



Preliminary study on artisanal and small-scale mining in South Africa



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Cover photo: A woman 'dressing' stone at a tiger's eye mining site, in Prieska

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Acronyms and abbreviations

AM	artisanal mining	SAMRAD	South African Mineral Resource Administration System
AMDC	African Minerals Development Centre	SEDA	Small Enterprise Development Agency
AMV	Africa Mining Vision	SEFA	Small Enterprise Finance Agency
ASM	artisanal and small-scale mining	SSM	small-scale mining
BAR	basic assessment report	SSMB	Small-Scale Mining Board
CGS	Council for Geoscience	MHSA	Mine Health and Safety Act
CMV	Country Mining Vision	NWA	National Water Act
CSIR	Council for Scientific and Industrial Research		
CSMI	Centre for Sustainability in Mining and Industry		
DME	Department of Minerals and Energy		
DMR	Department of Mineral Resources (previously DME)		
ECDC	Eastern Cape Development Corporation		
EIA	environmental impact assessment		
IDC	Industrial Development Corporation		
IDP	integrated development plan		
LED	local economic development		
LSM	large-scale mining		
MEPC	Minerals and Energy Policy Centre		
MPRDA	Minerals and Petroleum Resource Development Act		
MQA	Mining Qualification Authority		
NEMA	National Environmental Management Act		
NSC	National Steering Committee		
SADC	Southern African Development Community		
SAHRC	South African Human Rights Commission		

Provinces

EC	Eastern Cape
FS	Free State
GP	Gauteng
KZN	KwaZulu-Natal
LP	Limpopo
MP	Mpumalanga
NC	Northern Cape
NW	North West
WC	Western Cape

Executive summary

Introduction

This research study provides a first look at the landscape of the artisanal and small-scale mining sector in South Africa, its challenges and opportunities to contribute to socio-economic development. The study was commissioned by Open Society Foundation (OSF) for South Africa.

Objectives

The objectives of the study were to: (1) review and redefine a framework to categorise ASM activities in South Africa, (2) provide the status of legal and illegal ASM operations in South Africa, (3) determine the economic potential of the ASM operations, (4) provide insights into the major challenges and successes faced by ASM operations, and (5) review the regulatory framework and related interventions and their impact on the development of the ASM sector.

Approach to study

The study was conducted through literature reviews and key informant interviews with various stakeholders working in the sector.

The importance of the study

The importance of ASM for socio-economic development in South Africa is elaborated in the White Paper on Minerals and Mining Policy of 1998, which led to the legal provisions found in the Minerals and Petroleum Resource Development Act (MPRDA). Its importance is further echoed at a regional level in the SADC Protocol on Mining as well as at a continental level in the Africa Mining Vision (AMV).

Main findings of the research

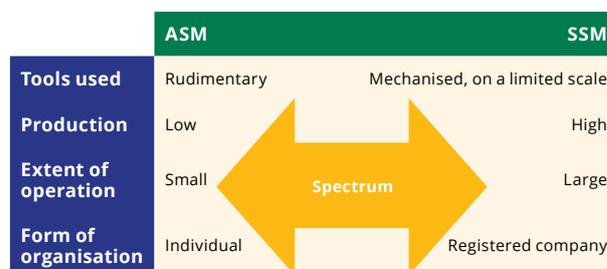
The following are the main findings from the research:

1. Definition and categorisation of ASM

There is no globally accepted definition of ASM. ASM means different things to different role-players and stakeholders, and hence each country has their own definition. In the case of South Africa, ASM is defined using the National Small Business Amendment Act which uses the number of people employed and capital investment to differentiate between the categories of ASM. While this is regarded as the 'official' definition, it is acknowledged that it does not capture the nuances and complexities of the ASM sector in South Africa.

Within this context, CSMI proposes a definition that recognises ASM as a level of mining along a spectrum when compared to large-scale mining (LSM). As a level of mining, ASM can be described according to the following parameters, **but not limited to**: tools used, production output, size of operation and level of organisation. The framework from ASM to small-scale mining (SSM) is illustrated below.

