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Examining the Challenges and Opportunities for Artisanal Miners in Mt Darwin District, Zimbabwe

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Abstract
The study aimed at examining challenges, opportunities and enabling strategies for the development of artisanal and small-scale miners (ASM) and their communities in Mount Darwin District, Zimbabwe. The study employed a descriptive qualitative design. The 8 research participants were purposively selected from the Mount Darwin prominent artisanal miners and community leaders. The data collection methods included interviews, document review and direct observation. The study found that ASM face challenges such as lack of necessary mining equipment, lack of access to electricity, have poor financial credit facilities, lack expertise, lack of progressive legal framework, lack of relevant institutions and environmental challenges. The research revealed that proper functioning of ASM may lead to economic growth, employment creation, increase in level of production thereby improving the livelihoods. The study recommended the use effective policy formulation and implementation, improving administrative and legal framework issues, creation of mining learning institutions and use of technology. Future researchers should deal with the transformation of artisanal and small-scale miners into companies or cooperatives.
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1. Introduction

Broadly speaking, 'artisanal mining' is described as mining by individuals, groups, families or co-operatives with minimal mechanisation, often in the informal sector of the market (Hentschel, Hruschka and Priester, 2002). Artisanal miners are mostly found in developing countries such as Africa, Oceania and Central and South America (Perks and McQuilken, 2016). Evidence abound that developing countries produce more than 60 percent of the world's minerals despite the fact that these countries are under-explored and less mechanised (World Bank, 2013).

Zimbabwe is located in the SADC region and shares its border with South Africa to the south, Mozambique to the east, Zambia to the north and Botswana to the west. Zimbabwe gained its independence from the British Colonial Settlers in 1980. During the colonial era, the mining industry was developed in a different way from neighbouring countries by the then national bourgeoisies, which comprised a very small group of settlers. Since 1923 the settlers had effective control of the government culminating in a typology of development akin to South Africa than any other country in the region. The imposition of sanctions by the British Government following the unilateral declaration of independence by the Rhodesian Government from Britain in 1965 had a profound effect on the development of the economy through coercing national self-sufficiency in a large variety of products. The advent of independence in Zimbabwe in 1980 brought about inclusivity in the mining sector as blacks are also given the opportunity to venture into economic activities (Perks and McQuilken, 2016).

Consequently, the new government of Zimbabwe introduced a new form of doing business in the mining sector aimed at bridging the gap that existed between the whites and the blacks. In an endeavour to address that imbalance, the government of Zimbabwe included Artisanal and Small-Scale Miners (ASM) as a vehicle for social and economic development particularly the disadvantaged communities that were excluded from participating in the national economy. ASM provide alternative economic opportunities for the majority of the people in rural areas of the country (Buxton, 2013).

Artisanal and small-scale miners are generally referred to as subsistence miners who are not officially employed by a mining company, but work independently, mining minerals using their own resources. They are mainly characterised by the minimal use of machinery or technology; operating with or without legal mining title or valid contract with the title holder; low productivity; inadequate safety measures; healthcare and environmental protection; high seasonality linked to economic insecurity (Marowa, 2013).

In this regard, it is therefore important to distinguish between artisanal mining and small-scale mining as the two activities share many characteristics to the extent that in some usages, the terms are treated synonymous and are used interchangeably. Artisanal miners are usually individuals or family members involved in very small-scale manual mineral extraction without legal mining title, whereas 'small-scale miners' usually have legal mining title and their operations are large and more mechanised (Hentschel et al., 2002).

Although there is an improvement in the ASM as they are slowly adopting technology and specialised

equipment, most of the rural miners are lured into purchasing obsolete technology and are ill-informed of the new transitions in terms of technical knowledge on sustainable development, mine planning and design techniques due to rudimentary mining principles still in use. It is important to realise that the potential growth of the economy has also been affected by rapid environmental degradation caused by artisanal miners (Buxton, 2013).

Some people have argued that the major factor that attracts people into ASM is poverty (Hilson & Potter, 2005). Furthermore, it is argued that ASM is a poverty driven activity, which is capable of alleviating economic hardships and promoting wealth creation largely in rural areas (Funoh, 2014). The poverty trap is largely a result of low levels of technology and technical expertise including poor geo-prospecting, which normally lead to low productivity and recovery of mineral ores as well as negative environmental and health impacts. When people are exposed to poor health combined with bad working conditions, this lead to low returns and subsequently high levels of poverty (Perks and McQuilken, 2016).

