including traditional leaders disclosed that ASM activities in their areas have contributed to escalating adverse social vices such as the violation of children's rights, including right to education. Firstly, the study found that there were land disputes emanating from ASM activities and these disputes are usually between mining licenses holders and those with surface rights and mostly associated with land encroachment and displacement. Secondly, the study found that the impact of ASM activities on the environment have been numerous and these ranged from land degradation such as unburied ditches, deforestation to displacement of animals from their natural habitation. In other cases, the ASM activities such as uncontrolled excavation has resulted in ground water pollution as well as poor solid waste disposal at ASM camps resulting in the pollution of the environment including water bodies around the mining sites.

Gender Dimension in the ASM sector

Findings of this study reveal that only 17 percent of women own mine sites in the ASM sector compared to men at 83 percent. This confirms that ownership of ASM firms in Zambia is male dominated with major sector related decisions made by male mine owners to favour themselves and the male site workers. Another deduction from this is that male owners

make majority of the decisions to represent the women mine owners which is not representative of the women involved in ASM. The consideration of a suitable work environment at ASM sites is another critical element in that came out in the study. The findings of the study revealed that majority of the mine owners, 63.9% stated that they have no practices in place to minimize the negative impacts on women during mining operations. As such, majority of decisions made by mine owners do not mainstream gender dimensions in their operations to safeguard the working conditions of especially women. Only 5.6 percent of all mine owners noted that they encourage women to participate in sector with the working conditions in place to encourage the respect of women's rights. Additionally, 50 percent of the respondents stated that they did not know what needs to be done to improve the working conditions of women in their mine sites. These are high levels of ignorance in the ASM sector which require immediate attention if the sector is to improve the working conditions of women.

Key Study Recommendations

The following are the key recommendations the study makes:

a) **Enhance capacity of technocrats at MMMD:** Strengthening the capacity of the MMMD and Regional Mining Bureau staff is important for effective service provision such as:

- The Geological surveys and mapping
- Mine planning services, and
- Metallurgical services
- Monitoring and Evaluation of ASM activities.

This will require a strong political commitment that the MMMD receives adequate budget allocation, reliable vehicles and additional relevant professionals with appropriate incentives.

b) **Frequent and comprehensive collection of ASM data.** The Zambia Statistic Agency should frequently collect ASM information at least every 3 years to inform policy interventions in the Sector as well as bridge the information gap in the sector.

c) **Increased support for ASM cooperatives:** Instead of working with individual ASMs, Government should work with cooperatives or encourage SSMs operating in any given area to establish one large joint venture company. This would ease the provision of services as well as reduce the incidences of illegality which are often associated with small scale mining.

d) **Provide Technical and skill training to ASMs:** The technical training and guide with regards to the mining techniques and processing and safety measures is important in to reduce mining accidents and increasing production levels in the sector.

e) **Providing mechanisms for easy access to financial assistance.** Government to facilitate access to credit for the procurement of mechanized and environmentally friendly processing equipment. Government through ZCCM-IH should also consider establishing a finance leasing scheme for the ASMs. This will ensure that the SSMs have ownership of the equipment and thus exercise greater responsibility.

f) **Decentralize the granting of ASM licenses at affordable fees.** This will enhance efficiency in issuing of mining rights and enable more individuals and firms operating illegally to formalize their operations. Additionally, MMMD to strengthen collaboration with Royal Establishments and local governments (Councils) when issuing mining licenses. This crucial in reducing land disputes.

g) **Sensitise Zambians on the provisions of the Mines and Minerals Development Act of 2015 and Mines Regulation of 2016,** including the process of acquiring the Artisanal and Small-Scale mining right.

h) Introduce **a positive discrimination against men** in the awarding of Mining License to increase the number of women holding mining rights in the ASM sector.

i) **Value Addition to Mineral Commodity:** Government must facilitate capacity building of Artisanal and Small-Scale miners to add value to their mineral commodities. There is need to also establish value addition facilities in local areas with mineral resources. Local initiatives to develop value- added processes in the production and marketing chain of gemstones, through lapidaries and jewellery manufacturing is critical in improving the export earnings. In addition, Government through ZCCM-IH should consider participating in value addition activities such as cutting and polishing of gemstones as well as processing of mined ores on behalf of ASMs.

j) **Establish export markets:** government must facilitate establishment of export markets for ASM mineral commodities as this will prevent exploitation of people operating in the sector.

k) **Enhance contribution to Environmental Protection Fund (EPF).** The Mines and Minerals Development Act requires that mine operators contribute to the EPF in the form of cash as well as other forms of security. This fund acts as an insurance for environmental liabilities that are incurred through mining in general. Thus, MMMD should enforce this provision and penalise active ASM operators not contributing to EPF. This will compel the developer to execute environmental and social impact statements in accordance with the Mines and Minerals (Environmental) Regulations. It will also provide protection to the Government against the risk of having the obligation to undertake the rehabilitation of mining areas where the ASM licence holder fails to do so.

g) **ZEMA to strengthen collaboration with the Royal Establishments and Local Government** by sharing the Environmental Impact Assessment Reports. EIA reports for specific firms should be in public domain. This will facilitate monitoring of the ASM firms with regards to its adherence to the environmental regulations.

h) **Undertake frequent exploration to identify mineral deposit sites** - Due to insufficient geological information, miners do not have adequate information to efficiently and effectively conduct their mining activities. Therefore, there is need for more studies to be conducted to identify and delineate ASM sites for increased operational efficiency as well as reduced environmental damages.

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1. INTRODUCTION

One of the greatest challenges facing a developing country like Zambia, is how to effectively benefit from the wealth of mineral commodities, especially those mined in the Artisanal and Small-Scale Mining (ASM) sector. Like many countries with the ASM sector, Zambia has been struggling to enhance and estimate the real contribution of the sector to the national economy. This is mainly attributed to the fact that most ASM activities are not formalized and often associated with illegal trading chain of minerals. However, many policy makers and scholars assert that the ASM sector is an important source of livelihood and income for many poverty-stricken countries and could therefore contribute to economic growth and poverty reduction for especially rural and poor households. In 2017, the Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development estimated that ASM directly employs more than 40 million people whilst equally supporting the livelihoods of over 150 million people across 80 countries worldwide. In addition, it is estimated that there are more than 30,000 Artisanal Small-scale miners in Zambia and about 30% (9000) are women. According to the Zambia's Ministry of Mines and Mineral Development (2019), there are currently 550 small scale mining licenses and 344 ASM licenses.

The Zambian Government is currently implementing the Seventh National Development Plan (7NDP) which recognizes the ASM sector as having the potential to contribute to economic diversification and poverty reduction. As part of the diversification agenda within the mining sector, the Government has focused on building the productive capacity of artisanal and small-scale miners involved in the exploitation of gemstones and industrial minerals. Additionally, the Ministry of Mines and Minerals Development (MMMD) is implementing the ACP-EU Development Minerals Programme which aims at promoting exploitation of development minerals for sustainable economic growth.

Despite its potential economic benefits and these Government initiatives, the ASM sector in Zambia has still failed to generate significant revenue to enable households escape the poverty trap. Further, the sector has not substantially contributed to the national treasury mainly due to the weak legal and regulatory policy frame-work as well as the lack of resources form of financial, technical and human capital required to effectively exploit the minerals in the sector.

Numerous studies (Dreschler 2001, Hilson, 2002 Adriana et al, 2012, ACP 2018) have reported that if the ASM sector is not properly regulated, it can increase inequalities and lead to economic, social and environmental risks, within the associated communities. The problems often associated with ASM include: child labour; violent conflicts; exploitation of especially female artisanal miners; high HIV/AIDS prevalence; and unplanned settlements

with poor sanitation. ASM can also cause enormous environmental impacts, including unrehabilitated excavations, land pollution (effluent dumping), air pollution (dust emissions), water pollution (release of chemicals such as mercury, acid mine water, river siltation) and deforestation. Therefore, maximising the benefits from the ASM sector without compromising on the country's sustainable development agenda is extremely critical.

1.1 Definition of Artisanal and Small-Scale Mining

Currently, there is no globally accepted definition of Artisanal and Small-Scale Mining (ASM). Different jurisdictions define ASM differently. This study adopted the Organisation for Economic Co-operation and Development (OECD) definition of ASM as the formal or informal mining operations with predominantly simplified forms of exploration, extraction, processing, and transportation. In Zambia, extraction of minerals in the ASM sector is most times labour-intensive and undertaken manually, using only peaks, shovels and basins and sometimes using heavy mechanized machinery on a small-scale level. The sector is also characterized by low barriers to entry and widespread informality, which further explains the low productivity and recovery of mineral ores in the sector. A point worth highlighting is that a significant proportion of people engaged in the sector are women, youths and children. Women work as miners and are also involved in other aspects of the ASM value chain, including ore processing, panning and transporting goods whilst also additionally playing a critical role in supporting the industry through their activities as shopkeepers and cooks. However, women are usually marginalized in ASM communities and have limited decision-making power because they are rarely recognized as miners.

However, information on ASM operations in Zambia is scanty and largely not based on rigorous studies. Empirical data is inadequate to comprehend the current social and economic contribution of the sector in Zambia; as well as information on the demographic groups participating in the sector. As such, the actual potential of the sector in Zambia is mainly based on anecdotal information and not well-researched data. Thus, the motivation to undertake this study is to generate robust information to inform enhancement of the formalization process of ASM for effective and efficient governance of the overall sector.

Figure 1: Small scale miners in Luapula Province using simple shovels and peaks to extract the stones

1.2 Study Objectives

1.2.1 General Objective

The general objective of this study was to understand the status of the ASM operations in Zambia.

1.2.2 Specific Objectives

- To understand the ASM formalization (Licensing) process and challenges faced.
- To describe national policies, institutional and legislative framework, strategies and programs on ASM.
- To identify the major ASM players in the ASM value chain in Zambia.
- To describe and understand the contribution of ASM to the local and national economy in terms of revenue, job creation, and value addition.
- To identify the Environmental, Health and Social impacts of ASM activities.

