



Comparison between artisanal and small-scale mining in Ghana and South Africa: lessons learnt and ways forward

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Synopsis

Artisanal and small-scale mining (ASM) plays a fundamental role in the national and local economies of resource-rich countries in Africa. As such, more effort must be geared towards fostering this type of economic activity to sustain livelihoods in rural communities. Across Africa, efforts to operationalize ASM based on a sustainable development framework have been quite tedious and often ineffective. This is because most of these frameworks lacked context and an understanding of the continuum from the artisanal through small-scale and up to the junior miner, grouped under the general term 'ASM'. Driven by the need to contextualize some of the definitional issues in this niche sector, and gain a clearer understanding of their peculiar challenges, this paper aims to contribute to the debate on ASM by considering two of Africa's resource-rich countries – Ghana and South Africa. Since South Africa has made greater inroads in protecting the interests of small-scale miners, we thus draw comparisons from both countries' approach to ASM, outline the lessons learnt, and provide recommendations regarding the ways forward.

Keywords

artisanal and small-scale mining, ASM, poverty reduction, legal framework, value addition, support structures.

Introduction

Artisanal and small-scale mining (ASM) is one of the major contributors to national income and is a recognized pillar for poverty reduction in the mineral economies of the developing south (Hentschel *et al.*, 2003; IIED, 2002; ISG, 2011). As an economic activity it has the potential to contribute to sustainable development while successfully aiding the development of rural communities. However, despite this recognized potential, ASM activities remain largely informal, with many attempts at formalization or regulation being sub-optimal (ILO, 2002; AMV, 2009; World Bank, 2013). Furthermore, although the African Mining Vision has acknowledged the importance of ASM, this niche sub-sector of the mining industry continues to face challenges and is still lacking regulation specific to its needs. But, realistically, would regulation of ASM activities mitigate its debilitating effect on the environment?

South Africa, which is a global mining powerhouse and provides the best-case scenario for harnessing mineral rents for growth and development in Africa (Sinkala,

2009), has put in place structures to safeguard the interests of artisanal and small-scale miners under the Mineral and Petroleum Resources Development Act (MPRDA), Act 28 of 2002. However, pertinent issues such as lack of a common definition of ASM; being unable to distinguish and categorize the different types and levels of artisanal and small-scale miners; the high standards or benchmarks for environmental and social regulations; and other geo-political dynamics, also make providing tailored solutions to ASM difficult. That said, South Africa has made greater inroads in addressing some of the challenges of small-scale mining (SSM) at the formal level than most developing countries. Even in this context, a significant proportion of the sub-sector is still not captured or does not operate within the legal framework.

Ghana has been chosen in comparison to South Africa because it is a trailblazer in global mineral production, but lacks context-specific guidelines for ASM. The promulgation of its Minerals and Mining Act (MMA) – Act 703 of 2006, largely incorporated the former mining laws, *i.e.* the Provisional National Defence Council Law (PNDCL) 153 and the small-scale gold mining law (PNDCL 218). This new law, to some extent, also intensified illegal artisanal mining in the country.¹ The reason for this is because in both the MMA and the Environmental Protection Act, there are undefined social and environmental guidelines for regulating ASM concessions. As

¹The local terms for illegal mining are different in Ghana and South Africa. In the Ghanaian parlance, illegal mining is termed 'galamsey', which is translated as 'gather them and sell' or (get them and sell). Zama zama is the local South African term for illegal mining

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a result, unregulated mining activities in communities have been on the rise, despite ASM being instrumental in allaying poverty at the rural level (see arguments in UNECA and AU, 2009 on ASM).

Regionally, the impacts of ASM are mixed due to the overshadowing effect of its negative externalities on land and the environment at large. In Tanzania for example, ASM workers earn ten times more than farmers, and incomes from ASM are invested in shops, taxis, bars, building guesthouses, and farming. In a sense, this sensitive sub-sector presents an opportunity as an alternative source of livelihood for rural dwellers and for local economic development. As such, there are lessons to be learnt from the implications of a highly regulated ASM environment, as is the case of South Africa, and that of the less regulated regime in Ghana, which may help address the critical challenge of mitigating the negative effects of ASM and maximizing its potential benefits.

Undoubtedly, ASM's fundamental role in local economies requires identifying 'ways forward' that can best inform an integrated approach to the drafting of a common international and regional framework for the sub-sector. The objective of this paper, therefore, is to draw parallels from Ghana's and South Africa's approaches to ASM, in terms of the economic, social, environmental, and legal aspects within the broader framework of the African Mining Vision (AMV). This is geared towards specific inputs into the MPRDA and the MMA Act 703 while identifying the 'continuum' challenge between the artisanal and the small-scale miner. We distinguish between artisanal and small-scale mining. 'Artisanal' as used in this paper refers to unorganized mining activity that does not make use of sophisticated machinery, whereas 'small-scale' is used in the context of organized miners that may not necessarily use sophisticated machinery but have a higher revenue turnover.

