

The economic contribution of artisanal and small-scale gold mining in Uganda: a case of Mubende and Buhweju districts

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Introduction and Background

Small-scale mining is often used interchangeably with artisanal mining, with acceptance that there is no consistent global definition for the terms. Broadly, small-scale mining refers to the exploitation of marginal or small deposits of minerals by individuals, groups or organizations with minimal or no mechanization. Small-scale mining (SM) is one of the emerging economic activities providing alternative livelihoods globally with more than 13 million artisanal and small-scale miners and about 150 million people indirectly reliant on it (ILO, 2003).

Mining is an important economic activity that underpins the livelihoods of many people worldwide. In Sub-Saharan Africa, the focus has traditionally been on large-scale mining of oil, gas and mineral resources that have tended to benefit the elite, often adding very little value to the sustainable growth of economies (Collier, 2010).

In Uganda, Artisanal and Small-Scale Gold Mining is on the increase and is largely a poverty-driven activity used as a coping mechanism with thousands of local communities currently engaged in the mining practice (MEMD, 2011). The communities in the mining sites live in deplorable sanitary conditions, use toxic chemicals such as mercury in the gold extraction and have severely degraded fragile ecosystems that support their livelihoods (NEMA, 2012).

Uganda has recently made mining one of the government's top three priorities

in the Second National Development Plan; and in rural Northern Uganda, several studies have attempted to address the acute insecurity and recurring conflict over access to pasture, land ownership and minerals, hindering economic development. For example, Karamoja is one of the most richly endowed regions with over 50 different minerals including gold, silver, copper, iron, gemstones, limestone and marble. Although 97 per cent of the land is covered with exploration licenses, anecdotal evidence suggests that the scale of exploration work being carried out is inconsistent with the number of concessions and a large number of licenses are non-performing. The majority of Karamoja people still live in chronic poverty despite enormous mineral resources (Hinton, 2011).

In Karamoja, studies are inconsistent on the actual number of workers currently engaged in small-scale mining, though estimates range from 18,000 to 20,000. As conflict in the region is finally subsiding, government is developing significant interest in the potential revenues from Karamoja's mineral wealth. However, in the absence of robust data, the scale of existing operations (licensed and unlicensed) and likely future of small-scale mining to promote inclusive and sustainable economic growth cannot be predicted and remains largely speculative (Hinton, 2011).

Unfortunately, the Government of Uganda still regards ASM as an illegal practice, and has not provided a regulatory and policy framework to guide the mining operations. The absence of evidence-based strategies for sustainable ASM exacerbates the situation (MEMD, 2012). While there is a growing trend of community engagement in artisanal small-scale gold mining practice in pursuit of livelihoods security, the associated challenges remain unabated and these continue to affect the incomes from the mining activities.

Despite the growing concerns regarding the economic contribution of artisanal and small scale gold mining, there is less scholarly work that critically analyses the micro-level socio-economic aspects. The main emphasis of the available literature has been largely on the macro level characteristics of the sector and there are few good social economic analyses that consider the economic contribution. There is thus a limited attempt to understand whether the engagement in the small scale mining is fact economically viable despite the growing number of people that continues to engage in the practice (Heemskerk, 2002; Walsh, 2003).

The absence of deeper micro level analyses of small scale mining affects the understanding of Small Scale Mining economic contributions. Critical evidence is thus lacking to understand the current economic contribution of small-scale mining in Uganda. It is therefore important to undertake a detailed study to understand

the economic contribution of artisanal and small scale mining. This study should also look at how the sector is formally or informally coordinated; how many and which demographic groups are trapped in the poverty cycle and who, by extension, is benefitting from the sector in its current form. The findings of the study are important in facilitating the policy interventions and other formalisation requirements.

Background

The theories that directly underpin the critical linkages between small scale mining and the associated economic contributions are sparse. Although several scholars have looked at several social economic issues and the benefits associated with small scale mining, these do not constitute distinct theories that form the understanding of the sector's economic contribution. However, a number of theories attempt to create viewpoints that seem to characterize small scale mining. The classical theory of informal sector and that on property rights thus provide the theoretical understanding of small scale mining when viewed from the informality and legalization point of view.

The classical theory of informality recognizes that, the informal sector under which small scale mining is largely anchored, arises from the capital-limited nature of the economic practitioners (Gibson, 1994). The classical theory is based on the notion that informal sector processes are processes which will not return the average rate of profit when evaluated at the prevailing level of wages and prices and will not be operated by capitalists who require the average of return. The theory very well resonates with several scholars who assert that small scale mining is largely informal and often illegal with most communities turning to it as a poverty coping mechanism (Hentschel, 2011, Gibson, 1994, Kelly, 1995).

Under the informality nature, the economies are limited by exogenous level of demand which forces unemployed workers and “unemployable illiterates” to join the informal sector thereby constituting workers who are neither capitalists nor workers but who rather constitute a distinct social class. In some instances, in the short run, the informal sector processes may earn positive or negative profits but in the long run, the implicit wage in the informal sector determines the formal sector wage rate (Gibson, 1994).

Under this theory, if the initial conditions are appropriate, the informal sector will eventually earn the average rate of profit becoming in effect formal but if this case scenario does not suffice, then it is possible that this adjustment path is blocked

so that the model converges to a long-run equilibrium in which both formal and informal sectors coexist.

The theory generalizes that the informal sector technologies are largely rudimentary and labour productivity is characteristically low, overhead or fixed capital is minimal and intermediate inputs, especially imports are not nearly plentiful as in the formal sector if at all they exist. This scenario contrasts with the general understanding that small scale mining is highly rudimentary employing low technological equipment such as hand tools and applying polluting and toxic chemicals chief among them Mercury and Cyanide which are not only ecologically sensitive but have serious health impacts (Hentschel, 2011).