1.3 ASM Value Chain Framework

This study was conceptualized within the ASM value chain as this is in line with the international standard approach. The assessment was done at all the critical stages of the ASM value chain, that is, prospecting and exploration, mining, processing, value addition and marketing as shown in figure 2 below. It is also important to note that livelihood activities do take place at all these stages and various players (site owners, wage laborers, dealers and cooperatives) perform different roles in this process. This framework was also helpful in analyzing the gender roles in the sector as men and women play different roles along the ASM value chain.

ASM Value Chain Framework

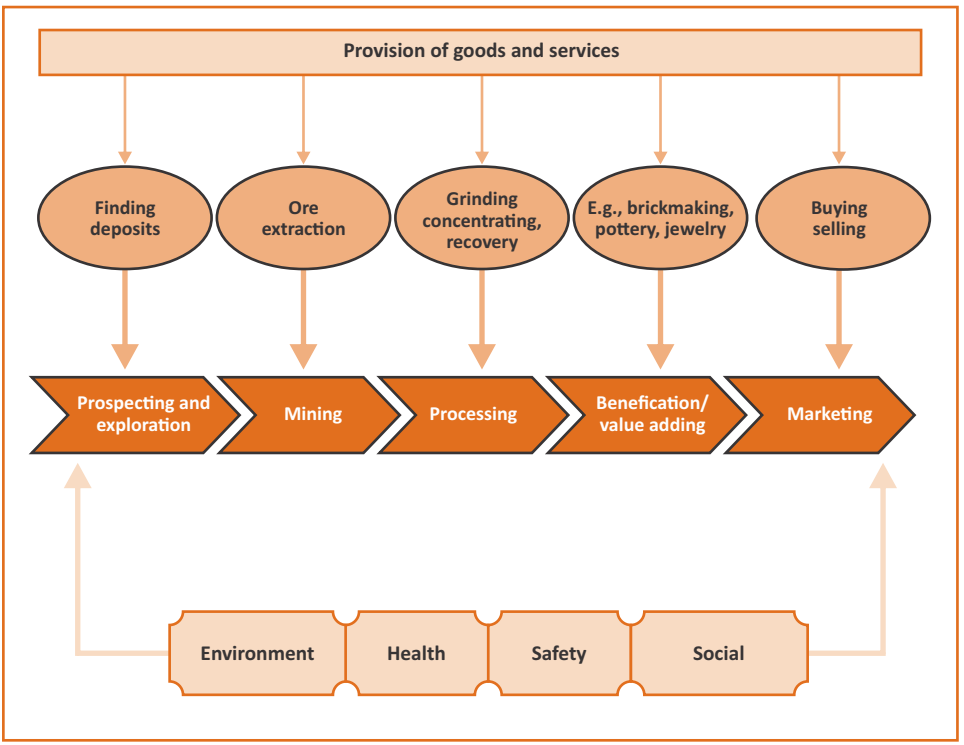


Figure 2: ASM value Chain Framework, Adapted from Adriana et al (2012), World Bank

2. METHODOLOGY

This section provides an insight of the methodology that was applied in conducting the study. It introduces and describes the study area location, target population, research design, sample size, sampling methods, data collection procedures, research instruments and ethical matters.

2.1 Study Areas and Scope

The study was conducted in six (6) provinces and (22) districts as shown in table 1. The study areas were selected based on their higher relative dominance in ASM activities.

Table 1: Distribution of target provinces and districts by mineral commodity

Province	District	Mineral commodity exploited
1. Eastern Province	Vubwi	Gold
	Lundazi	Aquamarine, Garnets, Clear quartz, Rose quartz and Citrine and tourmaline.
	Petauke	Gold
2. Central	Mumbwa	Aggregate, Gold
	Mkushi	Manganese, Tourmaline.
	Kapiri Mposhi	Feldspar
3. Luapula	Mansa	Manganese
	Chembe	Manganese and Sand
	Samfya	Sand and Aggregate
	Chipili	Manganese
4. Copperbelt	Lufwanyama	Emeralds and Aggregate
	Kitwe	Clay, Aggregate, waste rock
	Ndola, Masaiti	Limestone
5. Southern	Siavonga	Flat stones
	Kalomo	Amethyst
	Choma	Aggregate and Sand
	Livingstone	Basalt
	Monze	Gypsum
	Kazungula	Aggregate
6. Lusaka	Lusaka-	Aggregate, Lime stone, Sand and Talc
	Luangwa	Sand
	Rufunsa	Gold
	Shibuyungi	Aggregate
	Kafue	Aggregate

2.2 Study Design

This study used a mixed method design through the use of both qualitative and quantitative methods. This approach increases the reliability and viability of the study as biases inherent in any single method could neutralize the biases of the other method. Additionally, the mixed design provides a better understanding of matters in the ASM sector than either quantitative or qualitative approach by itself.

2.3 Target Population and Sample Size

The study population was drawn from six (6) provinces targeting active ASM site workers, site owners, traditional leaders, district commissioners, local authority officers, mining dureau, Director-Mining Cadaster Department and Director – Geological Survey Department. These participants were targeted because they are key stakeholders and have expert knowledge of the ASM sector. Further, the criteria of selecting the target population was primarily based on the dominance of the selected ASM groups in their respective provinces.

The sample size for this study comprised of a total of 383 interviewees, with the breakdown of :77 Site Owners, 99 Site Workers, 9 Traditional Leaders, 23 District Commissioners, 35 Local Authority Officers, 4 Mining Bureau Officers, the Permanent Secretary and the Directorate at the Ministry of Mines and Minerals Development, 27 key community informants, 4 provincial Permanent Secretaries and 7 Focus Group Discussions consisting of 15 people each (105 interviewees).

2.4 Sampling Technique

This study employed purposive and snowball sampling methods. Purposive sampling was used in selecting respondents from the local authorities, the Ministry of Mines and Minerals Development, District Commissioner's Office and Traditional Leaders. Purposive sampling approach is useful for the identification and selection of information rich respondents associated to the phenomenon of interest (Palinka et al., 2015). Snowball sampling was used to identify hard to find key informants such as site owners.

2.5 Data Collection and Analysis

Owing to nature of this study and the diversity of participants, the study employed different types of data collection techniques where both primary and secondary data sources were used. Primary data was obtained through interviews using semi structured Questionnaires, Focus Group Discussions (FGDs) and Observations. Observations were used for mining operations whilst 7 FGD each consisting 15 participants were conducted at the different mining sites. The ASM site visits were important in capturing a full state of the socio-

economic condition of the ASM, mining processes, health and safety, marketing and environmental and social effects, challenges and opportunities to mention but a few.

Secondary data was collected using related published research study reports, articles, Journals and policy documents such as the Mines and Minerals Development Act of 2015, 2013 Mineral Resource Development Policy and the 7th National Development Plan.

The data collected was subjected to rigorous scrutiny to check for possible errors and misrepresentations. Quantitative Data was analyzed using the Statistical Package for Social Sciences (SPSS) version 23. Qualitative data was analysed using thematic categorization procedures through organising and categorizing data into manageable units and synthesizing them to make meaningful patterns. Content analysis was then carried out to identify the main themes that emerged from the responses. Descriptive statistics such as frequencies and cross tabulations were also used to summarise the information and check for inconsistencies.

2.5 Limitation

While Artisanal and Small-Scale mining is practiced in all ten (10) provinces, this study covered only Six (6) provinces however, the coverage is extensive enough to provide the national picture. For some sites, collection of quantitative data was a challenge partly due to the lack of records especially on monetary values as staff with this information were not available during field visits. Time was the equally a major constraint given the geographical areas covered. Data collection for each project site was conducted within a week due to financial constraints associated with logistical aspects. To ensure the creditability of the information collected, quantitative estimations were substantiated based on the secondary data collected from the mining bureau, Mining Cadastre Department and published reports. This was validated and checked for consistency with the results of interviews from mining practitioners and key informants as well as direct site observations.

2.6 Ethical Considerations

Consent was obtained from respondents prior to their participation and the data collected was treated with utmost confidentiality and the purpose of the study was made known to all respondents.

3. OVERVIEW OF THE POLICY AND LEGAL FRAMEWORK FOR THE ASM SECTOR

To regulate and provide a conducive environment for development and thriving of the mining sector, the Government of the Republic of Zambia has over the years continued to attach importance in providing policy directives and legislation aimed at strengthening the legal framework governing the mining sector at both large, small-scale and artisanal levels. Government has made strides in enhancing the regulatory framework for the mining sector through the development of the key policy documents, national plans and legislation.

Government through the 7NDP identifies ASM as one of the key focus areas which when developed, could have enormous potential to contribute to attaining an export oriented and diversified mining sector as well as job creation owing to the number of people involved in the ASM sector.

3.1 Policy Framework

The policy framework governing Artisanal and Small-scale mining is anchored on the Mineral Resources Development Policy of 2013. The policy aims to:

- Promote exploration of industrial minerals for industrial development;
- Facilitate small scale access to finance for the development of the sub sector;
- Disseminate information to raise awareness on occupational health and safety, environmental risks; and provide occupational health and safety guidelines for ASM operations; and
- Collaborate with ASM associations to facilitate the formalization of illegal mining activities by the ASM sector.

3.2 Legal Framework

The Mines and Minerals Development Act No. 11 of 2015 and the Mines and Minerals Development (General) Regulations are the principal laws governing the regulation of both large and small-scale mining. It is important to note that Artisanal mining rights are issued to only Zambians over an area not exceeding (6.68) hectares. However, in line with the Citizens Economic Empowerment Act of 2006, Section (29) (3) of the Mines and Minerals Development Act of 2015 provides that small scale mining rights can equally be owned by foreign nationals provided that they partner with Zambian nationals in either of the following forms of companies on the basis of equity ownership namely; citizen influenced

company, where 5% to 25% of the equity is owned by Zambians while the rest by foreign nationals or if they form a citizen owned company where more than 50% of the company's equity is owned by Zambians while the rest by foreign nationals or lastly, if they incorporate a citizen empowered company, a company whose equity distribution requires that Zambian nationals own between 25% to 50% of its equity while the rest by foreign nationals. Small scale exploration and mining rights are issued over an area not exceeding one thousand (1000) hectares for exploration and four hundred (400) hectares for mining respectively. In other words, any mine located on more than 400 hectares should be reclassified and changed to large scale.