The regional frameworks: Yaoundé Vision and the MMSD in the AMV

The African regional frameworks on mining (large or small) are hinged on the current African Mining Vision, which aims to transform Africa's mining sector into a knowledge-based economy premised on the 'optimal exploitation of mineral resources to underpin broad-based sustainable growth' for the continent (UNECA and AU, 2009). The AMV is a home-grown vision and structure developed by African governments that incorporates most international and regional calls on sustainable development, particularly the Mining Minerals and Sustainable Development (MMSD) and the Yaoundé Vision on ASM. The Yaoundé Vision, which is specific to ASM, is a declaration document on the importance of the sub-sector, the need to build capacity, and to encourage interlinkages with the broader social economy. This niche sub-sector is the backbone of many rural economies in Africa and provides an alternative source of livelihoods while increasing local purchasing power, but has been quite neglected. The conclusion from the AMV is that the sector has the potential to catalyse small-scale and medium enterprises (SMEs) in rural communities for poverty alleviation. This is, however, often constrained by sustainability issues on the continent, and undefined international and local agenda that are not specific to the needs of SMEs (UNECA and AU, 2009).

Poverty cycles in rural communities are in most cases aggravated by mining regimes and regulations not based on the differing needs of the artisanal, small-scale, and the junior miner. As a result of this constraint, the AMV further contends that artisanal and small-scale miners cannot use their mining rights to access funds, or generate adequate incomes to enter into joint ventures with more capable partners. This is because most mining regimes lump the interests of ASM together, and hence are able to target only those in the small and junior-scale mining categories. Most often, the needs of the artisanal miner is not captured under such formal regimes. Previous interventions recognized the problem not in these terms, but rather in terms of the broader constraints, such as lack of basic mining technologies, top-down approach to dealing with the sub-sector, and a lack of continuity in funding activities for the sub-sector. There has been, on the whole, a poor understanding of the sub-sector and its peculiar needs. This is not just akin to the location and the size of the industry or the geographically-specific economic challenges, but more about the nature and the different needs of the upper and lower bounds within each group of the three categories. Here, we suggest that even within the artisanal group, there are differing needs based on ability to access resources and how the mining regime can capture operators' interests. This also applies to small-scale and junior miners.

On the whole, the AMV identified problems within the wider sub-sector as stemming from:

- Inadequate regulation
- Lack of understanding of the peculiarities of the sub-sector
- Problems with local infrastructure
- Lack of research and developmental support by government to provide a basis for this type of economic activity
- Failure in terms of funding of environmental management education
- Lack of access to orebodies
- A lack of understanding of business management fundamentals and principles (UNECA and AU, 2009).

This analysis feeds into the 'categorization' dimension of viewing the sub-sector, and helps in tailoring solutions specific to each group. In this light, there must be exploration of the broad interlinkages between ASM and other sectors and ways of fostering the growth of the sub-sector. Furthermore, training must be aligned to the different groups within each category, as well as incorporating sound business management principles. In the short term, building capacity of ASM should be aimed at addressing the problems identified in the AMV to help build resilient ASM communities and the transitioning of the Yaoundé Vision. In addition, the AMV's 'Action Plan' seems like a logical framework that recognizes some of the needs of the sub-sector, and provides measures and indices on how to incorporate the sub-sector into policy frameworks. However, without an understanding of the different categories (as well as groups) in each dimension, and their different needs, it would be difficult to enhance the formalization, efficiency, and effectiveness of the sub-sector.

The above discussion leads to three key points of relevance that shape our further reflections of the ASM sub-

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sector in South Africa and Ghana. Firstly, the need for well-targeted interventions, which can only be possible when the definitional issues in both regimes can be tailored for the different groups within each category of artisanal, small-scale, and junior miners. The second intent, which is tied to the first, is orchestrating programmes that can enhance value-addition, especially of metallic and precious minerals, to facilitate a broader linkage to the mineral value chain and the social economies of these two countries. Furthermore, interlinking the institutions that are part of the broader mineral value chain can enhance the quality of the metallic, precious, and industrial mineral products through an ASM beneficiation strategy at an appropriate level of mineral development. This must be aimed at building the capacity of the rural economy, and relieving dependence on the urban economy. These reflections are incorporated into the following discussions by first providing a general overview of both countries' ASM sub-sectors and some of the challenges that may have created dichotomies and intensified informality within the sub-sector.