The other theory is that of property rights; Fabian Clausen, Maria Laura and Amir Attaran in a 2011 publication by the Canadian Center of Science and Education provide insights on how the theoretical justification of property rights influences attempts to formalize informal sectors including providing legal regimes for regulating the informal operations such as small scale mining.

Different scholars have several definitions for a property. A property is a legal institution that governs the use of things (Barnes, 2009). Property is viewed by many from a narrow sense of private context; however, it also has social and public dimensions as it provides the means to achieve sustainable development, particularly the social order and the mode of public and economic organization (Singer, 2000). As several scholars assert, the structure of a property system influences how societies are shaped and how people interact and earn a living (Fabian, 2011).

Fabian (2011) further indicates that; how one understands and justifies the existence of a property influences the kind of property necessary to manage certain resources and that, the understanding of property theories has an impact on how much state regulation particularly for the private property is tolerated. The understanding of property rights helps to know who is given what kind of rights over his property, setting requisite rules to govern the acquisition of property, and how conflicts between property owners are potentially resolved (Barreto, 2011). In articulating issues of informal sector and with particular reference to small scale mining, it is important to acknowledge the fact that land rights and ownership dynamics greatly influence the sector. Thus the theory of property rights particularly from the land and economic rights point of view must be explored including efforts to regulate small scale mining operations not only as government policy but also as an economic tool of empowerment.

One fundamental issue is clear in respect to small scale mining by individuals and communities, the fact that all small scale mining operations globally and particularly in Africa, conflict is common practice and as such adequate regulatory solutions must be found to make the sector meaningful. This is entirely because mining is an economic asset and more so takes place on the valued property- the land resource, thus property issues arise in the context of land use. In most cases, miners will not own the land on which the minerals are located. This leads to questions of land allocation, for example if the government should set aside specific lands for Small Scale Mining, and what provisions are made with regards to other private owners of land on which minerals happen to be located.

Thus, from a theoretical point of view, some basic questions underlie all of these issues such as: how much space do governments grant private actors regarding the use of their property, and how much government regulation is acceptable? Or, in other words; how “strong” are the private property rights vested in the respective actors? and how should concerns of property distribution be addressed within the property system itself? (Long, 1995)

It is important to note that over 90% of scale mining practices are not regulated and as such have no secure property rights and do not actually pay any form of taxes. Thus, the first and fundamental question that the proponents of this informal sector should ask is: should we create a formal framework that promotes Small Scale Mining at all, or is informality in fact more efficient?. In order to answer this question, it is imperative to understand the economic implications of small scale mining to justify the rational implications and how defining this would help balance legal-economic requirements (Hentschel et al, 2002).

Hruschka and Hentschel assert that the costs of drafting and disseminating laws, and the possible deterring effects these laws might have for small-scale mining, would have to be weighed against the expected benefits of participation in the law. The prevalent and common trend is that governments prefer creating private property rights as it is always more efficient due to the total wealth it generates, and formality is preferable to informality (Hentschel, 2002). This is particularly true because governments expect taxes and royalties from the formalized miners and reduced smuggling of minerals to neighboring countries as a result of unregulated and informal mining operations (Hruschka et al, 2002). The question one would ask is; if governments prefer formalized structures why has small scale mining remained largely informal?; but as several scholars assert, governments view small scale mining operations as illegal requiring no formalization as miners seemingly have no property rights over the mining land resources (Hinton et al, 2011).

There is an argument in the literature that ‘formalisation’ of small-scale mining operations is necessary to maximize the economic benefits for the poor, however, robust evidence to support this is lacking. In theory, formalisation could provide workers with better access to mineral deposits, equipment and training; resulting in increased productivity rates and reduced negative environmental impacts. Access to markets through more formal channels may also cut out the middle men and increase revenues for the actual workers on mine sites.

However, there are known examples where governments have attempted to formalize small scale mining have tended to favour the elite (similar to large-scale mining), whilst the workers remained highly vulnerable. Contrary to this, there is a school of thought that rather than full formalisation which may not be realistic, some form of commercialization of operations through robust agreements between governments and commercial companies would do more to directly benefit the economy and create jobs. This has raised questions on the realistic benefits and constraints of formalisation or commercialization in different contexts, to improve livelihoods for the poor.

Historical background

The international interest on artisanal gold mining (AGM) has evolved over time looking mainly at; the definitional issues, technical, legal, Gender, Environmental and Social Economic issues and some important linkages that exist (Hentschel et al 2003; Hruschaka et al 2002; Hinton 2011; Bastia, 2004; Chaparro, 2003; WHO 1995; Ibrahim, 2003; ILO, 1998; Carmouze, 2001).

It is important to note that most of the historical artisanal and small scale gold mining episodes evolved in form of “gold rush”. Gold rushes extend back as far as gold mining history, to the Roman Empire, whose gold mining was described by Diodorus Siculus and Pliny the Elder, and probably further back to Ancient Egypt. (Hinton, 2011)

The recent massive involvement of communities in artisanal gold mining operations particularly in Africa is typical gold rush stereotype (ILO, 2012). The gold rush is a period of feverish migration of workers to an area that has had a dramatic discovery of gold deposits. Major gold rushes took place in the 19th century in Australia, Brazil, Canada, South Africa, and the United States, while smaller gold rushes took place elsewhere in the world (Reeves, 2010; Eane, 2009).

Hentschel (2002) notes that despite some level of recognition, implementation of legislation among the mining communities remains problematic and many miners

do not have faith in the ability or commitment of their governments to provide assistance and as a result the miners have depended on the middlemen further exacerbating the situation in the mining operations, a reason it has remained informal.

In Uganda, mining started in ancient times by artisans. Formal mining started with arrival of the British Explorers during the colonial times. Copper, phosphates, limestone and several small- medium mines for tungsten, tin, beryl, niobium, tantalum, gold were operated (1930s-60s). During 1950s-60s, mining contributed about 30% of foreign exchange earnings.