ASM framework and legality

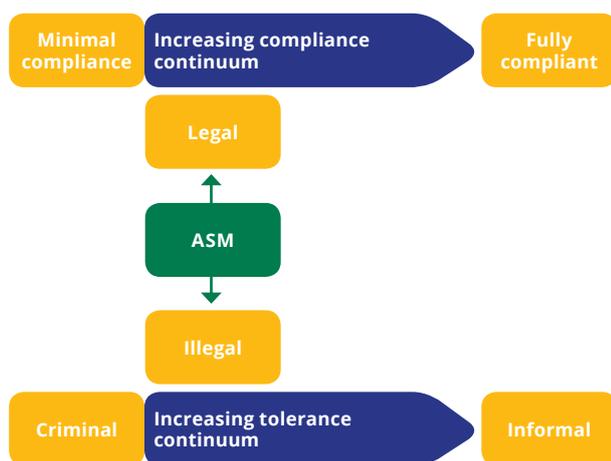


It is important to note that this framework takes no position on legality or illegality, which is determined from the way ASM is practised in relation to the laws and

norms of the particular jurisdiction. Two categories of ASM emerge through the legal lens – legal ASM and illegal ASM. Legal ASM conducts operations within the documented law (e.g. in possession of a mining licence) and illegal ASM practices outside the law.

Taking into account the realities on the ground, there appears to be a continuum in both the legal ASM and illegal ASM. The figure below illustrates the relationship between different types of ASM found in South Africa when distinguished on a legal basis. For instance, within the legal domain, one could distinguish between those that are fully compliant with all the legal requirements and those that are not fully compliant. Also within the illegal domain, the continuum range could be described as ‘criminal’ to ‘informal’, as shown in the figure.

ASM framework and Zama-Zama mining



Due to the prevalence of Zama-Zama (‘we are trying’) mining in South Africa it is important to understand how it fits into the ASM categorisation framework. Its association with rudimentary tools makes it a type of ASM. In terms of the continuum as described above, it appears that the application of the term includes both ‘criminal’ as well ‘informal’ mining. Where Zama-Zama mining is not directly linked to criminal gangs it is accorded the status of ‘informal’ ASM and where there is involvement of crime syndicates then it is ‘criminal’ mining.

The level of legitimisation which results in the degree of tolerance is situation specific. Each situation must be assessed on its own merits. It is therefore important to start understanding the different Zama-Zama mining activities with the ultimate objective of defining a criteria for tolerance which could be supported by the different

stakeholders as we move towards the transformation of the ASM sector in South Africa.

2. The current status of the ASM sector

Size, distribution and location

While the number of people working in the ASM sector is unknown, it is estimated that it ranges between 10 000 and 30 000. Practitioners working in the sector have reported that while they do not have information in terms of the size of the sector, those that practise outside the legal framework far exceed those with appropriate mining licences. The provinces with the highest number of ASM activities include the Northern Cape, North West, Mpumalanga and KwaZulu-Natal.

ASM and mineral potential

ASM operations in South Africa are not restricted to specific mineral commodities. They are allowed to exploit any type of mineral as long as it is within the required provisions of the mining licence. Minerals exploited by ASM range from precious minerals and metals to industrial minerals and construction materials. There is a tendency to associate ASM with high-value minerals such as gold, diamonds and gemstones. While the majority of ASM exploit high-value minerals on the continent, this is not the case in all African countries with ASM activities. The bulk of ASM activities in South Africa are linked to local livelihood such as traditional clay crafts, brick making and stone aggregate.

While the norm has been to focus on high-value minerals, there is an increasing recognition that industrial minerals and construction materials are important to the development of the ASM sector particularly in rural areas. These minerals present opportunities for livelihood, particularly for women. It is our view that this is a ‘low hanging fruit’ in terms of the development and the transformation of the ASM sector in South Africa.

ASM and socio-economic development

There is currently no research that provides a picture of the contribution of the ASM sector to the economy both at macro and micro-levels. There are a few anecdotal studies with some evidence suggesting that ASM activities are important sources of livelihood for communities. These studies have also revealed that there is a considerable number of women that depend on ASM for their livelihood.

Challenges facing the sector

The ASM sector in South Africa is considered complex owing to a myriad of challenges which range from social, environmental and economic. Some of these challenges have to some extent contributed indirectly to the precarious conditions in which miners find themselves and these include, inter alia: an inadequate policy and legislative framework; costs associated with the regulatory and administrative obligations; lack of financial resources and limited market opportunities; limited technical capacity and access to appropriate technology; lack of institutional support; insufficient training opportunities; lack of information; and insufficient government capacity.