Case studies: overview of ASM in Ghana and South Africa

Ghana

Ghana is one of the oldest mining countries in Africa, and has extensively rich mineral resources in gold, diamonds, bauxite, and manganese; and unmined but proven deposits of feldspar, limestone, and silica. Small-scale mining in Ghana predates the arrival of the Europeans, and the country has a 2000 year history of gold mining (Hilson, 2001). This type of economic activity has been a source of livelihood to many artisanal miners and others involved directly or indirectly in the sub-sector. ASM has often been overlooked as an effective contributor to gross foreign earnings because production is mostly at the artisanal level (*ibid*). However, the sub-sector has been supportive in alleviating poverty and fostering rural development in many deprived communities. As an important sub-sector, it is highly unregulated, with laxities in the mineral and environmental regimes in protecting the interests and safety of both miners and indigenes alike.

ASM in Ghana involves gold and diamond mining, and to a lesser degree sand and stone quarrying activities. Gavin Hilson's extensive research on small-scale mining concludes that the sub-sector is overly reliant on gold because of its propensity to generate wealth quickly, with the economic importance of the sub-sector often overlooked by national gold mining analyses (Hilson, 2002). ASM activities are found in the Obuasi, Tarkwa, and Wassa areas in the Western, Ashanti, Brong, Ahafo, and northern regions of Ghana, as well as along major water bodies.

Economic contributions

According to Tschakert and Singha (2007), over the past decade ASM production, which is dependent on gold and diamonds, has risen dramatically in Ghana because of rising mineral prices. Economic contributions from the sub-sector accounted for an estimation of US\$461.2 million in 2003, with current contributions to the national economy unknown.

The current labour force participation extends to well over one million miners involved in gold, diamonds, sand winning, and quarrying industries that are predominantly informal or are illegal (Aryee, 2012).

With regards to the formalized sub-sector, only slightly over 300 small-scale miners are registered or are licensed with the Minerals Commission and receive some form of assistance from the government (Mbendi, 2013). However, this form of assistance to aid formalization has been sub-optimal. Hilson (2003) contextualizes this, in his review of ASM under the MMSD that the efforts by government to aid the sub-sector have gradually waned. On the whole, the sub-sector's contribution in terms of production has risen, showing a gradual increase from 1989 until 2003 (per available figures by Tschakert and Singha, 2007). However, the immense number of one million illegal miners compared to just over three hundred licensed or registered small-scale miners should warrant greater justification for effective legalisation of the sub-sector. 'Formalization' as a key policy concern would increase the potential for curbing illegal smuggling channels, and subsequently increase local mineral output. This should be a major government priority, because essentially the sub-sector contributes not only to the national coffers, but also to alleviating poverty. Most illegal Ghanaian miners also use the incomes they receive as start-up capital for business ventures such as shops, pubs, etc. An International Labour Organisation (ILO) report in 2003 confirmed that the majority of the 13 million people worldwide directly dependent on ASM had two or more dependents to support.

The path of formalizing the ASM sub-sector started 1989 when the government of Ghana embarked on a structural adjustment of the economy with technical support from international financial institutions. Mining was identified as a core area to be restructured. Thus, the government of Ghana also recognized the need to progress with formalization of the illegal small-scale gold sub-sector due to the leakage of revenue. In that effort, the Precious Mineral's Marketing Corporation (PMMC) Law (PNDCL 219) was enacted, establishing a government corporation that was solely responsible for the buying of all precious minerals and stones from artisanal and small-scale miners. PMMC, currently a quasi-governmental company instead of a 'corporation', operates through licensed agents that buy gold, silver, and diamonds from legal miners. Thus by law, gold and other minerals produced on a small-scale level cannot be sold or exported without having gone through the PMMC. Only large-scale mining companies export refined gold and or polished precious minerals.

Environmental and social Impacts

According to Ghana's Minerals Commission, gold is found along a series of tectonic boundaries that were active some 2 billion years ago. This caused gold belts to be formed containing Proterozoic greenstone-type gold lode deposits in Birimian rocks. This mineralization extends into Senegal and Mauritania, and northwards into Burkina Faso (Hilson, 2002). The Tarkwaian gold-bearing deposits constitute a second gold belt formed under different conditions, and consist of auriferous quartz-pebble conglomerate deposits.

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As a result of the nature of this type of formation (*i.e.* placer or alluvial gold) and the geography of its location, it presents no physical entry barriers to any person that wants to engage in the sub-sector. Similarly, in most parts of the world where 'placer gold' exists, it is relatively easy for ASM to be centred around this type of mining, because very low capital investment is required, and the use of simple but destructive techniques requires a low level of technical specialization. These factors result in disastrous effects on the environment, due to the rudimentary practices applied, such as sluice boxes, hammers, buckets, shovels, and pans for prospecting, and removal of vegetative cover on mineral-rich soils.