In 1970s, due to political crisis, exodus of skilled man power, economic sanctions and the collapse of the economy, the mining industry collapsed. In 1990s, rebuilding of the nation started but mining sector was not a priority and it was not easy to get back investors. Mining continued on small scales. Then some medium scale mining started especially that of strategic minerals such as limestone for cement manufacture, but precious metals, base metals and others continued to be exploited on small scales and as a result of limited or lack of regulations, artisanal gold mining has recently sprung up in many parts of the country (MEMD, 2013).

The global picture on artisanal gold mining

Artisanal gold mining (AGM) takes place throughout the world, but is particularly widespread in developing countries in Africa, Asia, Oceania, Central and South America (Hentschel, 2003). The global commissioned studies on Artisanal and small scale mining particularly those by the International Institute of Environment and Development (IIED) and the World Business Council for Sustainable Development (WBCSD) in over 20 countries provided a detailed overview of ASM sector with focus on social economic and environmental issues. The studies broadly highlight typical problems of AM related to Geology, Technology, Law, Human Resources, Marketing, Organisation and Financing mechanism but the sector's critical linkages to livelihood security are less explored (Hentschel et al 2003).

There are a number of international efforts and conferences focusing partially or exclusively on improving different aspects of artisanal mining and these include: the Calcutta 1991 conference at the National Institute for Small Mines, the Harare 1993 United Nations conference on important guidelines on small- and medium-scale mining, the Washington 1995 conference by the World Bank on comprehensive strategy towards Artisanal mining, the Vienna 1997 conference on Global Mercury Pollution from Artisanal Gold Mining and the Geneva 1999 Tripartite Meeting on

Social and Labour Issues in Small-Scale Mines (IIED, 2003). However, most efforts have dwelled mainly on the geo-political and social economic environment of the sector with minimal focus on the sector linkages with livelihood security.

The study commissioned by Centre for Development Studies, University of Wales, Swansea assert that geographically, Asia, has the highest number of people involved in ASM but with the least ASM literature, compared to Latin America which has attracted a lot of attention despite the fact that fewer people are engaged in this sector. The centre's review indicate recent holistic studies on ASM, specific ASM aspects, environmental consequences, regulatory frameworks, and other technical issues but food security as a consequence of AGM is less explored (Gilman, 1999; Labonne and Gilman, 1999; Labonne et al., 2001; MIME Consult, 2002; Hinton et al., 2003; Malm, 1998; Veiga, 1997; Veiga and Hinton, 2002, Barry, 1996; Bugnosen, 1995; ITDG, 1990).

The Centre asserts that In-depth studies of Artisanal Mining communities are limited and this is further confirmed in other scholarly materials which indicate that a limited number of micro-level socio-economic studies have been carried out (Hughes and Furamera, 1999; MIME Consult, 2002; Heemskerk, 2000 and 2002; Walsh, 2003). The University further asserts that there are also few studies that capture the linkages between the micro and macro level in terms of the institutions, legal practices and policy processes that serve to exclude or include AS miners in decision-making that affects their lives including their socio-economic wellbeing and household food needs (CSD, 2004). The Centre alludes from the review of AGM scholarly work that the significance of AGM in people's livelihoods and how participation in the sector affects livelihood security and wealth creation including the sector contribution to poverty reduction in different contexts for different groups of people is not well understood (CSD-UW, 2003).

Regional Picture of artisanal gold mining

Artisanal and Small Scale Gold mining (ASM) is one of the emerging economic activities providing alternative livelihoods globally with more than 13million artisanal miners and about 150 million people indirectly reliant on AGM (ILO, 2001). A large proportion of artisan miners mainly in Africa are women and children who are also important in supporting sustainable livelihood security. However, their extensive involvement in the informal mining operations sharply affects other livelihood interventions for which they hold key roles (Hentschel, 2003). In Sub-Saharan Africa, the focus has traditionally been on large-scale mining of oil, gas and mineral resources that have tended to benefit the elite, often adding very little value to the

sustainable growth of economies (ILO, 2003)

'Informal' small scale mining in Sub-Saharan Africa is prominent in poor rural areas where minerals are found. The literature is inconsistent on the actual number of poor and unskilled workers who directly depend on this sector, though estimates are over 4 million. This suggests that unlike large-scale mining operations, small-scale mining potentially offers greater opportunities for both direct and indirect job creation for the poor although these economic benefits are not well documented (ILO,2003).

As economies in Africa strive to develop more sustainable and inclusive models of growth, an emerging evidence base is now recognizing the potential of small-scale mining as an important economic activity in some rural areas and possibly a resilient livelihood choice to generate much needed sustainable wealth for poor people. However, the informal nature of operations has left the sector negatively perceived and largely ignored by governments and the development community in mainstream poverty reduction interventions (Heemskerk, 2002).

Owing to its informality nature, there are, a host of challenges associated with small-scale mining which tend to undo the potential economic benefits. These challenges are well known and have been debated by academics and practitioners for decades. These include weak or absent government policies, persistent structural barriers such as; conflict over land-use and access; poor access to financial services; market information and technology; exclusion of certain demographic groups; poor productivity; unsafe working conditions; uncontrolled migration; low entry barriers to illegal activities and adverse environmental impacts. These and other issues such as child labour, high transmission of communicable diseases and lack of education present major challenges not only to governments, but to the wider development community. As a result, evidence on the economic opportunities from the sector is limited and patchy at best (Hentschel 2002).