3. Legislative framework governing ASM

The provisions for ASM in South Africa are comparable to those in other African countries, with some pertinent differences. Some of the provisions present challenges and barriers with respect to administration, regulation and compliance, and prove to be counterproductive to the development of the sector. Some of the key considerations for possible optimisation of the legislation are summarised below.

Provision	Description
Definition	Recognising that there is a spectrum of ASM as a level of mining and this continuum should be reflected and supported by legislation.
Categorisation of ASM activities	Considering separating artisanal-level operation from small-scale operation with options for upscaling to the next level Be explicit about the provisions for artisanal mining and small-scale mining in the legislation
Local participation	Creating designated zones for ASM operations. These could be guided by the level of ASM activities in the different provinces, and the concentration of specific mineral commodities in particular provinces (e.g. sandstone in QwaQwa, Free State; tiger's eye in Prieska, Northern Cape)
Duration of validity	Increasing the duration of the mining permits in line with the requirements of financial institutions and also taking into account the life cycle of mining operations.

4. ASM supporting interventions

While there have been several initiatives established to support the sector, there is limited information on the

impact of these initiatives on the ASM sector. There have been very few assessments or analyses of supporting programmes by either government or supporting institutions. The dearth of research on these interventions warrants a research study which would assess the impact of these programmes on the sector, to draw lessons and suggest recommendations for future ASM programmes.

5. Recommendations towards the transformation of the ASM sector

As a signatory to the AMV, South Africa should be guided by the key tenets of the vision in transforming its ASM sector. This is about transforming the ASM sector through holistic and integrated formalisation programmes that acknowledge that minerals are a finite resource and therefore need to be transformed into more sustainable forms of capital for alternative sustainable livelihoods. South Africa should consider a targeted domestication of the AMV focusing on the ASM sector. This process requires there to be baseline data of the sector, a consultative process during the policy and legislative framework development as well as monitoring and evaluation of the implementation.

An important part of the transformation framework is also the golden triangle for supporting ASM development, which includes access to finance and markets and extension services, for improved performance of ASM operations.

6. Research gaps and framework for further research

It is clear from the findings of the report that there is a need for a baseline study to collect ground-level data on ASM activities. Broadly, the baseline study should seek to answer the following questions:

- What is the nature of ASM in South Africa with respect to the type of commodities exploited, the types of activities across the mining value chain, considering both legal and illegal (e.g. including Zama-Zama mining)?
- How big is the sector and what are the distribution trends with respect to geographical spread and commodities?
- What is the current and potential contribution of ASM to local livelihoods and economic development in South Africa?

- What is the impact of ASM on the environment, society and economy, considering both the negative and positive impacts?
- Who are the key stakeholders, how do they currently shape the sector and what role can they play in its future development?
- What has been the impact of and lessons learnt from past and existing initiatives established to support the development of the sector?
- What is the best ASM categorisation framework for South Africa and how does that translate into a legislative and institutional framework that will bring about optimal developmental outcomes?

7. Future research

Looking ahead, more work is still needed on the following:

- **Research project** – Investigating the idea of regulating spaces rather than individuals, for

example designated zones for ASM development in South Africa as an alternative policy response. This research would involve identifying an area or region with high levels of ASM activity; collecting baseline data in that particular area in terms of the size and nature of operations, demographic profiles, understanding challenges and opportunities. Included in the study would be: mining value-chain analysis, stakeholder analysis, the role of different stakeholders including LSM; identifying synergies and potential partnerships.

- **Advocacy project** – Disseminating the findings of this report. This could be done through a targeted workshop to discuss the findings and recommendations for the transformation of the ASM sector in South Africa and through advocacy related to supporting the AMV by raising awareness and educating the different stakeholders about the AMV as we move towards a shared vision for ASM in South Africa

1. Introduction and objectives

The Centre for Sustainability in Mining and Industry (CSMI) was commissioned by Open Society Foundation for South Africa (OSF-SA) to conduct a preliminary study on artisanal and small-scale mining (ASM) in South Africa. The main aim of the study was to understand the landscape of the ASM sector in South Africa, its challenges and opportunities, and assess its potential to contribute to socio-economic development.

The following are the specific objectives of the study:

- To review and redefine a framework to categorise ASM activities in South Africa;
- To provide the status of legal and illegal ASM operations in South Africa;
- To determine the economic potential of ASM operations across different commodities using existing case studies;
- To provide insights into the major challenges and successes faced by ASM operations; and
- To provide a description of how the policy/regulatory framework and related interventions have facilitated and/or hindered the development of the ASM sector.