There has been a lack of adherence to safety and health standards, as well as structural deficiency such as support for excavations. Furthermore, there has been degradation of landscapes, and destruction of water bodies through the use of mercury in the amalgamation process. This threatens human health, pollutes water bodies, and causes other ecological impacts. According to the Wasswa Association of Communities Affected by Mining, over 200 water bodies have been polluted due to incorrect mercury usage, resulting in serious health hazards such as damage to the central nervous systems of humans and animals, and increased risk of skin cancer in areas where ASM is prevalent (Ghana Business News, 2011). NSR (1994) research on ASM miners found, from urine, hair and blood samples taken from the miners, that they have been increasingly exposed to large quantities of mercury. Substantially, the careless use of mercury and land degradation from ASM are the greatest threats to the environment in Ghana. As a result, the biggest barrier to an effective and formalized ASM sub-sector has been the environmental and mineral regimes. These have been sub-optimal in addressing the differential needs of the different categories of ASM, the methods used, and the consequences of these methods.

Tschakert and Singha, (2007) have argued that although ASM activities predominate because of poverty, the Ghanaian populace see the sub-sector as a nuisance to the environment. However, ASM is a direct consequence of the history and intensity of poverty in rural communities. Hence, the mineral and environmental regime may need to revise the older approach of viewing the consequence of ASM activities as a nuisance, to one that must facilitate coherence with the legislature. That can be made possible only when tailored solutions to environmental problems take into account the peculiar and differentiated needs of the different categories within ASM, as well as the different types and groups.

Organization of ASM and challenges within the legal framework (MMA, Act, 703)

As per the current law (Mineral and Mining Act – MMA, Act 703), a small-scale mining licence is granted when an interested party first obtains a customary and legal right to use the land from the Chief of the area (Appiah, 1998). Observing all customary procedures, a person applies to the Minister for a mining license, which is distinct from a mineral right, through the Minerals Commission. The Minerals Commission assesses the credibility of the applicant and forwards the prospective miner's application to the Environmental Protection Agency to assess the environ-

mental impacts. This Agency is the environmental regulatory body responsible for environmental protection. It then makes its decision on whether the Minister should grant the applicant the mining license. Besides this bureaucratic procedure, Tschakert and Singha (2007) contend that the District Assemblies, which are municipal bodies, require an upfront (lump sum) payment, and thereafter a yearly payment to mitigate the environmental impacts of mining activities. On reflection, this serves as a disincentive to Ghanaian individuals (largely those within the category of 'artisanal') wanting to formally register their operations with the Commission. Most would therefore prefer to operate outside of the legal regime to avoid paying the lump sum and annual contributions for environmental remediation.

With regard to the Mining Law (MMA), the interests of ASM are captured under articles 81 to 99 of the Act. In the Act, small-scale mining is clearly recognized as a prudent economic activity reserved for citizens of Ghana. However, the different types of ASM activities are not differentiated in the Act. The law applies across the board and lumps the interests of all small-scale mining operatives together. The flaw in this, the authors believe, stems from the fact that the older and more specific law (PNDL 218 in 1989), which was the first legal framework to legalize the activities of small-scale gold mining, was specific to that industry. Hence the incorporation of its abridged version into the current legal framework should have been sensitive to the different types of mining activity. Furthermore, it should have considered the nature of the socio-economic status of individuals involved in mining at the artisanal and small-scale levels as a criterion for providing for their varied needs.

This is key to any regime that wants to provide a rural development and poverty alleviation system, especially where the communities are artisanal and small-scale miners and rural. This is because the impact of this sub-sector at the artisanal level on mitigating poverty and transforming rural economies is greater than that of many large-scale mining operations. In this regard, Hilson (2002) notes that the pivotal role of ASM in poverty alleviation justifies an increase in community capital and government help to diversify such local economies.

Even though the AMV has recognized the importance of building capacity, Ghana has yet to specifically translate some of the outcomes in Cluster Goal 4 of the AMV's Action Plan into a proper ASM policy framework in this light. Thus for Ghana's MMA, Act 703, the challenges hinge on:

- 1 Incorporation of best practices of international and regional frameworks
- 2 Identifying the varied interests and definition of the various categories under ASM
- 3 The inability to contextualize and quantify the impacts on the environment based on a set of established guidelines.

Finally, and pertinent to the challenges discussed, it is essential to understand that there is a continuum from the artisanal to the small-scale and then to the junior miner. Therefore, the provision of support services, environmental guidelines, and benchmarks may have to consider the varied dimensions of the ASM sector for better quantification and formalization.

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South Africa's ASM sub-sector

The South African minerals sector is one of the most diverse in the world. South Africa is home to the largest deposits of chrome, manganese, platinum group metals, vanadium, and vermiculite. South Africa was formerly the leading producer of gold and diamonds (USGS, 2012). Unlike Ghana, the country has been able to harness its mineral resources for tangible growth and development, and is currently the most developed country on the African continent. Traditionally, both large- and small-scale mining have been the building blocks of the economy, with large-scale mining having had a positive impact GDP and development.