The use of obsolete equipment and lack of proper mining knowledge has resulted in hundreds of artisanal and small-scale miners dying in flooded and collapsing mines which are trapping miners underground (Hilson & Potter, 2005). In some cases rocks fall and block escape routes and toxic gases suffocate the miners in poorly ventilated mines. Efforts should be made to ensure that the operations of the artisanal and small-scale miners are safe (Funoh, 2014).

The blacks in Zimbabwe were not allowed to own a mine before the advent of independence. Soon after the attainment of the independence the government allowed those who were prepared to enter into the mining sector to register with the appropriate ministry. This development witnessed the mushrooming of artisanal and small-scale miners culminating in numerous people engaged in the mining sector without the requisite equipment for both mining and rescue operations. This study is therefore aimed at examining the challenges and opportunities available for the artisanal and small-scale miners in an endeavour to improve the operations of the mining sector.

This is premised on the notion that Zimbabwean government since independence in year 1980 pursued a path aimed at developing the economy through empowering its people by encouraging them to establish businesses in various sectors of the economy. Numerous people especially in the rural areas embarked on farming and mining activities; informal and formal mining ventures were established but only an insignificant number of these miners have managed to meaningfully develop their lives and grow the economy.

2. Research Methodology

This research utilized a descriptive qualitative design where the analysis of data was verbally presented with a view to obtain information that is comprehensive. The qualitative method was adopted so as to acquire in-depth information in relation to the challenges, opportunities and strategies concerning the developing the ASM in Mt Darwin District of Zimbabwe. The population of the study included all the artisanal miners in Mount Darwin, and community leaders such as chiefs, councilors and village heads in Mount Darwin District. The researcher used purposive sampling to select 8 community leaders and prominent artisanal miners, because they are usually aware of the achievements and failures of the artisanal and small-scale miners in their localities. Data collection methods used included interviews, document review and observations (Quinlan, Babin, Carr, Griffin & Zikmund, 2015). This study used unstructured interview guide in order to elicit data in respect of the informal and the formal artisanal and small–scale miners.

3. Results and discussion

After carrying out the research concerning ASM in Mt Darwin District, Zimbabwe, using interviews, documentary analysis and direct observation the researchers came out with the following research findings.

3.1 Challenges faced by Artisanal and Small-Scale Miners

3.1.1 Mining equipment

A significant number of ASM are resident in the rural areas of Zimbabwe. The majority of these miners uses obsolete and antiquated equipment and lacks the requisite expertise to professionally discharge their duties. Most of the equipment used by the ASM include picks, shovels, dynamites and hoes, which are basic tools that cannot give maximum output to the user. In this vein, the ASM operations realize meager income which culminate in unsubstantiated mining operations. This development has got a negative impact on investment while a substantial amount of money is required to purchase the requisite equipment and meet family demands. To this end, the miners are left with no option but to use the meager income to meet social needs thereby ignoring the opportunity to invest or expand the business ventures (Fritz, 2017).

Lack of adequate equipment in respect of prospecting and exploring results in ASM erratically producing limited amounts of minerals from uncertain reserves. In the same vein, this results in inability to conduct long term planning and adequate mining development (Perks and McQuilken, 2016).

Fritz (2017) further states that the need to critically analyse challenges generated by lack of adequate equipment in an endeavour to assist the artisanal miners is very important since they are vital cogs in economic

development. Lack of adequate equipment such as drilling and pumping machines also leads to miners abandoning their deposits prematurely once hard rock or water is encountered. When artisanal and small-scale miners encounter hard rock and cannot afford to acquire dynamites they easily abandon the area and start somewhere. When there is water in the mine, a pump is required to remove the water so that mining activities can be pursued.

Lack of adequate equipment also leads to environmental damage due to continuous movement from one place to the other. When the pit gets to about thirty meters dip, the normal practice is to move away and start another pit. This continues to take place in most areas where gold is being mined. Not only has the land suffered but also the fauna and flora.

3.2.2 Lack of access to electricity

Electricity connection requires some procedures to be followed, time required to complete the procedures and the amount of money to be paid before connectivity. It is understood that high costs are incurred daily during the operations of mines and these include the purchase of cell batteries and head torches including using generator or fuel driven machine. Though electrifying the mining areas obviously increases production, the cost of installing electricity is often very prohibitive especially to the artisanal and small-scale miners (World Bank, 2020).