There are also a number of known reasons why workers continue to operate informally and lack incentives to seek formal recognition, making the sector even more problematic. Its labour intensive nature requires little skill, capital and technical investment and rewards in cash; making it attractive to poor communities. Knowledge about the legal requirements is also limited, raising apprehension about the demanding administrative processes often required to become and remain a formal operation. Consequently, many workers are exploited by middle men and unable to build upon their productive assets to move ahead economically, leaving them trapped in a vicious cycle of extreme poverty, conflict and vulnerability

(Hinton, 2003)

Many workers who are often most marginalized on mine sites are women. Rather than frontline digging, women are generally tasked with transporting and processing materials, supply of food, drinks, tools and equipment, as well as providing sexual services. Their contributions are difficult to quantify, poorly researched and therefore perceived as trivial by policymakers. Studies have demonstrated that the active participation of women in the sector can bring direct benefits to households through better control of incomes and spending, however, it is often the male head of household who controls the money and women rarely receive a fair share (Hinton, 2003)

There is an argument in the literature that ‘formalisation’ of small-scale mining operations is necessary to maximize the economic benefits for the poor. However, robust evidence to support this is lacking. In theory, formalisation could provide workers with better access to mineral deposits, equipment and training; resulting in increased productivity rates and reduced negative environmental impacts. Access to markets through more formal channels may also cut out the middle men and increase revenues for the actual workers on mine sites. However, there are known examples where governments have attempted to formalize the sector have tended to favour the elite, whilst the workers remained highly vulnerable (Fisher, 2007).

Contrary to this, there is a school of thought that rather than full formalisation which may not be realistic, some form of commercialization of operations through robust agreements between governments and commercial companies would do more to directly benefit the economy and create jobs. This has raised questions on the realistic benefits and constraints of formalisation or commercialization in different contexts, to improve livelihoods for the poor (Verbrugge, 2014).

Studies acknowledge the need to effectively identify and understand the driving forces for people’s participation in the Artisanal and small scale mining in order to guide the requisite interventions. For instance those driven by poverty with declining livelihoods options, are unlikely to countenance saving and investment in new technologies and will target mainly survival in which case, probably social protection programmes or basic health and safety guidelines would be a more appropriate intervention. On the hand, the formalized and legal artisanal mining has higher ability to improve livelihoods and require strengthening through appropriate technologies and strategies (Walsh, 2003).

The National perspective of Artisanal Gold Mining

Artisanal and small scale gold mining in Uganda is on the increase and is being carried out in many of the country. Uganda lies within the African plate, which is a continental crust that contains Archaean cratons that date at least 2700 Ma. The country’s geology endowed with a wide variety of minerals has been grouped into various geological litho-stragraphic domains. Particularly, the gold industry has seen a radical increase in gold production to 7tonnes of gold in 2000, up from 225kg produced in 1994 (MEMD, 2013).

Gold appears to be widely distributed throughout Uganda, but has only been exploited by miners in a few areas near Busia (East), Buhweju and Kigezi (Southwest), Mubende (central) and more recently, Karamoja in the northeast. Most of the gold mined is located in small, high grade alluvial deposits located around the Proterozoic basins such as those in Buhweju. The Busia goldfield is considered an extension of the Lake Victoria Goldfields located in Tanzania. Gold contributes up to 30% of export revenues from Uganda (MEMD, 2012).

Uganda’s gold production has increased largely due to deregulation of gold sales by the Central Bank as well as gold from neighboring DRC being sold in Uganda and mining is currently spread across many parts of the country as indicated in figure 1 below.

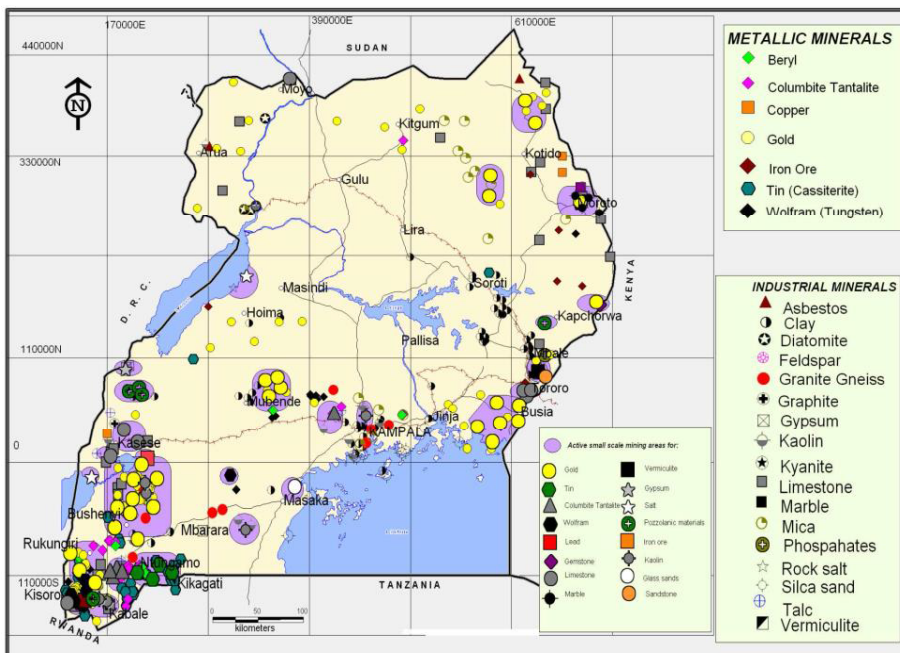


Figure 1: Artisanal and Small Scale Mining Areas in Uganda.

Source: MEMD, 2012

Most gold production in Uganda is by small producers who include licensed miners and artisans. Production statistics from artisan miners is only indicative given the fact that most operators are not licensed and even the licensed ones tend to under declare hence most of the gold is transacted through dubious channels (MEMD 2009).

The sites mined in Uganda have differentiated ecologies ranging from fragile aquatic areas to fertile agro-ecological zones and rocky areas and with the exception of Kisita, Kamalengera, Tira and Amonikakine mining sites, where gold is being recovered from reefs (hard rock), most of the gold is recovered from alluvial material and potential agricultural fields. Particularly, the gold mined in Buhweju is located in small, high grade alluvial deposits around the Proterozoic basin and in the wetland ecosystems making it highly risky to environment and human health (NEMA, 2012).