The small-scale mining (SSM) sub-sector in South Africa, like elsewhere, is very difficult to classify and categorise (Mutemeri *et al.*, 2010). It is also significantly smaller than the Ghanaian sub-sector. Firstly, there is no clear and encompassing definition of SSM, and related to this, a general lack of data on the size, activities, and geographical distribution of the sub-sector. The Mineral and Petroleum Resources Development Act (MPRDA), which regulates mining activities in South Africa, does not define SSM but makes provision for a Mining Permit which includes those activities that would generally be accepted as SSM, based on the physical size of an operation (limiting it to 1.5 ha) and the duration of the mining activity (3 years).

A broader definition of ASM, however, includes mining operations with no or low levels of mechanization, undertaken by individuals, families, or groups. The activities are possibly on a subsistence level, and are often seasonal or supplementary to other economic activities, and in many cases are informal (outside of the legal system) (DME, 2007). Within the South African sector, mining activities range from artisanal mining to small-scale and junior mining and to very large, industrial-scale mining. It is argued here that the MPRDA does not address this full range of activities, with the focus on the SSM being on the small, rather than artisanal, miners. It is understood that the size of the SSM sub-sector has increased since the transition to democracy, with the sub-sector opening up to more people. There is, however, a significant lack of reliable data (Mutemeri *et al.*, 2010). Mutemeri and Petersen (2002) estimated that there were around 20 000 miners active in the sub-sector, although a more recent report estimates the number to be 10 000 (Buxton, 2013), with many of them women. Of these, only an estimated 6000 were operating within the legal framework and mostly on the small-scale mining end of the spectrum (DME, 2007) (note that these figures are from a 2001 report and hence refer to the previous legal framework).

Artisanal and small-scale miners are active in a range of commodities, depending largely on the availability of deposits, ease of mining, processing, and extraction, and access to markets (Mutemeri and Petersen, 2002). Gold, diamonds, coal, and construction materials (*e.g.* sand, clay, sandstone, slate, granite) are more commonly mined, with construction materials predominating (Mutemeri *et al.*, 2010). Due to the nature of ASM, the methods are limited to open pit and primitive underground excavations. The level of beneficiation depends on the commodity, and with the exception of construction material, is limited. In the case of construction materials, finished products (*e.g.* bricks) are often produced by ASM operatives (Mutemeri *et al.*, 2010).

The re-opening of old mine workings is not uncommon in ASM and is presenting a significant environmental, safety, and security challenge to the large mining companies that are either still operating or are responsible for these mines. In this case there is a blurred line between informal ASM and illegal mining. Illegal mining in South Africa is a criminal industry involving national and international syndicates and valued at around R5.6 billion (address by the Minister of Mineral Resources to the National Council of Provinces in the debate on illegal mining, 16 September 2009), and has been increasing since the early 1990s, largely due to downscaling in the large-scale mining sector. Illegal miners (*zama-zamas*) access disused mines, largely gold mines, to extract the small quantities of remaining ore. The areas around Barberton, Westonia, and the Free State gold fields have been hardest hit by their activities (SA Government News Agency, 19 July 2012).

Legal framework and support structures

As already noted, the MPRDA makes provision for a mining permit to accommodate small-scale miners. The maximum size (limited to 1.5 ha) and the duration of the permit (3 years) are both small in comparison to the mining rights granted to large operators for a period of 30 years, where the size is not limited. Prior to the MPRDA the majority of South Africans did not have access to mineral rights and this was seen as a major block to the development of SSM, which was identified as 'a vehicle for the creation of jobs', a 'channel for increased access to the mining industry', and an opportunity to optimally exploit resources that large-scale miners are unable to operate profitably (DME, 1998). The 1998 White Paper, *A Minerals and Mining Policy for South Africa*, further stressed that all forms of mining should be subject to the same requirements in respect of licensing, safety, health, and the environment and hence the requirements of the MPRDA, which from the perspective of ASM are onerous.

The application for a mining permit requires the submission of an Environmental Management Plan (an abbreviated version of the Environmental Management Programme required for a mining right) notification and consultation with the landowner, occupier, and other affected parties. With the exception of the less arduous environmental requirements and the social and labour plan, which is required only for a mining right, mining permit holders have to meet the same requirements as those for large-scale mining, namely reporting, monitoring, and performance assessment requirements, the requirement to make financial provision for environmental remediation, and the need to plan for and obtain closure. In addition to the MPRDA, artisanal and small-scale miners may also need to comply with the requirements of the National Environmental Management Act (NEMA) should any of their associated activities (*e.g.* roads, pipelines) trigger a Basic Assessment or Scoping and full Environmental Impact Assessment; the National Water Act for any water uses; and a range of other environmental, labour, health and safety, and business requirements. The financial resources, skills, and capacity required to meet this range of legal requirements are high, acting as a barrier to artisanal and small-scale miners who wish to enter the sub-sector legally and a severe constraint on the ability of the sub-sector to contribute to poverty

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alleviation (Hoadley and Limpitlaw, 2004). This is especially true of those closer to the artisanal end of the spectrum. The question is thus – how can artisanal and small-scale miners be accommodated in the formal system, recognizing the need to maintain environmental, social, and labour standards?