Zimbabwe is facing a critical shortage of electricity as it struggles to provide this indispensable amenity to both business entities and households. In 2018, the deficit in the provision of electricity prompted the government to embark on a substantial number of projects poised to ameliorate the situation. Resultantly, it is anticipated that numerous projects being pursued by the government have the capacity to provide the requisite electricity megawatts sufficient for the country.

It is imperative to realise that even with modern mining technology the use of electricity cannot be dispensed with. In view of this, electricity should be availed to succor economic development.

3.2.3 Poor financial credit facilities

In Zimbabwe ASM rarely have the opportunity to access funding from banks due to lack of collateral security, hence they have to dispose their assets and meager savings to start mining operations. The Reserve Bank of Zimbabwe made an amendment to the Banking Act Amendment number 12 of 2015 promulgated in 2016 to pave way for the establishment of the Credit Registry at the Reserve Bank of Zimbabwe.

In the same vein, this development includes licensing and supervision of private credit bureaus by the Reserve Bank. The World Bank (2018) made a close analysis of the credit facilities available in Zimbabwe and revealed that there is need to improve in order to provide the requisite impetus to grow the economy (World Bank, 2018).

Furthermore, lack of collateral security and informality has also demonstrated to be the greatest impediment for small-scale miners to access capital. Most of the small-scale miners do not have properly registered claims. In this regard, they also lack the capacity to keep vital records such as employment or labour records, accurate or up to date financial records. A significant number of these miners do not have even bank accounts (World Bank, 2019).

3.2.4 Lack of expertise

ASM lack the requisite training for their day-to-day operations. Most of the ASM are rural people whose knowledge in this field is limited and require assistants from people with the relevant skills. In any economy, the growth of a particular industry requires a collective effort by both government and stakeholders (Buxton, 2013).

Lack of proper education and guidance to establish and operate mining ventures results in loss of life since there is no training in respect of the work performed by the miners. Most of the rescue operations require well-trained personnel to ensure effective, efficient and professional discharge of such duties is achieved. A lot of mines have experienced these mining accidents and most of them can be attributed to lack of knowledge on the part of those engaged in mining activities (Buxton, 2013).

The prevalent accidents experienced by the ASM include trips or falls, being hit by machinery or a moving object, and cave-ins or rock falls. There is lack of technical expertise in geological stress analysis in underground mines, leading to more unpredicted rock falls. Even where the miners introduce mechanised equipment and techniques, complementary safety measures are commonly overlooked (UNDP, 2011).

There are also risks that are associated with exposure to dust (silicosis); mercury and other chemicals; the effects of noise and vibration, poor ventilation and over exertion; inadequate workspace, and inappropriate equipment. The procurement of protective equipment such as helmets and dust masks through to guarding shields in front of operating blades may be cost prohibitive for ASM (Funoh, 2014).

In addition there are other health issues including poor sanitation, and lack of clean water, malaria, typhoid, dysentery, tuberculosis, sexual transmitted diseases (including HIV/AIDS), malnutrition, and substance abuse. These conditions in most cases can reach epidemic proportions when makeshift camps arise for rush mining (Funoh, 2014).

3.2.5 Legal issues

Generally, in most countries in the Sub-Sahara Region, men and women possess the same rights regarding the ownership of property. Challenges arise when the man who is the registered owner of the mine dies leaving the wife and children. In some cases it may be automatic that the surviving spouse or the eldest son in the family

becomes the heir. Even in places where the law of the land is specific that the surviving spouse should inherit the assets of the deceased, in practice this may not be possible as people continue to stick to traditional practices (Fritz, 2017).

3.2.6 Lack of relevant institutions

The ASM require institutions such as shopping centers, learning institutions and hospitals in areas they operate. These infrastructures are very essential, because in their absence, the social malcontents, such as prostitutes, drug peddlers and criminals frequent the mining areas masquerading as vendors resulting in some health hazard conditions emanating from their activities. In most cases there are no hospitals some people are tempted to use wrong traditional medicine in the mining areas and chances of contracting deadly diseases are very high (Chigumira et al,. 2014).