While gold mining is seen as an alternative livelihoods option, it presents challenges of environmental degradation which further exacerbate the poverty problem to those undertaking gold mining as a poverty coping mechanism. The rapid migration of a large population from the villages in search for gold does not only create environmental challenges but has also severe health and socio-economic risks and the practices have potential impacts on the livelihood security of mining communities (NEMA 2012). The environmental degradation associated with the excavation of large volumes of material in alluvial fragile ecosystems particularly the wetlands has drastically affected the hydrological value of these ecosystems as well as the quality and quantity of water in the areas affected.

In Mubende district, South Western Uganda, there is an influx of over 5000 illegal gold miners in Luginji A and C and surrounding areas near Katugo village in Mudadde parish and in Luginji A and Luginji C villages in Kijuna Parish in Kitumbi Sub County (MDLG, 2013). Although mining is being embraced as an income generating enterprise in these areas, the practice has had far reaching health and ecological implications which in the long run affect the expected incomes from the mining.

Statement of the problem

Artisanal gold mining (AGM) is one of the emerging informal economic activities providing alternative livelihood options to thousands of people in the world with close to 25 million artisanal miners and about 150 million people indirectly reliant on AGM (ILO, 1998).

Thousands of communities in Uganda are currently involved in “gold rushes” with a hope to improve their way of living. However, most artisanal gold mining practices take place in highly fragile ecosystems and agricultural fields with implications on people’s livelihoods and ecology (Hinton, 2011).

There is thus an ecological and livelihood security challenge in Uganda associated with artisanal gold mining practices. Communities in the mining sites live in deplorable sanitary conditions, use toxic chemicals such as mercury in the gold extraction process and have severely degraded fragile ecosystems and agricultural fields that should support their livelihoods. Several reports including the media, have also warned of a looming crisis should the illegal and informal artisanal gold mining practices involving large communities in Uganda continue unabated (MEMD 2009, NEMA 20012).

Further, there are a host of challenges associated with the small-scale mining which are well known and have been debated by academics and practitioners for decades. In addition to weak or absent government policies and regulations, persistent structural barriers such as: conflict over land-use and access; poor access to financial services; market information and technology; exclusion of certain demographic groups; poor productivity; unsafe working conditions; uncontrolled migration; low entry barriers to illegal activities and adverse environmental impacts. These and several other issues such as child labour, high transmission of communicable diseases and lack of education present major challenges not only to governments where small scale mining is common place, but to the wider development community. As a result, evidence on the economic contributions and opportunities presented by the small scale mining is very limited and patchy at best (Hinton, 2011).

While small scale mining is on the rise in many parts of the region, there are still challenges of poor exploitation and lack of proper training among the miners. These poor methods perpetuate low mineral production and incomes while increasing risks associated with environmental degradation, occupational safety and community health and wellbeing. The majority of small scale miners are largely drawn into mining by poverty where they end up using inexpensive and polluting technologies and chemicals such as mercury putting themselves at a risk (Hinton, 2006). This is further exacerbated by the lack of ownership or mineral rights over the mining sites (Hentschel et al, 2001; Hinton et al, 2003c; Baker, 2004).

Being situated in remote regions and often established in an ad hoc manner, the resulting characteristics of many small scale mining communities are also important determinants of health and wellbeing. The influx of cash into a local economy,

combined with a paucity of economic alternatives and a transient workforce often leads to an active sex trade and high rates of HIV/AIDS and other STDs.

In addition, rampant drug and alcohol abuse, gambling, and violence are frequently reported. Further to this, misuse of mining revenues to meet personal rather than family or community needs continues to be an often reported barrier to positive change. Due to the remote location of most of these communities, the speed at which they are often established and the limited resources of governments in impoverished countries, these health and social issues are often compounded by a lack of services and infrastructure.

Despite this artisanal gold mining discourse, there is less scholarly work that underpins its critical implications on the livelihood security particularly discerning whether the perceived benefits in fact make meaningful economic contribution to the wellbeing and livelihood security of artisans. Several scholars have asserted that small scale informal mining practices have potential negative implications to livelihood security and ecology (Ocansey, 2013; Bastia, 2004; Montani, 2002; WFP, 2014; Maxwell 2002; Hutchion 2003; Alisha 2013; Frankenberger 1990).

The study thus set out to examine the economic contributions of artisanal gold mining on the livelihoods of miners in Uganda with a view of making policy recommendations and also contribute to the body of knowledge.

Research Objectives

The main research objective was to examine the economic contribution of Artisanal Gold Mining in Uganda. This was achieved through the following specific objectives:

- ◆ To explore the nature of artisanal gold mining in Uganda
- ◆ Examine the economic contribution of artisanal gold mining in Uganda.

Research questions

- ◆ What is the nature of artisanal gold mining in Uganda?
- ◆ What is the economic contribution of artisanal mining?

Conceptual Review/Framework

This conceptual frame is guided by the Cause-Effect frame work by Corvalán (1999), (Health, Environment and Sustainable Socio-Economic Development) as modified from the framework for the development of environmental health indicators, Briggs, 1996, (linkage methods for environment and health analysis).

This frame work recognizes that the relation between human health, environment and socio-economic development is complex and requires holistic approach to fully address linkages and response mechanisms.