4. PRESENTATION OF FINDINGS AND DISCUSSION

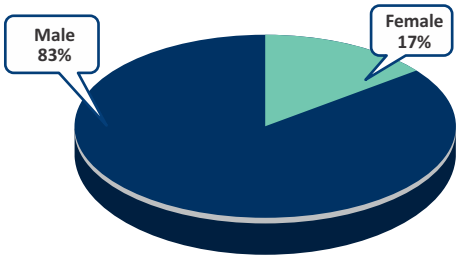
This section presents and discusses the findings of the surveys conducted on various ASM stakeholders located in various districts from the six provinces sampled. These stakeholders included; site owners, site workers, traditional leaders, local authorities and district commissioners.

Figure 2: Manganese mining in Mansa

4.1 Views and Experiences of ASM Site Owners

A total of 35 ASM site owners were interviewed from five provinces namely Central, Copperbelt, Eastern province, Luapula and Southern province. The study found that the majority (83%) of site owners were males whilst only 17% were females as shown in figure 3 below. Most (69%) of these site owners were producing manganese, aggregate and gold while the rest were mining tourmalines, amethyst and silica.

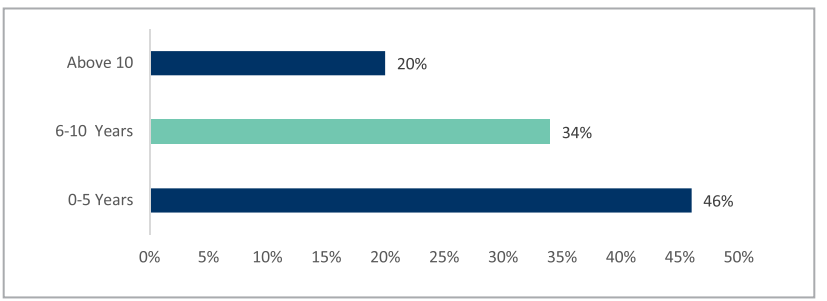
Figure 3: Distribution of site owners by Gender



Source: Field data

Figure 4 below shows the distribution the ASM companies with regards to their years of operation. The study reviews that 46% (16 of 35) of the firms have been in operation for less than five years. This means most of the firms operating in the sector are new entrants who may not have mastered the various rules and regulations governing the sector. This is an indication that most operating firms are still new in the ASM sector and thus need time to grow and develop into stable mines.

Figure 4: Number of Companies By years in Operation



Source: Field Work

Figure 5 below shows how the ownership of the firms surveyed are distributed by nationality. As shown in figure 6, the study found that 94% of the ASM companies surveyed are owned by Zambians and only a small proportion of 6% are owned by non-Zambians. This is contrary to the popular views that most licenses are owned by non-Zambians.

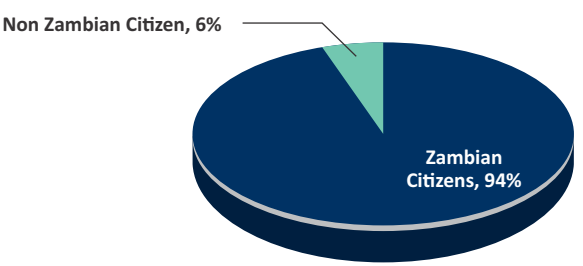
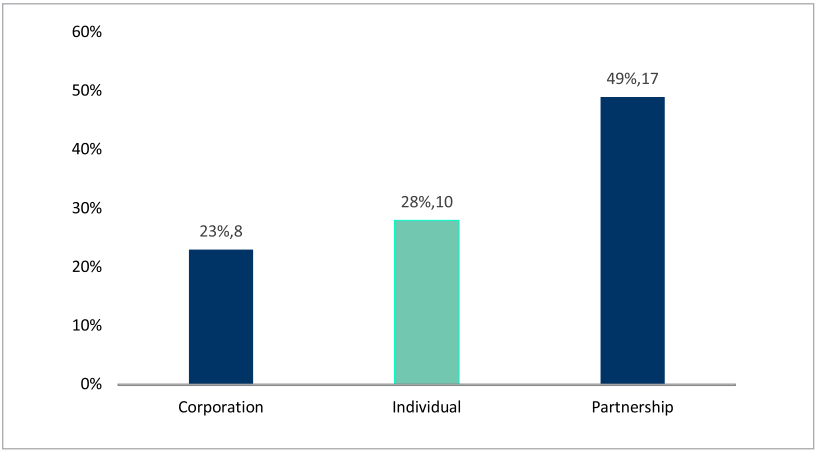


Figure 5: Site Ownership of the firm by Nationality

This study also found that the 77% of the firms operate as partnerships and individuals as opposed to operating as corporations (23%). The survey did not however probe on kind/structure of these partnerships. It can however be postulated that for small scale miners there is a possibility that most citizen owned firms partner with foreign nationals hence the perception that most firms are owned by non-Zambians. This is also an indication that whilst Zambians have mining rights in the ASM sector, they end up entering into partnerships with foreign nationals because they lack the equipment and financial capacity to operate themselves.

Figure 6: Distribution of the Firms by its Legal group

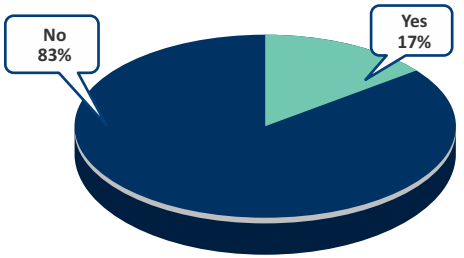


Source: Primary data collected by research team

4.2 Possession of Mining Licenses

In Zambia, it is illegal to engage in mining activities without a mining license. This is regardless of whether someone has land rights to the site where mining activities are being conducted. However, this study found that 17% of the players did not have mining rights. Though the percentage is small; it might be higher with a larger sample of players. Majority of the firms that possessed licenses had Small-Scale Mining Licenses (SML) and Gold Panning certificates. Possession of mining rights is critical as it removes illegalities and enhances access to services offered by Mining Bureaus. It also enables access to services offered by development partners including Non-Governmental Organizations (NGOs).

Figure 7: Possession of Mining rights

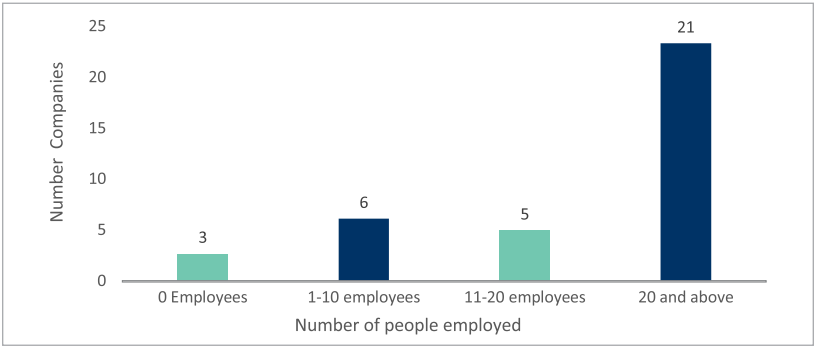


This study found that 19 licenses were not preceded with an exploration licenses as required by mining law. The main reason given was that the law requiring that the Mining rights acquisition be preceded by exploration license came into force after they had already obtained their licenses. The site owners that were mining without licenses revealed that they did not know the procedure of obtaining the mining rights and did not know where to get information on how rights can be obtained.

4.3 Contribution of ASM Site Owners to Employment

One of the aspects which the survey sought to establish was the contribution of the ASM sector to employment. Figure 8 shows that out of the 35 firms sampled, more than half (60%) employed over 20 persons whilst 6 firms employed between 1-10 employees. This implies that firms in the ASM sector has the potential to provide decent employment if well organized and managed. The potential to create jobs in the ASM sector is high because most jobs created are labour intensive with most processes being non-mechanized.

Figure 9: Distribution of ASM firms by number of people employed



The survey probed further on the nature of the relationship between site owners and employees to establish if there were family ties between the two groups. The results showed that most (63%) of the site owners employed relatives perhaps because it is relatively cheaper to employ a relative. Less than half (43%) of the site owners stated that they provided capacity building to their employees mainly in Occupation Health and Safety as well as on operations, how to bench and how to operate machinery.

4.4 Contribution of the ASM Sector to the Economy

Although the ASM sector is known to have potential to contribute to the national economy, the sector is not captured in the National Income Accounts statistics produced by National Statistics Agency (formally known as Central Statistics Office). Hence, it was a challenge to obtain secondary data to comprehensively estimate ASM contribution to national economy. However, this study assessed the contribution of the ASM sector to the economy in terms of its contribution to pensions, tax payment, wages, and also to the local economy where the sites are located.

This survey found that only 17% of the site owners contribute to the National Pensions Scheme Authority (NAPSA) which is an indication that there is a lot of casualization of workers in the ASM sector. This is also a further indication that the social security status of workers in the sector is poor and needs to be improved. With regards to paying taxes, the survey found that 60% of the firms do not pay tax to ZRA as shown in figure 10. As such, the government is losing out on potential revenue that could be collected from the sector to finance development.