3.2.7 Environmental challenges

The major challenge created by the ASM in their places of operations is land degradation and open pits. Land degradation is the result of human-induced actions, which exploit land, causing its utility, biodiversity, soil fertility and overall health to decline. Mining operations routinely modify the surrounding landscape by exposing previously undisturbed earthen materials. Erosion of exposed soils, extracted mineral ores, tailings and fine material in waste rock piles can result in substantial sediment loading to surface waters and drainage ways (Barrenechea, 2016).

The mining taking place in Mt Darwin represents all methods of gold extraction from deep underground mining to ASM, which mines only a few metres deep, through large-scale alluvial mining and the most infamous gold panning. It is evident that the area is affected by the environmental impacts of each of these mining methods. Each of the gold mining methods being employed has environmental impacts that one needs to be aware of always. Their difference might be the extent of the impact from one method to another. There are a number of impacts but the following constitute the most prevalent ones; water resources degradation, loss of biodiversity with emphasis on flora, dust pollution and effects of small-scale gold mining (World Bank, 2013).

Issues related to the exact nature of water resources degradation that would involve laboratory analysis of water samples had not attracted the attention it deserves. It is imperative to note that issues of ground water depletion and changes in soil properties have not been given the requisite priority by the authorities (UNDP, 2011).

3.3 Opportunities available for ASM

3.3.1 Contribution to economic growth

Abundance evidence pointing to ASM's contribution to economic growth is available and is nationally acknowledged and defining the future. Mineral producing countries in most cases produce higher economic growth rates than those economies that do not depend on resource extraction. Subsequently, the development of mining sectors is certainly an important contributing factor to rapid economic growth in Zimbabwe. Beside Zimbabwe and other few mineral economies, growth has been attributed exclusively to large-scale industrial mining with its capacity to generate revenues through exports and taxation. Should ASM be brought to contribute to annual growth rates, more revenue could be brought into the national economy (Fritz, 2017).

Taking into consideration the great importance of the human resources of artisanal and small-scale miners in the rural context, the potential beneficial contribution of ASM to sustainable development is very high.

3.3.2 Employment creation

A research recently carried out by the International Labour Organisation (ILO) revealed that about 13 million people across the globe are directly engaged in small-scale mining activities throughout the world. It also disclosed that the livelihoods of close to 100 million people are affected by the activities of the small-scale miners. It is disturbing that there is lack of clarity over the actual number of people currently employed by this sector. A myriad of factors make it difficult to ascertain the actual extent of employment; the informality of the sector; lack of official statistics; and number of seasonal and occasional workers. Despite the difficulties encountered in this sector, it is evident clear that ASM is an important employment-generating sector (UNDP, 2011).

3.3.3 Levels of production

The contribution of ASM to mineral production can be increased significantly as enunciated by the ILO that small-scale miners accounted for approximately 15 to 20 percent of the world's non-fuel mineral production. The volume of minerals produced by the ASM varies between countries and between operations within countries. The Zimbabwean Herald of 19 April 2022 states that ASM produced 54 percent of the total gold amassed in Zimbabwe in 2021. Despite low levels of production by individuals, the often large numbers involved means that on a national scale total production can be significant, in some cases equaling or exceeding that produced by large mines (UNDP, 2011).

3.3.4 Improving livelihoods

According to Fritz (2017), ASM is often poverty driven and located in rural areas. These are generally unskilled and they receive low levels of income. Individuals are sometimes involved in artisanal and small scale mining activities due to a myriad of reasons. However, the most important thing is to ensure that ASM does not create

problems for the community but should create an environment conducive for poverty alleviation and sustainable development (Buxton, 2013). When a significant progress is registered, the common tools for the ASM sector can be implemented, as follows:

- Organisational and legal support,
- Access to prospective land,
- Training,
- Dissemination of best practice,
- Micro credits and other development instruments.

According to UNDP (2011), the vital point to make here is that the ASM if properly resourced and empowered make significant contribution to sustainable economic development, thereby improving the livelihoods of the society. Recently the UN Department for Economic and Social Affairs developed an interesting sustainable livelihood approach for artisanal mining communities, which is being implemented in countries such as Mali, Ethiopia, Ghana and Guinea. The policy recommendations for this approach are as follows:

Mainstreaming poverty eradication into national policy making in all sectors including the mineral sector;

- Promoting small-scale mining as a catalyst and an anchor for other productive activities to stimulate the development of complementary and alternative productive ventures necessary for sustainable poverty alleviation (Chigumira et al, 2014);
- Placing people first through both pro-poor strategies and participatory methodologies aimed at strengthening the organisational capacity of grassroots communities therefore favouring a bottom up approach (Chigumira et al, 2014);
- Reversing the focus from hands on state intervention to the creation of private enterprises including for services especially micro enterprises or cooperatives (Chigumira et al, 2014).