It further recognizes that there is no single best way of organizing and viewing the socio-economic and environment relationship that reveals all of the important interactions and possible entry points for response requirements thus focusing mainly on the driving force, resultant pressure, state, exposure, effect and the actions required. The framework for instance recognizes that although exposure to a pollutant or other environmentally mediated health hazard may be the immediate cause of ill health, the “driving force” and “pressures” leading to environmental degradation may be the most effective points of control of the hazard and this contrasts well with scenario where engaging in artisanal gold mining may have specific driving forces such as poverty, creates pressure on environment and will absolutely create end point effects on the livelihood security. Thus, in order to ameliorate the challenges of illegal/informal artisanal gold mining by the communities, it is imperative to link it to the concept of driving force-pressure-state-exposure-effect model (Cause-Effect Model).

Driving forces create the conditions in which artisanal mining can take place in pursuit of the basic necessities of life (food and shelter). Driving forces may include poverty or policies that determine trends in economic development, technology development, consumption patterns, and population growth. In this particular case, one of the driving forces may be poverty which pushes people into survival mechanisms such as the “informal gold mining” scenario paying little attention to their health, food needs and the need to preserve the environment. The driving force in turn generates different kinds of pressures on the environment, in such forms as waste from human settlements and depletion of agricultural lands or emission of pollutants from the mining operations.

These pressures can lead to changes in the state of the environment, as seen when land use is changed (deforestation or drainage problems) or when discharges of toxic chemicals or other forms of waste increase concentrations of chemicals in air, soil, water, or plants. The changes may have direct or indirect impacts on social economic and environment and consequences such as food insecurity could be a result of this complex interaction. The conceptual framework therefore, highlights the important links between different aspects of society (“the why factor”/driving force), environment/natural resources (resultant pressures), the state, exposure and the possible effects and the desired outcome.

The Nature of Artisanal Gold Mining in Uganda

In Uganda, artisanal and large scale gold mining is one of the emerging forms of environmental degradation being experienced in different districts. The rapid migration of a large population from the villages in search for gold is not only creating environmental challenges but has also severe health and socio-economic risks and the practices have potential impacts on the livelihood security of mining communities (NEMA 2012).

Most gold production in Uganda is by small producers who include licensed miners and artisans. Production statistics from artisan miners is only indicative given the fact that most operators are not licensed and even the licensed ones tend to under declare hence most of the gold is transacted through dubious channels (MEMD 2009).

The environmental degradation associated with the excavation of large volumes of material in alluvial fragile ecosystems particularly the wetlands has drastically affected the hydrological value of these ecosystems as well as the quality and quantity of water in the areas affected. In Mubende District alone, over 10,000 community members are actively involved in illegal gold and kaolin mining. The miners rely heavily on inexpensive, outdated and polluting technologies with high risks to human health and environment (MDLG, 2012). For instance, according to the monitor report of 10th November 2014, twelve people were killed and several others injured when a gold mine at Luginji mining site in Kitumbi sub county, Mubende district caved in. An avalanche of soil covered what was initially a 20 feet deep gaping hole where residents rummage for the gold. Over 3000 artisans are engaged in mining at this site.

The sites mined in Uganda have differentiated ecologies ranging from fragile aquatic areas to fertile agro-ecological zones and rocky areas and with the exception of Kisita, Kamalengera, Tira and Amonikakine mining sites, where gold is being recovered from reefs (hard rock), most of the gold is recovered from alluvial material and potential agricultural fields. Particularly, the gold mined in Buhweju is located in small, high grade alluvial deposits around the Proterozoic basin and in the wetland ecosystems making it highly risky to environment and human health (NEMA, 2013).

The rapid migration of a large population from the villages in search for gold is not only creating potential health and ecological risks but is also a recipe for social economic imbalances such as food insecurity, increased crime rate and prostitution with its related effects (NEMA 2013).

For the case of Mubende, the “gold rush” became more significantly noticed at the start of 2012 although locals have mined gold for decades. The gold rush attracted people from all over the country and from neighboring countries such as Rwanda and the DRC. Now artisanal gold mining is spread across four of the sub counties of Mubende. One of the sub counties is Kitumbi, which has at least nine artisanal mining locations. Three of these locations were visited by the research team; Rubali, Lugginggi I (also called ‘Kampala’) and Lugginggi II. The Rubali artisanal mine was the largest location with huge mining camps and a high concentration of artisanal mining operations. Hard rock ore is found on the mountain and is collected in mining pits, which are on average 30 meter deep. The mountain hosted around 200 large mining pits with several hundreds of trial mine pits. The mining pits had narrow shafts without any safety measures to prevent workers from falling in. Most of the pits were in use and the miners worked in groups of 10 to 20 people to get the hard rock ore out of the ground.

The mineral sector falls under the Ministry of Energy and Mineral Development (MEMD), with the Directorate of Geological Survey and Mines (DGSM) being responsible for the administration and management of the sector. Currently ASM is covered by the Mineral Policy, which was put in place in 2001, the Mining Act, 2003 and the attendant mining regulations established in 2004. The Mining Act regulates the ownership and control of all minerals, and provides for the acquisition of mineral rights. In order to operationalise the Mining Act, regulations were introduced in 2004.

They contain procedures for acquiring the various licenses like: mining lease, export/movement permits, mineral dealer’s licence etc. Historically artisanal mining was viewed negatively (i.e. as disorganized and ineffectual) by government and the public (‘they work like chickens’) and the value of the sector for the country has long been ignored. This has resulted in a Mineral Policy and legislation that does not sufficiently provide opportunities for formalisation of the ASGM sector and in the minerals trade, while in fact ASM dominates the mining industry in Uganda. There is currently no legal framework to accommodate artisanal gold production and therefore regulation does not exist formally; there are no official production figures or export figures. Technically it is possible for artisanal gold miners to legalise their activities through a location licence. This licence is valid for up to two years, but may be renewed for further periods of up to two years at a time. In practice, however, the procedures are not within reach for artisanal miners.