A partial answer to this question is – with support. The Department of Mineral Resources (DMR) through their Directorate for Small-Scale Mining, along with other institutions such as Mintek, the Council for Geoscience, and the Mining Qualifications Authority (MQA) offer support specifically to the SSM sub-sector so as to enable greater participation. The DMR's major focus is on assisting small-scale miners to meet the legal requirements, with the Small Scale Mining Board providing capacity and experience in planning and developing viable mining projects through their pre-feasibility stages (DMR, 2013). Furthermore, Mintek's Small-Scale Mining and Beneficiation Division supports the sub-sector through research and development of appropriate technologies and by providing training and business development skills on the manufacturing and marketing of products from clay, sand, gold, and granite (Mintek, 2013). The MQA has also set aside funds for the provision of technical training in minerals extraction, geological aspects, health and safety, environmental management, and mining legislation (MQA, 2013).

Parallels between South Africa's regime and Ghana's

The overview of the case studies shows how neither the MPRDA or MMA are able to identify the varied interests of the artisanal, and sometimes the small-scale, miner. As illustrated in Figure 1, the mining legislation in Ghana and South Africa addresses only a portion of the current activities in the SSM sub-sector, with those at the lower end of the spectrum, the artisanal miners, functioning outside the legal framework. The arduous nature of the different legislations acts as a barrier to entry in both cases, with the impacts of the mining laws not being felt at the lower end of the continuum. With resources and technical and financial support, the range of artisanal miners being included in the formal sub-sector can increase, albeit to a limited degree. These are increasingly available to those at the top end of the ASM continuum.

South Africa's MPRDA is stringent on environmental protection, as is shown in Table I. Thus, it is easier under both the MPRDA and the MMA for the upper bound, from

small-scale to junior miner, to be captured, regulated, and furthermore to obtain a mining license or permit than for those in the bracket of the lower bound of the artisanal. Ghana's somewhat relaxed regime also makes no mention of artisanal mining, nor does it attempt to categorize the different types of SSM and their peculiarities in the MMA. The MMA regime therefore makes it very easy for miners to operate informally, with no mining license/ permit.

Hence, on the whole, the impact of both regimes regarding support services and resources is felt only within the identified niche (somewhere between the ranges of 2 to 3 in Figure 1). In South Africa's context, the MPRDA is also not able to differentiate between artisanal and small-scale mining, with no reference to or definition of what artisanal means in the Act. As a result, the impact of both regimes has been questionable as regards mitigating the needs of the mining rural poor, who are in most cases heavily dependent on the artisanal form of mining for direct or indirect livelihoods. Understanding these contexts (in Figure 1) leads to the similarities and parallels that can be drawn from both case studies. Table I lists some of the core issues that have been identified by the AMV as pertinent to addressing some of the challenges of the ASM sub-sector in Africa and the need for a drive towards a sustainable rural socio-economic development.

Contextualizing the issues of ASM (what have been the lessons?)

From both the Ghanaian and South African contexts, it is evident that the lack of a definition and, specifically in the South African case, the shortage of reliable data, is a hindrance to the development of the ASM sub-sector. The broad range of activities that are grouped under the general title of 'artisanal and small-scale mining' needs further and finer classification in order to understand and provide for the specific requirements of the different sub-groups. Collecting data that illustrates this diversity within the sub-sector, the scale and distribution of ASM, and its contribution to the economy would allow for more informed and hopefully better decision-making by the authorities and development agencies. The 'size limit' of the South African Mining Permit is an example where a 'one-size-fits-all' approach has been taken without considering the continuum of participants active in the sub-sector and the differences between the various orebodies. The size of the permit or licence granted

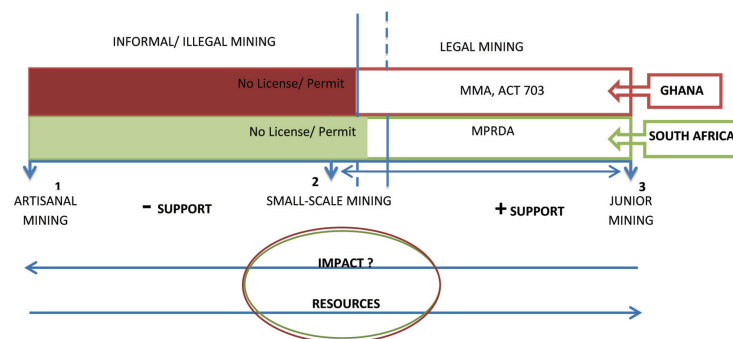


Figure 1—Authors' interpretation of the impact of South Africa's and Ghana's mineral regimes on informality