The preliminary study aims to provide a framework for further research on the ASM sector in South Africa. The importance of ASM for socio-economic development in South Africa is elaborated in the White Paper on Minerals and Mining Policy of 1998, which led to the legal provisions to be found in the Minerals and Petroleum Resource Development Act (MPRDA). This importance is echoed at a regional level in the Southern African Development Community (SADC) Protocol on Mining (SADC, 1997) as well as at a continental level in the Africa Mining Vision (AMV) (see Box 1). The AMV is being actualised through a special purpose vehicle called the African Minerals Development Centre (AMDC) and the domestication at member-state level is being done through the Country Mining Vision (CMV) process.

Box 1: Africa Mining Vision

'Transparent, equitable and optimal exploitation of mineral resources to underpin broad-based sustainable growth and socio-economic development'.

Source: African Union, 2009

2. Methodology

The research study consisted of two phases:

Phase 1: Secondary data collection

Secondary data was collected from various sources and consisted of peer-reviewed articles, reports and publications available in the public domain. Information was collected from various stakeholders working in the sector including government departments and related institutions, developmental agencies, provincial government and municipalities. Information was also collected from media sources given the high coverage of some ASM activities over the past few years.

Phase 2: Primary data collection

Key informant interviews were also conducted to obtain insights from various stakeholders working in the ASM sector with respect to the landscape of the sector and key issues that needed to be understood to ensure the sustainable development of the sector. The data was collected through semi-structured questionnaires. Interviews were conducted telephonically, via email correspondence and face-to-face.

3. Definitions

The debate around the definition of artisanal and small-scale mining (ASM) has been going on for many decades, perhaps with more complexity and controversy than necessary. This is probably because ASM means different things to different role-players and stakeholders, and for many of these, the association with a particular understanding implies a particular position towards the sector. The difficulties in defining ASM stem from the fact that the circumstances from which it originates (e.g. in terms of historical, cultural, social and economic) differ from country to country.

Each country has a context-specific definition. The common parameters used by the various countries to define ASM include, inter alia: the level of employment; number of workers for a particular mine; annual production output; capital investment; level of mechanisation; size of claim and depth of mining operation (ILO 1999). Table 1 shows the different criteria used by various countries.

Table 1: Criteria used to define artisanal and small-scale mining in Africa

Country	Criteria
Cote d'Ivoire	Level of mechanisation
Ethiopia	Annual production, level of mechanisation
Ghana	Capital investment, number of participants
Guinea	Type of minerals exploited
Senegal	Depth of working, crude production levels
Tanzania	Capital investment, labour and technology requirements
Zambia	Size of concession
Zimbabwe	Size of concession, capital investment

Source: UNECA (2002)

In the case of South Africa, ASM is often used interchangeably with small-scale mining (SSM) and is defined according to the number of people employed and capital investment. The 'official' definition used by government is adopted from the National Small Business Act of 2003 and defines SSM as a 'mining activity employing less than 50 people, and has annual turnover of less than R 10 million with fixed and moveable assets of less than R 15 million'. The Act recognises ASM as a spectrum and categorises it according to Table 2 below. The first two categories constitute what is known as 'artisanal mining' and includes operations that are associated with the use of manual and/or rudimentary tools (such as picks and shovels). The latter category represents operations that involve mechanisation but on a limited scale when compared to large-scale mining (Mutemeri et al. 2002; DMR 2011).

Table 2: Classification of small-scale mining activities in South Africa

Categories	Total full-time employees	Total annual turnover	Total gross asset value (excl. property)
Micro	<5	< R150 000	< R100 000
Very small	<20	< R3 m	< R1.8m
Small	<50	< R10m	< R15m

Source: National Small Business Act (2003)

It is important to mention that while this definition is regarded as the 'official definition' by government; it is recognised that it does not capture the nuances and complexities of the ASM sector in South Africa (DMR 2011; Kwata 2016). As such, practitioners and researchers working in the sector have attached connotations to the term 'artisanal and small-scale mining' in an attempt to provide a more reflective meaning in terms of what is

happening in reality in the sector against what is captured in policy and legislative frameworks. It is based on this background that we are seeing debates associated with definitions and categorisation, particularly when it comes to the following terms:

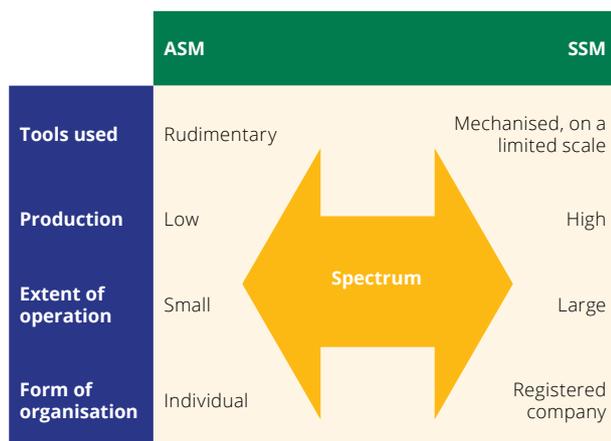
- 'ASM vs. SSM';
- 'legal vs. illegal vs extra-legal'
- 'formal vs. informal'

As mentioned above, these mean different things to different people. However, it is important to come up with common meanings of these terms to reflect the South African context and provide some understanding of what we are talking about when we refer to ASM. It is also important to have a common understanding of ASM to inform ASM interventions towards the management of the challenges and opportunities that the sector presents.

4. Defining ASM in South Africa

Out of the many debates on the definition of ASM, a broad understanding of the sector is emerging. A definition or categorisation that is informed by ground-level issues points to ASM as a type of mining. **If we remove all the connotations attached to ASM, it is simply a 'level of mining' along a continuum in comparison to small-scale and large-scale mining (SSM, LSM).** This means that ASM includes all the activities concerned with the mining value chain from prospecting, ore extracting, processing and trading of mineral product (Mutemeri et al. 2016). As a mining activity, ASM can be described according to the following parameters, but not limited to: tools used, production output, size of operation and level of organisation. The proposed framework therefore categorises ASM in relation to these parameters (see Figure 1).

Figure 1: Framework to categorise ASM as a level of mining



Source: Authors' own

ASM is seen as a spectrum with two extremes, referred to as the lower-end and upper-end. Those located at the lower-end use simple and basic tools (e.g. they

depend on rudimentary tools), their production output is low, the size of the operation is small and these are usually operations run by individuals. On the other side are those that use more machinery but on a limited scale compared to LSM; their production outputs are high and these are usually run by private companies.

In between the two extremes, one can find a range of ASM activities. There is considerable diversity in the ASM sector, as seen through figures 2 to 7 which show the different ASM operations in South Africa. As seen in the figures, these range from operations using rudimentary tools (e.g. picks and shovel) to operations with some degree of mechanisation (e.g. excavators and front-end loaders). Figures 2 to 5 represent what we refer to as those operations located in the lower-end, and Figure 6 and 7 would represent operations at the upper-end.

Figure 2: Coal mining in Nongoma, KwaZulu-Natal



Figure 3: Clay mining and brick-making in Mthatha, Eastern Cape



Figure 4: Gold processing site in Johannesburg, Gauteng¹



Figure 5: Tiger's eye mining in Prieska, Northern Cape



This framework takes no position on legality or illegality; which is determined from the way ASM is practised in relation to the laws and norms of the particular jurisdiction. In South Africa, the challenges and opportunities of the ASM sector are shaped by the historical and current context of mining in the country.

Historically, the earliest references to mining in southern Africa, beyond local extraction and consumption of construction materials, and for making clay-based domestic utensils and crafts, would be linked to the Iron Age and the making of implements for agriculture and hunting. The first known underground mine is at Ngwenya in Swaziland thought to be between 20 000–43 000 years old where the San people mined ochre for rock painting (Jourdan 2014). The Bantu-speaking cultures brought with them mining and smelting of iron. Later there would have been the mining of gold, copper and tin; evidence of which is found in archaeological excavations (Hammel et al. 2000). It has been found that many of the current gold mines in southern Africa are based on ancient workings predating colonisation of the region (Summers 1969). Most of these would have been linked to the Munhumutapa Empire under which the Great Zimbabwe structures of stone were built. In today's terms this would have been artisanal-level mining.