Understanding the Economic Contribution of Artisanal Gold Mining

The study examined the economic contribution of artisanal and small scale gold mining in the districts of Mubende and Buhweju in Western Uganda. An exploratory study design with the principles of epistemological Positivism was used. (Stahl, 2003, Sol & Gonzales, 2012; Wynn, 2001). 384 respondents were selected from artisans, mining rights holders, and local leaders. Data was collected using observation checklists, survey questionnaire, interview guide, and documents review guide. The findings indicated a strong correlation between the variables of interest (artisanal and small scale gold mining and economic contribution) determined using odds ratio and 95% confidence intervals. Several variables such as land utilization as well as safety and health of miners were assessed using the economic lenses to provide a rational understanding of the economic gains from artisanal and small scale gold mining.

Mining Incomes

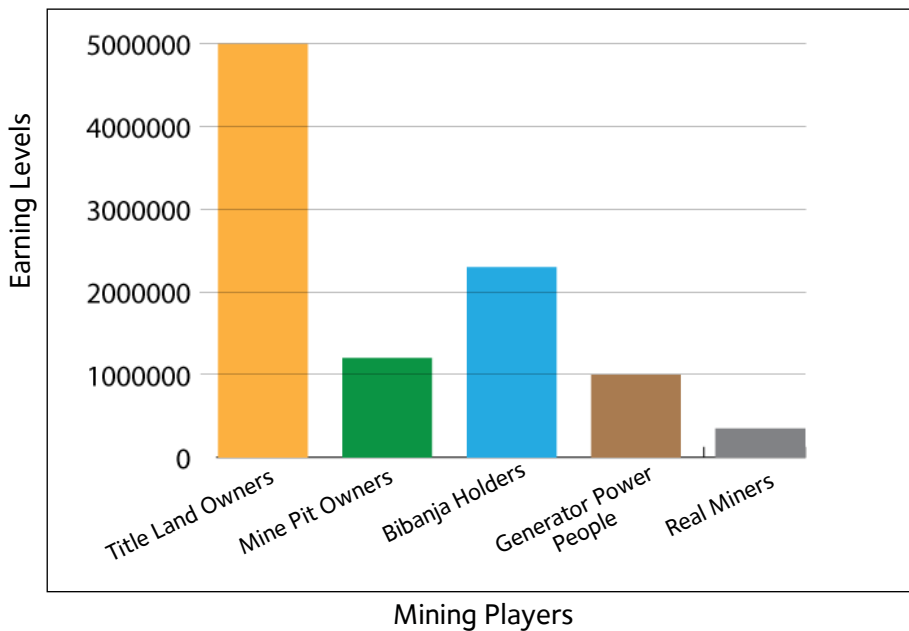
Findings indicate that artisanal and small scale gold mining in the areas studied is largely undertaken with a view to improve the livelihoods. However, vulnerabilities that characterize the practice tend to undo perceived and actual benefits from the mining. This is also in line with other studies which indicate that the ability of artisanal and small scale mining to contribute to the long-term household security depends on a range of factors including; the type of Artisanal and Small Scale Mining being undertaken, whether labour relations are exploitative, the number of household members involved, and relationship to other income generating activities at household level among others. For instance when an entire family is involved in the mining, it may be a survival strategy undertaken as a short-term solution to pressing needs but may compromise sustainable livelihood security of the entire household (Walsh, 2003).

In the study areas, it was established that there are various mining actors in the artisanal and small scale gold mining business with various roles and earning capacities. These include Title land owners where the rush has happened and these earn heavily through renting out mining land although they are at constant war with bibanja owners where the gold rush is taking place. The other group consists of the Mine Pit owners who rent pits from bibanja holders. These own excavation tunnels now at average depths of 400feet below ground.

Then, there are the real miners. These keep dying when the tunnels cave in especially in the rainy seasons and nobody is bothered. A death due to a cave in is considered a good omen. The Makita Drill runners are hired to drill hard rocks many feet

underground. These usually die in underground accidents and cave-in quite often. There are no safety gears and prior mining education for these people. Falling rocks, dust, low oxygen and electric shocks work against them. This group undertakes the real mining but does not make meaningful earning from the risky operations. There are then the Generator Power people who supply power lines that light up all the camp houses and the tunnels plus the makitas (mining equipment). This category is mostly dominated by men as it is an abomination for women to go into the pits. These also earn better than the real miners who are at the bottom of the earning scale as indicated in Figure 2 below.

Figure 2: Earning levels for different mining actors (Ugx in previous 12 months)



Even where there is significant earning from the artisanal mining operations, findings indicate that this income does not necessarily translate into improved livelihoods. This is particularly so because of the unsustainable consumption life styles of majority of miners particularly men. Most incomes earned are spent on drinking, sexual activity and drug abuse which puts pressure on several social obligations such as school fees, food, medical care and clothing among others and this is more pronounced among the real miners category who form majority of the households and earn the lowest income. Thus, despite considerable earning from the mining operations and the time spent, majority of the respondents reported difficulties in meeting their household economic needs. 80% of the respondents reported difficulties in paying school fees, 95% reported difficulties in accessing and paying for medical care and 70% reported food insecurity in their households. This clearly

indicates that while there is a considerable income earned from the small scale gold mining operations, the income does not necessarily become available to meet social economic needs and there no savings made from income generated which further exacerbates the poverty problem among the mining communities.

This is in agreement with several scholars who assert that the household security of the miners particularly the migrant “rush type” raises concerns for (i) the family they have left behind (Hugues and Furamera, 1999) as well as (ii) the impact this will have on the households of the area where the rush-type mining has developed (Walsh, 2003). Concern has also been raised for the high levels of consumption by miners in rush-type areas, especially on short-term “daring consumption” (Walsh, 2003) leisurely pursuits, such as alcohol, drugs and the provision of sexual services (Drechsler, 2001).