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Table 1
Parallels and similarities between South Africa and Ghana's ASM regimes

	South Africa's MPRDA	Ghana's MMA, Act 703
Definitional issues	a) The law does not define small-scale mining but makes provision for a mining permit, for small-scale operations. b) No provision is made for artisanal mining in the Act. c) Regulation covers all minerals, whether occurring naturally or in residue deposits or residue stockpiles. d) Guidelines to assist small-scale miners have been developed within various government departments, including Mineral Resources and Water Affairs.	a) The law is applicable to only small-scale mining with no reference to the different categories of small-scale miners b) No provision is made for artisanal mining in the Act or attempt to define them c) Regulation is tailored to mining only gold, diamonds, and some forms of industrial minerals and winning and quarrying, but even at the artisanal level there is no clarity or distinction d) No environmental limits and guidelines specific to the varied artisanal and small-scale miner needs are provided.
Rights	Mining Permit	Mining License
Size and duration	1.5 ha for 2 years, renewable for a further 3 periods each not exceeding 1 year.	21 ha for 5 years, renewable subject to the Minister's discretion.
Environmental requirements	An Environmental Management Plan is required prior to granting the Mining Permit (vs. Environmental Management Programme required for Mining Rights for large-scale mining). Additional requirements in other pieces of legislation.	Government body (Environmental Protection Agency does the assessment). No EMP is required of the miner applicant at the small-scale level.
Fund for rehabilitation	Requirement to make financial provision for rehabilitation and management of negative environmental impacts. This should be reassessed annually.	Payment of lump sum to the District Office (Environment) and a subsequent annual payment. No production and financial reporting as a pre-requisite for the payment of lump sum when project is exhausted.
Social and Labour Plans (SLP)	No Social and Labour Plan requirements for Mining Permit.	No Social and Labour Plan requirements for Mining License.
Royalties	The legislation requires holders of a Mining Permit to pay the state royalties. However, below a certain threshold level (R100 000) this is waived (as per Mineral and Petroleum Resources Royalty Act 28 of 2008).	Payment of between 3% to 6% required of small-scale miners as royalty.
Market access	No specific provisions around marketing.	Subsidized below market price and saleable only to the requisite government body – in this case the Precious Mineral and Marketing Company (PMMC).
Level of reach of regulatory body.	Mineral resources are a national competency with regional offices based in each of the nine regions (provinces).	District Offices of the Minerals Commission are located in all areas where small-scale mining activity is present.
Support structures	Various agencies providing services, including the Department of Mineral Resources: Small-Scale Mining Directorate, Mintek, Mining Qualifications Authority, Council for Geoscience, Small Enterprise Finance Agency (previously Khula).	Minerals Commission, Ministry of Lands and Natural Resources, Geological and Survey Department.
Cohesion between LSM and ASM	The relationship between ASM and large-scale mining ranges from support and assistance, cooperation to conflict.	There is non-cohesion between LSM and ASM, although some LSM companies have implemented programmes to facilitate cohesion.
Other legal frameworks	Environmental requirements under the National Environmental Management Act, water use and licensing requirements in terms of the National Water Act, Mine Health and Safety Act; and a range of other pieces of legislation related to labour and skills and business operation.	Environmental Protection Act, 490; New instruments to aid in the MMA- mine support services, compensation and re-settlement, licensing, explosives and health and safety regulations have been recently passed in 2011. However, as to their application to the sub-sector, this is not very clear.

for ASM is a factor since the orebody formation can extend beyond the licence or permit boundaries. There is thus a need for legal regimes to consider the type of mineral deposit and the geological formation, and define a prerequisite size for the different groups within the categories of artisanal and small-scale miners. This would aid in improving the regulation and management of the different variants in ASM. For instance, although this distinction is also not made clear in the Ghanaian situation, the number of years for which a mining licence/permit is granted, and the larger size, give the small-scale miner an added advantage in recouping profit compared to the South African case.

Another pertinent issue is that of environmental protection. The laxity in Ghana's framework and a lack of proper guidelines and practice makes it very easy for even

registered small-scale miners to abscond with profits without due diligence on the environment (notably mine plan and closure). As a result, the EMP in South Africa's case, which is sometimes a stumbling block as noted above, may be a key solution that can be tailored to fit the Ghanaian context. This would enable the country to curb the land degradation and pollution that currently prevail in areas of ASM activity. However, only when government is able to systemically identify and categorize the different types of ASM on the continuum scale (Figure 1) will the 'EMP solution' work in the instance of Ghana. Even in the case of South Africa, where support structures have been provided for anyone requiring help with an EMP, the hurdle is quite high for an uneducated artisanal miner who may be at the bottom of the tier (Figure 1). As such, consideration must be given to

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firstly defining the interests of all the groups on the continuum scale, and their varied needs, before such regulations and guidelines are determined.