3.4 Strategies to be employed to ensure effectiveness of ASM

3.4.1 Policy Formulation and implementation

The need to come up with a pro-development policy cannot be overemphasized and therefore, government should come up with policies that promote poverty alleviation, optimisation of the business climate for the artisanal and small-scale miners, insurance of sustainability and stabilisation of government revenues from the sector (Chigumira et al, 2014).

3.4.2 Administrative and legal issues

The sector should ensure that government would capture more revenue from the ASM once legislation legalising the sector takes care of the negative social and environmental effects. Nevertheless, there are numerous reasons why artisanal and small-scale miners are interested in operating within the informal sector. A number of small miners lack knowledge of the legal requirements exacerbated by demanding bureaucratic procedures often required to be part of the formal operation. In 1980 Tanzania implemented mineral trade liberalisation policy to formalise ASM sector, which increased the legally traded gold from

USD $0.55 million in 1985 to USD $38.78 million in 1992 (UNDP, 2011). In this regard, formulation of the relevant policies and their proper enforcement is very vital to ensure the desired objective is achieved (Barrenechea 2016). Furthermore, according to Buxton (2013) the administration of the mining sector needs to be decentralized to ensure it becomes an instrument to guarantee proximity of services. The integration of the ASM sector into rural development in an endeavour to avoid conflicting interests should prompt the mining authorities to coordinate the activities of the local administration and communities.

3.4.3 Institutions of learning

The establishment of mining learning centers may assist to provide learning information to artisanal and small-scale miners. New technology is being used in most countries around the globe hence the need to conscientise the small-scale miners with the aim of improving their productivity. The increase in productivity gives impetus to revenue generation. The learning centers should serve as sources of information dissemination and aid on all-important issues related to the legal, fiscal, institutional and administrative framework of the sector (Barrenechea, 2016).

More importantly, the learning centers can help the informal groups of miners to become formalised and to effectively control the activities of the sector. The learning centers should have the capacity to promote and build the image of the sector, thereby assisting both government and the private sector to access foreign markets for the benefit of the country (Buxton, 2013).

Outreach programmes can be initiated to help develop the existing economic structures and provide sufficient support to the ASM. Efforts can be made to improve methods of gold recovery as well as addressing environmental and health issues. Learning sessions can be conducted to discuss the dangers of mercury and delve into various methods of burning amalgam (Barrenechea, 2016). Miners can also be educated on how to recycle mercury, save money and reduce health risks associated with using mercury. Numerous learning programmes can be put in place

to assist ASM in environmental protection and promote safety issues (Barrenechea, 2016).

3.4.4 Technology

The ASM the world over, have to a limited extent used technology hence their productivity is very low. Most of the problems bedeviling the artisanal and small-scale miners are technologically related and require technologically related solutions. It is imperative to realise that the frequent mention of mercury emissions from artisanal and small-scale gold miners require technological solutions. In most cases technical solutions can only be implemented by changing some of the framework-conditions, which can be crucial for interdisciplinary (Buxton, 2013).

4. Conclusion

Based on the research findings and discussion it can be concluded that,

There are a myriad of challenges that are being faced by the artisanal and small-scale miners such as: insufficient and antiquated equipment; lack of expertise; lack of access to finance; complexities of legal and administration issues; and environmental problems. However, there are a lot of opportunities for ASM, which include the following among others; contributing to economic growth, creating employment opportunities, improving levels of production, and improving livelihoods. Strategies to ensure the above-mentioned opportunities can be exploited and sustained include: giving impetus to policy formulation and implementation in respect of poverty alleviation; legalising informal miners and decentralising the administration of mining activities; creating institutions of learning; and acquisition and use of technology. Future studies may further look into mining activities for specific minerals such as gold or diamonds so as to compare if there are any differences on the challenges, opportunities for ASM. It is also necessary to consider the challenges and opportunities for incorporated and licensed mining companies in the country so that synergies can be created with ASM if there are any advantages.

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