Figure 10: Whether the firm Pays Taxes to ZRA

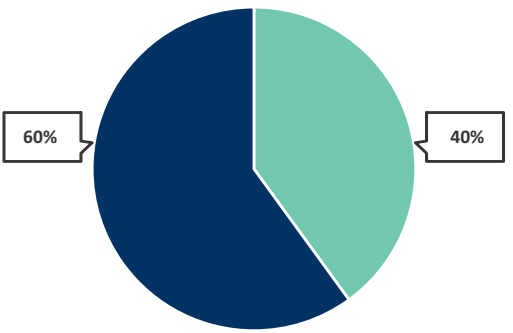
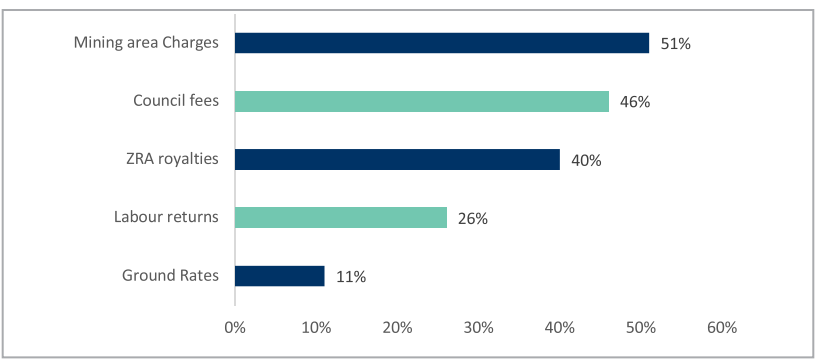


Figure 11: Percent distribution of ASM firms by type of payment to domestic revenue



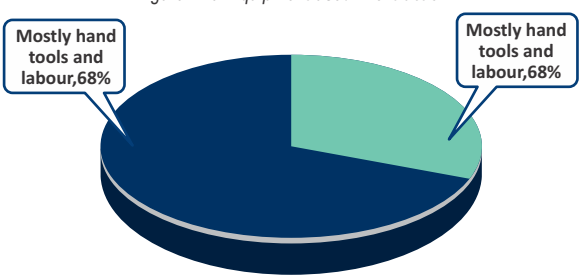
The study found that only 10 local councils out of a total 23 councils sampled receive payments from the ASM sector and the payments are usually in form of Business Levy, Personal Levy, Mineral levy and Cargo levy as shown in table 2 below. This scenario reveals that most ASM activities in the districts are not formalized. It was also observed that some legal entities were not remitting returns to relevant institutions and the main reasons provided included: lack of information on how to go about it (54%), erratic business (23%), not aware of the obligation (15%) and long distance from the payment points. Therefore, there is need to design capacity building and awareness programs for ASM site owners as well as decentralize the systems of remitting various returns to maximize on revenue collection from the sector.

Table 2: Kinds of levies charged by some councils which some ASM firms pay

Councils that Receive payments from ASM.	Kinds of Levy Charged
Mansa, Samfya, Serenje, Mkushi, Chongwe, Lusaka, Luangwa, Chilanga, Ndola and Mufulira.	Business Levy K 5000,
	Personal Levy K 1,500
	Operational permit K800
	Silica levy K 3000 per year
	Mineral levy 100
	Health permit K5000
	Trading permit K 1500.
	Cargo levy K18/tonne (Association member) & K 50/tonne (No member)

Extraction Equipment's used in the ASM sector

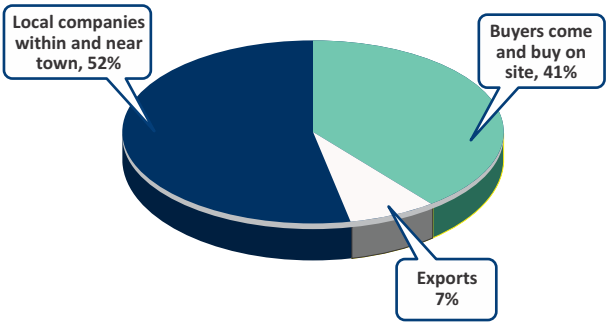
Figure 4-3 Equipment used in extraction



4.5 Market for ASM Commodities

Only few (7%) ASM operators export their mineral commodities to other countries. It's unfortunate to note that most of the mineral commodities are bought by foreign nationals at a very low price. Thus, Government must facilitate the establishment trading centres for ASM mineral commodities as this will prevent exploitation of local people operating in the sector.

Figure 12: Market for mining output



It was revealed that buyers (both licensed and unlicensed dealers) are sometimes not honest as they do not pay for the mineral commodities they collect. Additionally, they buy mineral commodities at a very low price which explains the low revenue generation and low wages in the sector. One ASM site owner stated, "Buyers are sometimes not honest, they do not honor their promise to pay for the minerals they collected. They also buy the minerals at a low price.".

Figure 13: Type of buyer

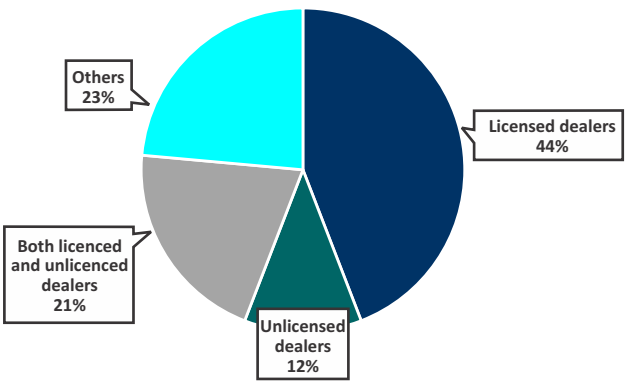
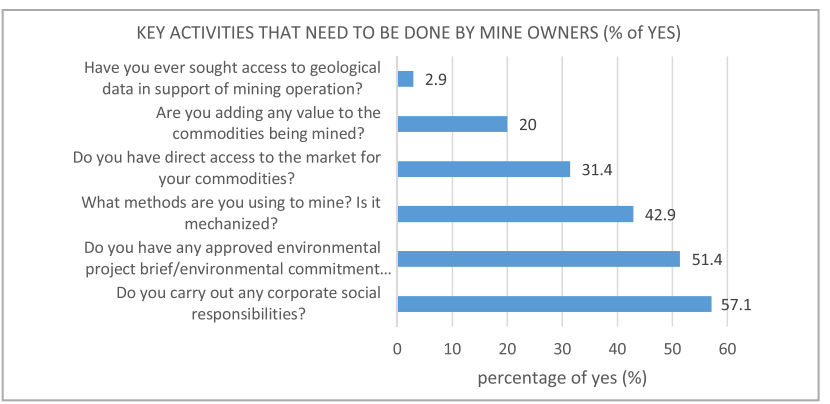


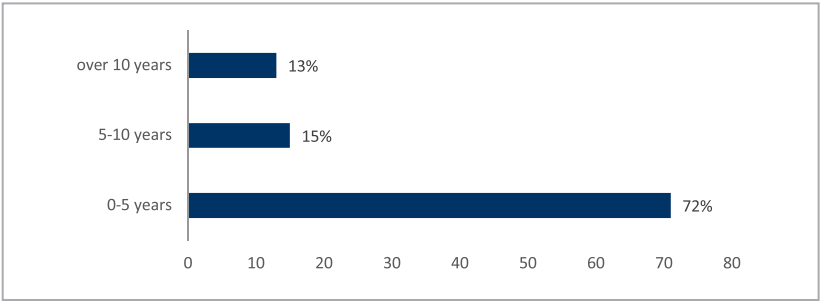
Figure 14: Key activities to be done by mine owners



4.6 Site Workers Perspective

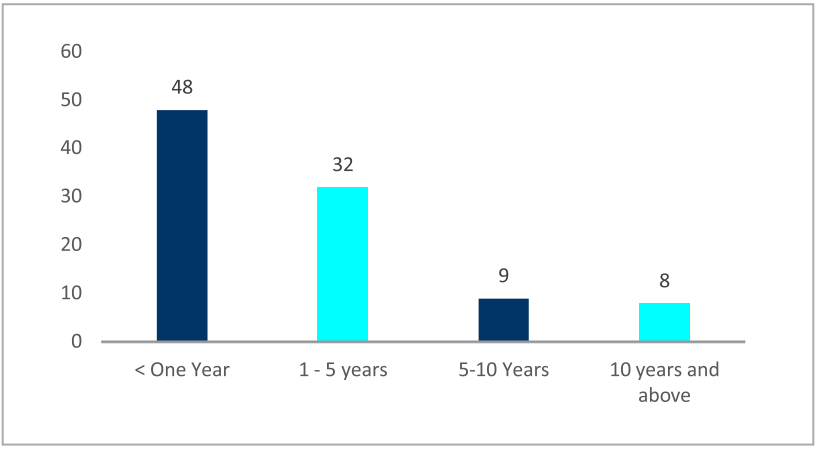
Out of 99 site workers interviewed, majority (72%) of the workers interviewed have less than 5 years' work experience in the ASM sector whilst only 13% of the workers had over 10 years' work experience. This is a clear indication that the sector has a high level of labor turnover due to the nature of the working conditions. Also, this could be an indication of the sector having many seasonal workers who rely on mining activities only when they cannot participate in farming activities.

Figure 15: Distribution of Site workers by their Work Experience in Mining



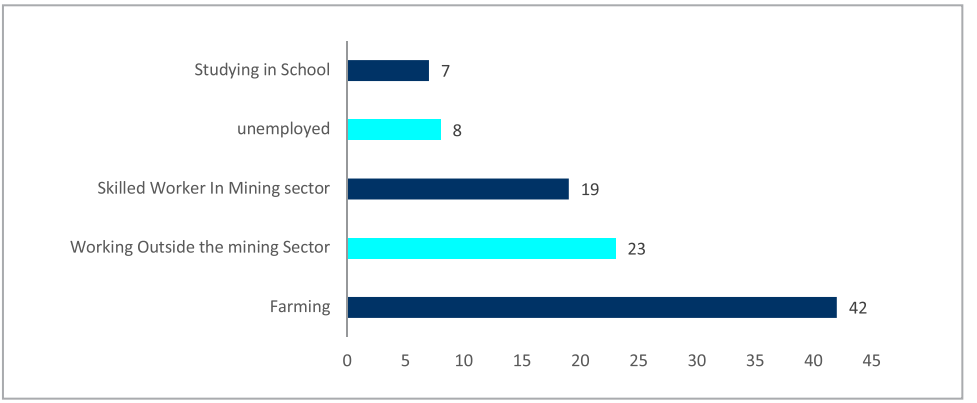
Slightly less than half (48%) of the workers interviewed in their current site had worked for less than 1 year, whilst only 8% had worked at the current site for over 10 years. This is an indication that very few workers work on the same site for a long period of time due to poor and harsh working conditions. Also, the workers that have worked for over 10 years in the same site could have high illiteracy levels and family roots near a mine site.