Furthermore, in both Ghana and South Africa, value addition is limited, yet this is an important opportunity for increasing the revenue generated from ASM. This was suggested in the AMV review section as a key import to dealing with the sub-sector. Critical to this is skills development, access to appropriate technology, and reliable and fair markets, as was recognized in the AMV. In this regard, sustainability certification is also a recent opportunity leveraging market demand for sustainability to improve social and environmental conditions and outcomes. Additional benefits include access to better markets, greater returns, and an opportunity for learning by artisanal and small-scale miners (Blackmore *et al.*, 2013). The 'Fairtrade' and 'Fairmined' Gold and 'Associated Precious Metals' Initiative is one such scheme focusing on ASM in Latin America. Such sustainability certification comes with a range of requirements but with operation within the legal system not being varied or categorized. Thus, in addition, it could become onerous for artisanal miners not captured in the formal regime to comply with the assessment standards for certification. However, creating a local beneficiation strategy such as that currently being implemented by Mintek (although limited to small-scale miners) and lowering the bar for 'fairtrade' and 'fairmined' sustainability certification can be an opportunity for value creation and linking with the broader social economy.

As was discussed earlier, there are a number of institutions in South Africa that aid SSM, although the capacity and resources may not be matched to the size of the sub-sector. This support is limited in the Ghanaian context. However, Ghana's district offices of the Minerals Commission, which are located in all areas where small-scale mining activities are present, is one that South Africa could consider. Having officials located in the major small-scale mining areas will not only assist with data collection and monitoring, but also facilitate compliance by the miners. Although this institutional support structure is available in Ghana, support services for value-addition as well catering to the needs of ASM are lacking because of funding issues (Hilson, 2001). Therefore, providing a 'one-stop-shop' at the district level where information on the legal requirements and financial support is freely available will be helpful in redressing these lessons learnt in the Ghanaian case.

Conclusions and ways forward

Some have argued that the environmental and social costs of artisanal mining outweigh the benefits, and so these activities should not be encouraged. However, the immense contribution of artisanal mining to poverty eradication at the community level cannot be ignored; and hence every attempt must be made to address the negative aspects and optimize the benefits in order to find a better balance between the two. Nevertheless, the question would always remain whether this form of mining should be encouraged (see Scott, 1998 in Mutemeri and Petersen, 2002). The answer the authors purport is that simplistically, the major aim of ASM is poverty alleviation, hence it must be encouraged, although not at the

expense of the environment. Stringent and cautious efforts must be made by the governments of both Ghana and South Africa to address some of the peculiar challenges that the ASM sub-sector is fraught with, in order to promote the interests of the artisanal, small-scale and junior miner as well as regulate their activities to aid in the protection of the environment.

From the lessons learnt and the schematic 'Action Plan' by the African Mining Vision, it is expedient that the first point of call in terms of policy objective would be tailoring a solution that recognizes the different types of ASM along the continuum scale of the three types of miners, as indicated in Figure 1. As indicated by both case studies, the MPRDA and the MMA must aim to define artisanal mining, and refine their definition of small-scale mining, to incorporate the needs of all along the continuum. This would further mean a systematic analysis based on the socio-economic status of the miners, the type of minerals exploited, the number of miners to be defined as artisanal, small-scale, or junior, their production values, and strategies to foster effective mineral beneficiation. At face value, the EMP presents the ultimate way forward in dealing with environmental protection, but it seemingly creates a barrier for the artisanal miner who cannot afford to meet the benchmarks. As such, there is need for a simplified EMP supported by institutional structures that can reach those already involved in illegal artisanal mining and to protect their interests as well as the environment.

In the instance of Ghana, the following are recommended to improve the MMA, Act 703 and facilitate clarity on the issue of ASM:

- Operationalize the AMV's 'action plan' into a one-stop-shop at the Mineral Commission's district offices
- Identify some of the best practices through a simplified environmental management code of practice on land degradation and reclamation, water and air quality, and mine closure that are specific to the different dimension within the ASM sub-sector
- Set health and safety standards and promote awareness
- Regularize the informal sub-sector through approaches that recognize the varied interests of all artisanal and small-scale miners
- Provide the institutional support structures that aim to give backing in terms of mineral value-addition, and to link it with the broader socio-economic framework in rural communities.

Impliedly, the justification is for a holistic and multi-pronged approach at the international level that would feed into a regional and local policy framework. However, this can be effected only if international integrated benchmarks and guidelines are developed to grow the ASM sub-sector as a burgeoning 'economic activity'. This would be in order to address the core need of poverty alleviation at the national level, as well as build alternative and sustainable livelihoods and economic infrastructure for rural dwellers.

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