Further, the findings indicate that although women are fully engaged during the mining processes, they are highly marginalized and are given only supportive tasks that do not substantially contribute meaningful economic gains. They play roles such as transporting and processing materials, cooking and supply of food and drinks, moving of tools and equipment, as well as providing sexual services. The males control the incomes generated from the mining but because of their consumption habits such as spending on alcohol, drugs and sexual services, there is often little saving to cater for the household needs which often makes mining business a highly remunerating enterprise but a poor livelihood support enterprise.

Artisanal Gold Mining and other livelihood enterprises

In the mining areas where the entire household had switched to the mining as a sole livelihood enterprise, there are cases of high costs of food supplies as well as food shortages as households have to depend on bought food. 61% of the mining households that gave up farming enterprises reported difficulties in meeting their household needs. This was understood to mean that while small scale mining is a viable livelihood, for as long as the main players (men) continue engaging in unsustainable consumptive behaviours, artisanal mining as sole livelihood option will hardly meet household economic needs.

Mining incomes are also affected by the natural assets such as land. There is a strong linkage between artisanal and small gold mining and natural capital-the land resource. On one side, artisanal mining is seen to supplement and complement agriculture which is a major source of livelihood in most communities surveyed. On the other hand artisanal and small scale mining has been taken up as a coping

mechanism in response to declining agricultural prices, droughts or depletion of natural resource stocks or inadequate land to practice gainful agricultural enterprises. Thus it is prudent to strike a balance in the selection of enterprises needed to meet the household economic needs of miners.

Additionally, the two livelihood activities that is; agriculture and mining compete for the same piece of land resulting into land use changes, conflicts and related ills. 78% of the miners reported to have completely shifted from agricultural activities to mining. It is however, important to note that mining seem to support the wealthier particularly, the land lords and middle men who also have the capital to purchase food and other requirements for their households without necessarily practicing agriculture.

The former agricultural land that was put under mining is now heavily degraded due to poor mining practices (plate 1). Most of this land is part of the fragile wetland ecosystems which provides water sources of domestic and livestock use. As a result, the hydrological, ecological and social economic value of the land has been lost resulting into drying up of animal watering points and springs. Majority of the households that still undertake agricultural activities now have concerns with the source of water for the livestock and other activities and this increases the cost of managing the farming business as well as the cost of water for domestic use. A 20 Litre jerrican of water is sold at 1000Ugx in the mining camp.



Plate 1: Degradation resulting from artisanal gold mining operations

Thus, for mining to improve the livelihoods of miners, adjustments need to be made especially on who controls the income from the mining. Mining should also be supported by other enterprises such as agriculture where the women play a significant role to support household income. This is evidenced by the fact that 94% of the mining respondents that practice diversified livelihoods earned higher incomes and are able to meet their economic needs as well make savings.

Environmental and Occupational Health factors that impede mining incomes

Mubende district one of the study areas has over 10 Gold rush camps attracting populations staying in makeshift tarpaulin Canvas shelters without adequate sanitation and social amenities (plate 2). Most of them don't have access to a latrine (a few available latrine pits ended up becoming gold mining pits.) Actually some clever miners, fearing that their blind myriad of underground tunnels may criss-cross latrine pits, passed word round that the Gold Spirits forbid latrine pits.

Open pit and bush defecation was reported by 60% of the respondents interviewed at Lujinji gold rush areas. As a result, 55% of respondents reported outbreak of Diarrhorea and increased costs on treatment. In addition, there are no health facilities within the camps. Clinics are run by business people who sell expired drugs. There is no safe water, no gravelled road, and neither a good public school at all the Gold rush sites.



Plate 2: Gold Rush site at Lujinji in Kitumbi S/Count_Mubende District

The environmental health issues that characterize gold mining are largely attributed to the informal and often illegal nature of artisanal and small scale gold mining. The economic constraints are therefore as a result of inadequate and rudimental equipments, lack of attention to safety measures, and a frequent lack of expertise and insufficient training as well as high consumption behaviours. In addition to diseases associated with the mining process, there are also health risks associated with chemical use i.e. mercury and cyanide and other occupational hazards such as ground failure, mine collapses (plate 3) and machinery accidents. The above environmental health factors and associated occupational health hazards have economic implications that impede mining incomes.



Plate 3: Mine collapses are common place. Such mining pits have high chances of caving in and killing miners.

Conclusion

While artisanal and small scale gold mining is largely informal and being operated by the local and illiterate community members, the practice benefits more the well to do individuals with connections and purchasing power. In fact the more wealthy members of the community are better leveraged to take advantage of the opportunities offered by Artisanal Small Scale Gold Mining. This is in agreement with studies conducted elsewhere. For example, in Bolivia it was the landed members of the community that benefited from small-scale gold mining rather than the landless ones (Godoy, 2009).

However, there are contradicting findings by other scholars. For example, in Ghana, a detailed poverty and livelihood analysis of three communities that were engaging in artisanal and small scale gold mining found that the local miners were never at the bottom of the community's socio economical hierarchy. Food crop producers, rather than miners, were systematically ranked at the lowest levels (MIME Consult, 2002).

The opportunities for securing significant livelihood security are thus hampered by the many challenges that characterize artisanal and small scale gold mining such as weak or absent government policies, persistent structural barriers like conflict over land-use and access; poor access to financial services; market information and technology; exclusion of certain demographic groups; poor productivity; unsafe working conditions; uncontrolled migration; low entry barriers to illegal activities and adverse environmental impacts, child labour, high transmission of communicable diseases and lack of education.

Further, the full potential of economic benefits is still being hampered by limited choice of the markets for the gold as the miners do not make a choice including lack of capacity for determining the gold prices. This is coupled with lack of proper weighing system as they mainly depend on rudimentary system all of which affect mining incomes.

Thus, strategies that seek to ameliorate these challenges would help to maximize the economic benefits from the mining. The strategies range should from technical, political to social economic interventions what will help to address the current mining discourse and increase mining incomes and the way the mining incomes are put to use.

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