Figure 16: Distribution of Respondent by Work Experience at Current Work Site



42% of the workers were involved in farming prior to engaging in ASM activities whilst only 7% were studying in school before they became mine workers. 23% worked outside the mining sector whilst only 19% stated they are skilled in mining. A total of 8% were unemployed before joining the ASM sector as shown in figure 17 below. The fact that most workers were involved in farming prior to joining the ASM sector could be an indication that most miners join the sector when their farming activities slow down on a seasonal basis. Also, statistics indicated that very few educated and skilled people join the ASM sector and this could be attributed to the poor working conditions and labor-intensive nature of the sector which explains why most workers in the ASM sector are illiterate and have low level of skills.

Figure 17: Percent Distribution of site workers by their Economic activity before Current Job



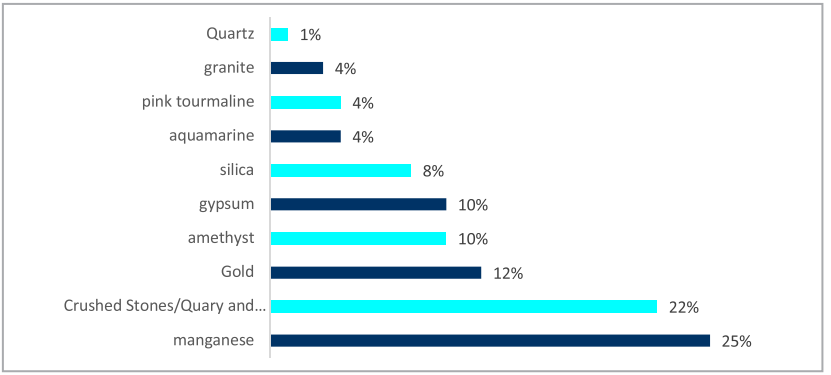
4.7 Drivers to Join the ASM sector and Mineral Commodities

There are several different factors that push individuals into the ASM sector and the most significant of these factors is poverty. A significant proportion of workers stated that their motivation for joining the ASM sector was premised on their desire to have an income to sustain their livelihoods. Others noted that they joined the ASM sector because they were searching for greener pastures and this is despite the sector having poor working conditions for casual workers. This reveals that most people join the sector to improve their standards of living. An interesting point to note is that only 3% joined the ASM sector because they felt they possessed the needed skills to work in the ASM sector which further demonstrates that low levels of skilled workers are in the sector.

This study also revealed that about 25% of the workers (who were in the majority) were working in Manganese mines whilst 22% were working in Quarry and sand mines. A total of 12% of the interviewees were involved in gold mining whilst 10% are involved in Amethyst mining. The least mined minerals amongst the site workers interviewed included granite

and quartz. This could be an indication that most site workers are involved in manganese mining because the mineral is in abundance, easy to mine and more profitable when sold. Furthermore, in some regions, manganese occurs in pockets and veins making it easy extract. Worth noting also is that manganese across the global has in the recent past become on high demand and this could be a reason why Manganese is the most mined mineral.

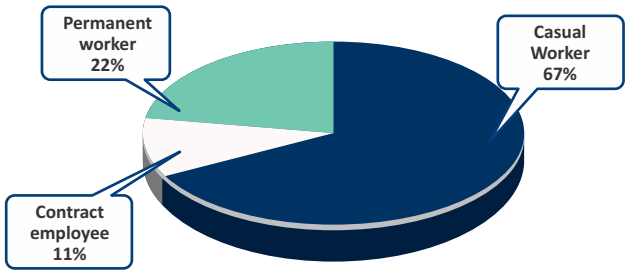
Figure 18: Distribution of Respondent by Type of Mineral Mined at workplace



4.8 Types of Employment

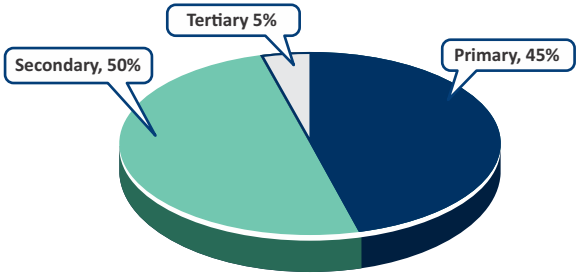
The study also found that the majority (67%) of respondents were employed as casual workers and whilst less than half were employed on a permanent and contracts basis. This is an indication that majority of the workers in the ASM sector are casual workers, which could be as result of the high illiteracy levels which invariably results in a low bargaining power to demand for better working conditions from the mine site owners.

Figure 19: Workers Nature of Employment Contract



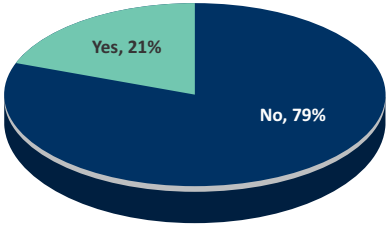
In fact study revealed that only 5% of site workers attained tertiary education. These findings indicate that most workers in the sector are not highly skilled and therefore end up being involved in the labor-intensive activities of the ASM sector which could be a reason that inhibits formalization and the actualization of the full potential the sector must offer to uplift their livelihoods.

Figure 20: Education levels for the site workers



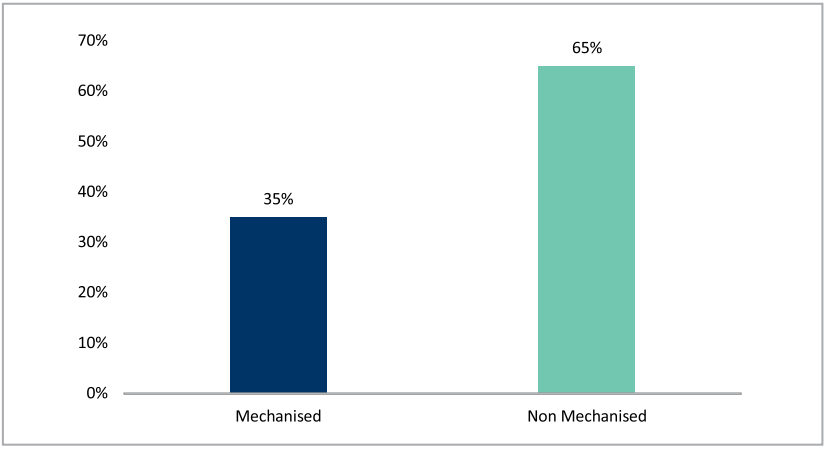
The findings in figure 21 below confirm that the ASM sector is informal because most workers (79%) mentioned that their employers do not contribute to NAPSA. This also speaks to the issue of the high illiteracy levels and the large number of casual workers that are employed in the sector. With the low bargaining power from site workers, the study revealed that mine owners are not compelled to remit their NAPSA payments to promote the social security welfare of their workers. As such, there is need to simplify formalization processes so that mine owners can be motivated to remit to NAPSA and this will ultimately improve the working conditions in the sector.

Figure 21: Distribution of Respondent by whether Employer Contributes to Pension Scheme



Further, study found that a huge proportion (97%) of workers in the ASM sector earn less than K3500. This again reflects the poor working conditions that the casualized workers in the ASM sector have. Also, more than half (65%) of the workers utilize non-mechanized techniques and this points out that the sector is labour intensive, with more manual workers who only offer cheaply their un-skilled labour to the mine owners. Also, non-mechanized techniques employed entails that the health and safety of the workers compromised as workers are constantly in direct contact with the minerals and hazardous chemicals. This maybe because the uneducated workers usually do not demand for safety clothing because they are desperate to earn an income to sustain their livelihoods. As such, most workers continue with the poor working conditions even if it jeopardizes their health and safety.

Figure 22: Distribution of Respondent by Nature of Mineral Extraction at Work Place



4.9 Views and Experiences of Traditional Leaders.

Traditional leaders in Zambia play a critical role in the administration of customary land. Most ASM activities across the country are conducted on land belonging to chiefdoms. Therefore, the importance of Traditional leaders participating in this study could not be overemphasized considering the authority the law (Sec 52 Subsection 1 'C' Cons of Zambia) bestows on them as superintends of customary land. It is worth noting that Six (7) traditional leaders participated in the study and their distribution is shown table 3-3 below.

Table 3: Distribution of respondents by district and province

Province	District	# of Traditional Leader
Central	Chibombo	1
Copperbelt	Lufwanyama	1
Eastern	Lundazi	1
Eastern	Nyimba	1
Southern	Zimba	1
Southern	Monze	1
Lusaka	Rufunsa	1
Total		**7**

4.9.1 The Role of the Royal Establishment in ASM Administration

Four (4) traditional leaders stated that their royal establishments are normally consulted by the existing and prospecting miners on issues pertaining to the ASM sector in their chiefdoms and this entails providing their views on would be mining right holders prior to the Cadaster Department granting them licenses. As a result of their involvement, they have been able to monitor the activities of mining entities thereby ensuring that the interests of the local community are equally taken care of. However, two (2) of the six (7) traditional leaders indicated that they do not play any role in the administration of ASM activities in Zambia. Thus, there was a recommendation from the chiefs on the need for the Cadasters department to strengthen the system of demanding consent letters from the chiefs before the mining license is issued. This is critical in reducing land associated conflicts and ensuring that those with surface rights are properly compensated.

4.9.2 Economic and Social Benefits of the ASM Sector

With regards to economic and social benefits emanating from ASM activities, four (4) traditional leaders revealed that ASM activities had provided employment opportunities for their local community members. Two (2) indicated that their chiefdoms have never benefited from any employment opportunities despite existence of ASM activities in their area. Additionally, even though it is not mandatory for mining companies to undertake Corporate Social Responsibility (CSR), majority of the traditional leaders had higher expectations of mining entities providing CSR in their respective chiefdoms. It was established that four (4) traditional leaders had never received any form of support in form of CSR despite ASM activities taking place in their chiefdoms nor any form of royalty fees paid to their royal establishments while two (2) admitted having benefited from CSR undertakings such as infrastructure development in form of schools, roads and the rehabilitation of their palaces as well as receiving royalty fees. However, concerning royalty fees, it was revealed that the royalty fees received are not fixed and that they are received once a year and not on a regular basis.

4.9.3 Contractual Agreements with ASM

In an effort to contribute to enhancing local economic development, most traditional leaders were of the view that their royal establishments should be entering into contractual obligations with the ASM actors intending to invest in their chiefdoms apart from them providing consent when prospective ASM players apply for mining rights. Traditional leaders were of the view that they could contribute towards enforcing the realization of some of the promises ASM players commit to in their business development plans for the benefit of the local communities if contractual agreements exist between the royal establishment and the ASM players. It was found that only Two (2) out of the Six (6)

chiefdoms had contractual obligations with ASM Site Owners while the rest had none, thereby, rendering them toothless in enforcing or following up on some of the plans as stated in ASM business development plans.

4.10 Regional Mining Bureau Perspective

Regional Mining Bureaus (RMBs) are extension offices of the Ministry of Mines and Minerals Development (MMMD) based in the various provinces. The RMBs were established to enhance decentralisation, taking the services of MMMD closer to the mining communities, thereby promoting efficiency. The RMBs are designed in way that all the technical departments in the ministry are represented in each province.

Four (4) RMBs were visited and the study found that each one of them was carrying out regular inspections to see to it that the ASMs are mining according to mining regulations. The study also established that apart from helping to resolve land disputes that arise, the Bureaus are also providing operational technical support/advise to mining parties, and sensitization on the mining act and regulation.

One RMB officer said, "besides providing extension services, we regulate, inform and sensitize ASMs as well as encourage them to acquire mining rights/licenses".

The existence of the RMB has provided some opportunities in the region for ASM activities. For example, it has made miners easily access mining information from the central government by reducing the distance and time. Furthermore, RMB plays a pivotal role in resolving land disputes between the holders of mining rights and holders of surface rights. It is important to note that under section 57 of the Mines and Minerals Act of 2015, it is compulsory for the holder of the mining right to compensate the owner or lawful occupier of the land. However, in the ASM sector the compliance to this legal provision is very weak, hence the need for RMBs to strengthen their monitoring and sensitisation programs.

4.10.1 Challenges Faced by RMBs.

This study also established that RMBs faced numerous challenges which include the following:

- Limited technical staff,
- Low and intermittent operational funding,
- Low capacity building for the existing staff,
- Poor information flow from MMMD Headquarters to RMBs on the on-going development projects and activities,
- High levels of informalities in the sector resulting in a challenge for regulation/ formalisation,

- Lack of appointed mine managers by the Mine Safety Department at most of the ASM sites,
- Traditional leaders not complying with the Mines and Minerals Development Act when awarding mining rights.

4.10.2 Role of RMBs in Promoting ASM Formalisation

The study found that despite their operational challenges, RMBs play a vital role in promoting formalisation of ASM activities by encouraging the formation of cooperatives in their regions as well as in the sensitizing of ASM players on the requirements of the mines and mineral development act 11 of 2015 and other related legislation. RMBs also undertake routine inspections in areas with active ASM activities to enhance compliance as well as linking ASM players to capacity building opportunities like for example the ACP-EU Development Minerals Programme.

4.11 Mining Cadaster and Geological Department Perspective

4.11.1 Mining Licensing

According to the Mines and Minerals Development Act of 2015, the Mining Licensing Committee (MLC) has the mandate among other things to approve the application of mining rights, including that of ASM mining licences. The committee is comprised of: Director Mining Cadastre, Director Geological Survey, Director of Mines, Director of Mining Safety, and representatives from other institutions responsible for environment, land, finance, labour as well as representative from the Office of the Attorney General, Zambia Development Agency and Engineering Institute of Zambia.

As of August 2019, the Mining Cadastre register showed that there were 1,666 active Artisanal and Small-Scale mining rights in Zambia. Under section 34 of the Mines and Minerals Act of 2015, the duration for Artisanal mining licences is 2 years and 10 years for small scale mining. The current high number of active ASM licenses shows a growing interest from the public to venture into ASM mining activities. In terms of the geological survey, the government has in the past offered support to some ASM players by providing geo-science data in areas where ASM is prevalent. This support was provided under the auspices of a project called Advisory services to small scale miners. However, the provision of support to the small scale miners under this project was faced with funding constraints which ultimately led to the halting of the support programme.

Currently, the geological survey department provides support in terms of information on a demand basis at a fee to any prospective or active ASM player. The government has instituted a number of measures to encourage the public to venture into licenced ASM activities. Notably, the legislation was amended to also include a requirement for the public engaged in ASM to consider forming cooperatives. The formation of cooperatives

has enabled the government to offer extension support services to the ASM players in an organised manner as they are able to reach a large number of players in a given location. The government also has an affirmative policy that provides for low ground rent charges to holders of ASM licences.

The government has further simplified the licencing procedures by waiving some of the requirements that were initially there for someone to apply for a licence. Currently, there is no requirement for a prospective applicant to demonstrate financial sufficiency. The government has also included support services in various districts through the RMBs. However, it has been noted that compliance levels among the ASM players have not been up to standard. This is partly because of the limited capacity by the Ministry of Mines and Minerals Development to monitor the various activities of the ASM players.

The geological survey department also faces constraints in terms of access to up to date information returns by the ASM players as they hardly submit reports to the Ministry of Mines and Minerals Development. The unavailability of funds for monitoring visits by geologists to ASM mining sites has hampered the ability of the geological survey in building a robust data base with latest information on the ASM sector. The department has relied on desk reviews and satellite imagery to monitor the activities of the ASM especially those related to environmental compliance albeit remotely. This has made enforcement of regulations on the sector a huge challenge for the department.

5. POLICY AND REGULATORY FRAMEWORK ON ASM FROM THIS STUDY PERSPECTIVE

The study found that the current legal framework is adequate to effectively superintend over ASM related matters. However, there was a general feeling by most ASM players that Government should put in place, deliberate policies aimed at promoting the development of the ASM sector particularly in the areas of taxation and finance. Most ASM players were of the view that a separate tax regime specifically tailored to cater for the ASM sector would encourage them to formalize their operations as the current tax regime treats them equal with mining companies operating on a larger scale. This is perceived as a deterrent to formalization by most illegal miners. Additionally, some ASM players bemoaned the lack of deliberate policies supporting access to finance to recapitalize their businesses.

Further, the study established that in some instances, customary law and the provisions of the Act are at variance when it comes to the issuance of mining rights. It was found that some chiefs provided consent to unlicensed miners without following the provisions of the Mines and Minerals Development Act in the issuance of mining rights thereby culminating into an increase in the number of illegal miners.

Overall, the study found that the legal framework is adequate in addressing legal matters related to the ASM sector and that most formalized ASM players are adhering to the requirements of the Mines and Minerals Development Act as evidenced by an increase in the percentage of site owners adhering to the requirements of the law governing the ASM sector. However, it was revealed that there is still need to strengthen the regulatory framework by introducing deliberate policies and measures aimed at enforcing legislation such as routine inspections by the Ministry of Mines and Minerals Development to ensure that players fully comply with the provisions of law and sensitize illegal miners on the importance of formalizing their operations. Most local authorities do not have deliberate systems of collecting revenue in form of levies on some ASM activities such as quarrying despite this activity being rampant in their respective towns. (9%) of the District Commissioners equally expressed concern over the lack of effective measures enforcing the collection of levies from most artisanal players in their districts who are mostly illegal. For instance, the District Offices in Kabwe, Kitwe, Chongwe, Chipata and Mumbwa indicated that they do not collect revenue from the illegal ASM players in their districts thereby, depriving the nation of revenue through unpaid taxes. Most District Commissioners were of the view that deliberate tax policies that will not discourage the ASM sector from formalization be developed alongside efforts in formalizing the sector.

6. CONTRIBUTION TO THE ECONOMY

6.1 Contribution to the National Economy

In Zambia Artisanal Small-Scale mining is often carried out informally hence it was not easy for this study to get specific, and comprehensive data on the contribution of the ASM sector to the macro-economic indicator such as Gross Domestic Product (GDP) and total export earnings. This challenge is also attributed to poor record keeping and data management relatively because the majority of players in the sector are not very educated and lack training in data management. In fact, this study estimated that only 5% of ASM players attained tertiary education. This could be an indication of why the ASM sector mostly utilizes simple and non-mechanized tools which do not require technical staff with technical knowledge.

It must be noted that most of the statistics, discussed in this section is a combination of the study findings and those officially reported which may not capture statistics from illegal ASM operations. The study revealed that the 40% of ASM firms contribute to national revenue through mineral royalty payments and 51% pay area charges to the Ministry of Mines and Mineral Development. The 60% of legal ASM firms surveyed which are remitting tax is a clear indication that ASM formalisation that is focused on provision of the legal framework and issuance of ASM licenses is not effective in improving contribution to the domestic revenue. Therefore, in order to succeed in transforming ASM into a viable sector capable of contributing enormously to economic development, formalization must exceed regulations and licensing but holistically address issues that reflect the needs and nature of the ASM sector.

For instance, most ASM players (Site owners) that were interviewed in the study pointed out that with formalization, they expect an improvement in accessibility to credit facilities, markets and mechanized mining equipment, however, with these aspects missing, there is limited incentive to remit taxes such as turn over tax.

It is also worth noting that out of the 35 mining firms surveyed, the majority (60%) employ on average over 20 people. These findings confirm an earlier survey done by Lungu (2007), whose results showed that regardless of its illegal status and associated socio-economic and environmental problems, artisanal mining has the potential to contribute to economic development. Not only does it provide employment to many people, it also contributes to a country's revenue base, and provides mineral export base. However, it was observed during site visits that the kind of jobs in the ASM sector are usually casual (67%), characterized by lower salaries ranging K 1- K1, 500.

The study also established that most employers do not contribute to any pension scheme such as National Pension Scheme Authority (NAPSA). This is evidenced by the fact that 82% of the site workers said that their employers do not remit their NAPSA contributions and this could be because most of the ASM activities are not formalized. These results also indicate that the government is not adequately collecting the mineral royalties, levies and taxes from the ASM sector because a huge proportion of the mining operations are done by unlicensed Artisanal miners and local councils and Zambia Revenue Authority seem to have limited capacity to control and collect required tax revenues from the sector. A well designed ASM formalization strategy would enable the Zambian government to broaden its revenue base. For example, if the ASM firms are formalized, it would be eligible to remit the 'pay as you earn' taxes for all its employees and other taxes hence contributing directly to government's tax revenue base.

6.2 Contribution to Local Economy

It is evident from the study findings that there are benefits derived from the Artisanal Small-Scale Mining activities in local economies and these benefits include employment creation (formal and informal) and source of incomes. This income plays a critical role in helping local families meet their basic needs (Food, Health, education and Shelter). "The income I get from mining has helped me in meeting the general household needs and the paying of School fees for my children" Said a site worker from Southern Province.

The study also found that the income earned by workers is also reinvested in other sources of livelihood such as subsistence farming and charcoal burning which stimulates other small businesses in the surrounding communities. However, the study established that the jobs are not sustainable as ASM operations are seasonal. Further, the wages paid in the ASM sector are too low to help workers sustain their households and escape the poverty trap.

The study also revealed that local authorities receive insignificant revenue from the ASM sector in the form of property, business and mineral levies and the lack of a structured contribution of the sector towards the local economy has been hampered by the large number of informal players in the ASM sector. In most cases, the players do not honour their statutory obligations such as payment of taxes, fees, and rates among others. Therefore, legalizing and enforcing small-scale mining, implementing sector-specific legislation and incentives has significant potential to foster revenue generation for local councils to finance provision of socio-economic services such as the construction of roads, schools and health facilities at community level.

7. ACCESS TO GEO-DATA

Geological data is important in the planning of business in mining. Proper understanding of the geology reduces the risks of missing the target as well as reducing environmental degradation. The Geological Survey Department is mandated to acquire geological data and it is the repository institution for all geological information. The institution has provided access to the data to the public through different dissemination activities and platforms. Members of the public are encouraged to visit the institution to access the data in different formats and preliminary geological data has been put on the Ministry of Mines and Mineral Development online portal. The Geological Survey Department is in the process of developing the database for different mineral commodities which will be accessible by the public. The institution in collaboration with other cooperating partners have developed a handbook for the ASM sector in Zambia which will enable the ASM players to have a basic understanding and knowledge on mining procedures to follow when acquiring a mining licence/right. The ministry is thus collaborating with partners to ensure that ASM players access the geo data through site dissemination of the data so that its easily accessible even to communities in the rural areas.

A case can be cited of Lundazi and Mansa where most ASM players complained that distance limits them from accessing geo data and the Regional Mining Bureaus which are the closest to the mining offices do not have adequate data on the geology of the areas. Most of them explained that they are unable to access online data due to limited access to internet facilities thus the less educated needed hard copies of geo-data. The miners interviewed suggested that the ministry should collaborate with the academic institutions to develop short courses meant for ASM to have some understanding and basic knowledge and skills in Geology and Mining. An example can be cited of a case of the miners in Luapula where complaints were made about them having limited data on the manganese they have been exploiting and also mentioned that most of the data found was too complicated to be interpreted. Other challenges cited on access geo-date by ASM players include:

- Long distances to the central institution with geo-data
- Unfriendly dataset which cannot be easily interpreted
- Ancient Price of data package too high for ASM players to purchase

8. SOCIAL AND ENVIRONMENTAL EFFECTS OF THE ASM ACTIVITIES

8.1 Social Effects of ASM Activities

In as much as the ASM sector has brought to the fore some economic and social benefits to the local communities, most participants, including traditional leaders disclosed that ASM activities in their areas have contributed to escalating adverse social vices such as the violation of children's rights, including right to education. This is because most households opt to undertake mining as a household thereby, depriving children an opportunity to go to school by involving them in mining.

The study also found that there were land disputes emanating from ASM activities. These disputes are usually between mining licenses holders and those with surface right and mostly associated with land encroachment and displacement. In fact, some traditional leaders revealed that it had become increasingly challenging for their chiefdoms to coexist with mining entities operating in their chiefdoms as land disputes bordering on geographical boundaries of the mines and chiefdoms were prominent disputes which existed. This has in some cases resulted in displacements of some households without compensation to pave way for the mineral license holders to commence mining. It was established that most of the people are displaced without compensation. These disputes were mainly attributed to the lack of involvement of Chiefs in the issuance of ASM mining rights in their jurisdictions. Further, unless the surface right holders are fairly compensated and clear demarcation of boundaries are established, the disputes are likely to increase.

8.2 Environmental Effect

The impact of the ASM activities on the environment have been numerous. These range from land degradation such as unburied ditches, deforestation to displacement of animals from their natural habitation. In some cases, the ASM activities such as uncontrolled excavation have resulted in ground water pollution. Further, poor solid waste disposal at ASM camps has resulted in the pollution of the environment including water bodies around the mining sites.

Three (3) traditional leaders and key informants reported that due to the booming of the ASM sector in their respective areas, they experienced a number of challenges associated with ASM activities, including rampant land degradation such as unburied ditches which possess a danger to the safety of the community members especially children and women. Table 4 below shows the environmental effects of ASM activities in percentages terms as per the study findings:

Table 4: Environmental Impact

Environmental Impact	Percent
Air pollution (e.g due to Dust, smoke, fuel)	95%
Degradation of soil and landscapes	69%
Noise Pollution	45%
Deforestation	42%
Damage to visual amenity	29%
Poor waste and rock disposal	29%
Negative effects on local Agriculture	29%
Water Pollution	29%
Loss of Biodiversity	20%

The Government has in the current legislation provided for a requirement for ASM mining rights holders to conduct environmental impact assessment reports to be approved by the Zambia Environmental Management Agency (ZEMA). These reports also outline key mitigation measures that the ASM players need to undertake to reduce the effect of their activities on the environment. The government has also set up an Environmental Protection Fund (EPF), where all mining license holders are required to contribute to. This fund acts as an insurance for environmental liabilities that are incurred through mining in general. However, this study found that compliance to the law especially by ASM operators has been very low. In fact, almost all players in the ASM sector do not comply at all to the environmental compliance requirements. It was observed that the monitoring and evaluation on the adherence to environmental regulation by MMMD and ZEMA is weak. This may be attributed to the fact that the two government institutions are poorly funded to conduct adequate and regular monitoring visits of ASM activities.

Figure 23 : Unburied pits after ASM activities in Lusaka

8.3 Health and Safety effects

The World Health Organization (WHO) defines health as "a state of complete physical, mental and social well-being and not merely the absence of disease and infirmity." Health is not "an objective for living but a resource of everyday life." Poor health generates a vicious cycle and exacerbates poverty levels. Arduous work, combined with inexperience in mining and lack of knowledge about chemical exposures, can further exacerbate the potential for injury or illness; thus, the cycle of ill health and poverty is perpetuated.

Some of the pronounced health and safety issues associated with ASM activities as shown in table 28 below, include:

- ***Injuries and death,*** usually resulting from rock fall due to poor benching, limited workspace, obsolete equipment, and inadequate pit ventilation in deeper pits. The exact rate of accidents is difficult to determine due to the secret nature of most ASM activities.
- ***Respiratory diseases*** (Lung disease) this was mainly attributed to dust emanating from mining activities as Artisanal Small-scale miners rarely have safety kits and clothing material.
- ***Increased Malaria risks*** because pits associated with ASM mining create stagnant waters which are suitable breeding grounds for malaria carrying mosquitoes.
- ***Diarrhoea diseases*** attributed to drinking contaminated water. It was reported that access to safe drinking water is a challenge in ASM mining communities.

Table 5: Health impact on ASM sites

Health Impact	Percent
Injuries from slips & other mining activities	63%
Respiratory diseases	34%
Repetitive strain syndromes	26%
Work related stress	20%
Sexually Transmitted Diseases	17%
Skeletal/muscular disorder	17%
Lifestyle diseases(e.g. heart issues)	11%
Infectious diseases	11%

9. GENDER DIMENSION IN THE ASM SECTOR

A woman crushing stones in Kitwe using a hammer

Gender, as applied in this study, refers to the behaviors, attitudes, values, beliefs, that a socio- cultural group considers appropriate for males and females (Hinton et al, 2003). Gender is an important consideration in development because it's one way of looking at how social norms and power structures impact on the lives and opportunities available to different groups of men and women. Globally and nationally more women than men live in poverty and lack opportunities to get out of poverty. If the impact on the development of the ASM sector is to have a wide-ranging impact, it is critical to look at the gender dimension of the sector.

Over 40 percent of women make up the workforce in Africa's ASM sector. WMMF (2000) contends that women usually play a much larger role in artisanal mining than in the large-scale mining sector. Statistics on the involvement of women derived from country surveys commissioned through the Mining, Minerals and Sustainable Development initiative are shown in Table 7

Table 6: Women in ASM in selected countries

Country	Health Impact	Percent
Africa		
Burkina Faso	45,000 - 85,000	45%
Ghana	89,500	45%
Malawi	4,000	10%
Mali	100,000	50%
Mozambique	18,000	30%
South Africa	500	5%
Tanzania	137,500	25%
Zambia	9,000	30%
Zimbabwe	153,000	50%

Evidence from several studies indicates that there are differentiated impacts of the ASM sector on women and men, with women bearing the largest brunt because they are more negatively impacted by their participation in the sector. This is an expression of the existing gender inequalities that are deeply entrenched in the patriarchal system that reduces the status and authority of women in relation to men. As such, women relative to men are differently affected by the economic, social, environmental realities present in the ASM sector. Despite women in Zambia constituting a large percentage of the workforce in the ASM sector, very few women compared to men meaningfully participate in the different stages of the value chain (Artisanal & Small-Scale Mining Handbook for Zambia, 2018).

Narrowing down to this study, findings reveal that only 17 percent of women own mine sites in the ASM sector compared to men at 83 percent. This confirms that ownership of ASM firms in Zambia is male dominated with major sector related decisions made by male mine owners to favour themselves and the male site workers. Another deduction from this is that male owners make majority of the decisions to represent the women mine owners which is not representative of the women involved in ASM. There is therefore need to increase the number of women mine owners involved in the sector if the plight of women site workers is to be improved. The involvement of women in Zambia's ASM sector is further hindered by limited education as well as inadequate support because women must fend for their families who are heavily dependent on their labour and paltry income.

The consideration of a suitable work environment at ASM sites is another critical element in that came out in the study. The findings of the study revealed that majority of the mine owners, 63.9% stated that they have no practices in place to minimize the negative impacts on women during mining operations. As such, majority of decisions made by mine owners do not mainstream gender dimensions in their operations to safeguard the working conditions of especially women. Only 5.6 percent of all mine owners noted that they encourage women to participate in sector with the working conditions in place to encourage the respect of women's rights. Additionally, 50 percent of the respondents stated that they did not know what needs to be done to improve the working conditions of women in their mine sites. These are high levels of ignorance in the ASM sector which require immediate attention if the sector is to improve the working conditions of women.

Rudvidzo (2015) notes that there are other key challenges faced by women in Zambia's ASM sector which were also confirmed in the study and include following:

- Critical inaccessibility of capital and financing for the mining operations from mainstream financial facilities
- Inadequate suitable machinery and technology
- Inadequate access to information on availability of mining claims

- Extreme difficulty in acquiring mining licenses
- Lack of geological information on the output capacity of their mines due to a lack of finances for the employment of surveyors/geologists
- Lack of technical know-how of the sector due to unavailability of capacity building opportunities
- Lack of information on the market dynamics including tax incentives
- Labour-intensive unpaid care work in the home that takes up time that could have otherwise been utilised in productive mining activities
- Prevailing patriarchal ideologies that mining is a man's job, thereby obstructing crucial information from trickling down to the women miners
- The gender division of labour in ASM operations places most women in the less lucrative functions, such as sorting, washing and providing auxiliary services, such as catering, the mining site.
- Most women work as part-time workers and are therefore not beneficiaries of some of the benefits that accrue to their male counterparts, who, in most cases, are employed on a permanent basis.

There is need for a well-coordinated gender-responsive approach to empower women and increase their participation at all levels of the ASM sector. Evidence reveals that women are more likely to spend their incomes on family maintenance compared to men, who tend to spend more income on entertainment activities (Rudvidzo, 2015). Thus, empowering them in the sector is key in ensuring better livelihoods at the household level. Furthermore, empowering women mine owners and mine workers in the ASM sector could result in substantial alleviation of poverty. Although women play a central role in many ASM operations, they have frequently been bypassed by financing opportunities. As such, there is need for upcoming empowerment programs to focus more sharply on gender issues by looking for ways to give women more voice and authority in the ASM sector.

Key measures to enhance women participation in the sector:

- There is need to lobby for support of women in mining when it comes to access to finance
- There is need for increased support to train women in environmentally sound mining methods/sustainable mining
- There is need to establish a revolving loan funds for more women to access finance
- There is need to identify markets for women to sell their products
- There is need to push back against the patriarchal and cultural norms that perpetuates injustices
- Sensitisation on women's rights in communities is key for advocacy work.

10. RECOMMENDATIONS

- Enhance capacity of technocrats at MMMD: Strengthening the capacity of the MMMD and Regional Mining Bureau staff is important for effective service provision such as
  - The Geological surveys and mappin
  - Mine planning services, and
  - Metallurgical services
  - Monitoring and Evaluation of ASM activities.

This will require a strong political commitment that the MMMD receives adequate budget allocation, reliable vehicles and additional relevant professionals with appropriate incentives.

- **Frequent and comprehensive collection of ASM data.** The Zambia Statistic Agency should frequently collect ASM information at least every 3 years so as to inform policy and interventions in the Sector as well as bridge the information gap in the sector.

- **Increased support for ASM cooperatives:** instead of working with individual ASMs, Government should work with cooperatives or encourage SSMs operating in any given area to establish one large joint venture company. This would ease the provision of services as well as reduce the incidences of illegality which are often associated with small scale mining.

- **Provide Technical and skill training to ASMs:** The technical training and guide with regard to the mining techniques and processing and safety measures is important in order to reduce mining accidents and increasing production in the sector.

- **Providing easy access to financial assistance.** Government to facilitate access to credit for procurement mechanized mining equipments and environmentally friendly processing equipments. Government through ZCCM-IH should also consider establishing an equipment finance leasing scheme for the ASMs. This will ensure that the SSMs have ownership of the equipment and thus exercise greater responsibility.

- **Decentralize the granting of ASM licenses at affordable fee.** This will enhance efficiency in issuing of mining rights and enable more individuals and firms operating illegally to formalize their operations. Additionally, MMMD to strengthen collaboration with Royal Establishments and local governments (Councils) when issuing mining licenses. This crucial in reducing land disputes.

- **Sensitise Zambians on the provisions of the Mines and Minerals Development Act of 2015 and Mines Regulation of 2016,** including the process of acquiring the Artisanal and Small-Scale mining right.

- Introduce a **positive discrimination against men** in the awarding of Mining License to increase the number of women holding mining rights.
- **Value Addition to Mineral Commodity:** Government must facilitate capacity building of Artisanal and Small-Scale miners to add value to their mineral commodities. There is need to also establish value addition facilities in local areas with mineral resources. Local initiatives to develop value- added processes in the production and marketing chain of gemstones, through lapidaries and jewellery manufacturing is critical in improving the export earnings. In addition, Government through ZCCM-IH should consider participating in value addition activities such as cutting and polishing of gemstones as well as processing of mined ores on behalf of ASMs.
- **Establish export markets:** government must facilitate establishment of export markets for ASM mineral commodities. This will prevent exploitation of people operating in the sector.
- **Enhance contribution to Environmental Protection Fund (EPF).** The Mines and Minerals Development Act requires that mine operators contribute to the EPF in form of cash as well as other forms of security. This fund acts as an insurance for environmental liabilities that are incurred through mining in general. Thus, MMMD should enforce this provision and penalise active ASM operators not contributing to EPF. This will compel the developer to execute environmental and social impact statements in accordance with the Mines and Minerals (Environmental) Regulations. It will also provide protection to the Government against the risk of having the obligation to undertake the rehabilitation of mining areas where the ASM licence holder fails to do so.
- **ZEMA to strengthen collaboration with the Royal Establishments and Local Government** by sharing the Environmental Impact Assessment Reports. In other words the EIA reports for specific firms should be in public domain. This will facilitate monitoring of the ASM firms with regards to its adherence to the environmental regulations.
- **Undertake frequent exploration to identify mineral deposit sites** -due to insufficient of geological information, miners are scrambling here and there considerably wasting their time, energy and wastage of land. Therefore, there should be more studies conducted to to identify and delineate ASM sites so that miners become more efficient and land be rescued from severe damages.

11. CONCLUSION

It is undisputable that Artisanal and Small-Scale Mining is an important source of employment, livelihood and income for many local people especially for those living in abject poverty. Additionally, it has enormous potential to positively contribute to the social and economic development at national and individual level. As established by this study the mineral resources and precious stones extracted in this sector include Gold, Emeralds, Manganese, Amethyst, Copper, Tungsten and Tantalum. Thus, if well formalized, regulated and monitored, the government can collect substantial tax and royalty revenues, including export earnings. It is estimated that there are more than 30,000 Artisanal small scale miners in Zambia and about 9000 (30%) are women.

Despite the actual and potential socioeconomic benefits, currently the sector does not contribute significantly to national revenues and foreign exchange earnings. Further most of those employed in the sector are amongst the poorest and most marginalized members of society such as women and children. This is because the sector is not well formalized and regulated. Mining in this sector is labour intensive, characterized by use of low-tech and with poorly trained and uneducated casual workers who are given very low wages. The trade system highly exploits vulnerable individuals and groups. In addition, the licenses holder do not adhere to the requirements in the Mining Act. For example, the majority of the people who are displaced due to ASM activities are not adequately compensated and in most cases not compensated at all.

Other adverse effects of these unregulated and uninspected ASM activities, include environmental- and health-related problems that undesirably impact human quality-of-life, making it almost impossible for vulnerable groups to escape the poverty trap. In other words the current situation in the sector is full of illegal practices, by both licensed and unlicensed miners and does not benefit all Zambians. This is unacceptable and should be stopped. Therefore, the government and other key stakeholders should work hard to stop illegal Artisanal and Small-Scale mining and enable the sector grow into a viable business. As such, there is need to strengthen the inspection, recording, and monitoring and evaluation of the whole ASM sector. This calls for strong political commitment of the government. The recent cancellation of over 800 active licenses holders not complying with the law is a step in the right direction.

However, it is also important to note that formalisation that is focused only on issuance of ASM licenses is not effective in improving the ASM contribution to the domestic revenue and sustainable socioeconomic development. Therefore, in order to succeed in transforming the ASM sector into a viable sector capable of contributing enormously to sustainable economic development and poverty reduction, formalisation must exceed regulations and licensing and holistically address issues that reflect the needs and nature of the ASM sector.

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