The 'colonial project' brought about big changes to mining in the region. This era was marked by the progressive alienation of the indigenous people from minerals, land and other natural resources. In the early days of colonisation, the self-determined participation of indigenous people in mining was not entirely prohibited. The indigenous people would have participated in mining as claim owners in the colonial set-up and also as workers in what ranged from artisanal to mechanised operations. However, this changed as colonial states became more established and the total alienation of indigenous peoples from minerals became the norm. In this case the participation of indigenous peoples was as labourers and nothing more. In the case of South Africa, this continued into the apartheid era marked by a strengthening of the brutal disenfranchisement

¹ Photo by Janet Munakamwe, Doctoral Candidate, University of the Witwatersrand.

through apartheid legislation. Linked to this was the exclusion of Africans from certain levels of work, prohibition from handling or possessing certain precious minerals, growth of the migrant labour system amongst many other rights-stripping practices of apartheid. The migrant labour system brought in people from neighbouring countries as well as from non-mining areas of South Africa such as the Eastern Cape and parts of KwaZulu-Natal. The current context coming out of this history has two key aspects, which are legal and socio-economic.

The legal context is provided by the current mining legislation in South Africa. The Minerals and Petroleum Resources Development Act (MPRDA) emanating from the White Paper on Minerals and Mining Policy (DMR 1998) was developed to support the redress of past injustices. While this is the case, the MPRDA offers no guidance on the definition of ASM, in spite of the fact that it is defined in the mining policy. However, when reviewing current mining law and regulations, one can glean a framework that does implicitly provide for ASM. This can be determined from the type of provisions under the mining permit licence category. The institutional arrangements relevant to the MPRDA also make reference to artisanal and small-scale mining (e.g. existence of a Small-scale Mining Directorate in the mining ministry, and interventions such as the National Steering Committee of Service Providers to Small-Scale Mining and its successor the Small-Scale Mining Board).

The socio-economic context of categorising ASM in South Africa is linked to the drivers of ASM (e.g. the reasons why people go into in ASM). **The drivers of ASM are predominantly linked to the need for livelihood as well as for commercial reasons.** The commercial activities are those that to all intents and purposes operate like LSM operations in that they have the necessary means to meet the regulatory requirements and are able to fully comply. On the other hand, those at the lower level of ASM struggle to satisfy the legal requirements because they do not have the means to do so (i.e. finance, resources, skills).

The legal framework governing the ASM sector in South Africa is discussed in detail in section 6. **There are two categories of ASM that emerge through the legal lens and that is legal ASM and illegal ASM.**

Figure 6: Verdite operation in Barberton, Mpumalanga

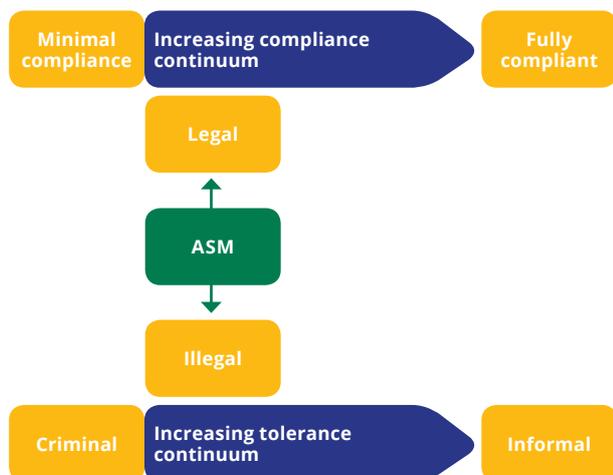


Figure 7: Sand and aggregate operation in Dundonald, Mpumalanga



Legal ASM conducts operations within the documented law (e.g. they are in possession of a mining licence) and illegal ASM practises outside the law. Taking into account the realities on the ground, there appears to be a continuum in the level of compliance of legal ASM (refer to Figure 8). For instance, within the legal domain, one could distinguish between those that are fully compliant with all the legal requirements and those that are not fully compliant. The latter appears to be the case in the ASM sector where very few operators are found to comply with other mining-related legislation such as the National Environmental Management Act (NEMA), the National Water Act (NWA) and so forth.

Figure 8: Illustration of the relationship between different types of ASM found in South Africa when distinguished on a legal basis



Source: Authors' own

A continuum is also observed within the illegal domain. This is linked to socio-economic and political imperatives. The continuum range could best be described as 'criminal' to 'informal' (refer to Figure 8). On the one hand there is 'criminal' ASM, which is often blatantly linked to organised criminal gangs and international crime syndicates, such as that associated with incursions into privately owned operations of LSM. On the other hand there is 'informal ASM'. The term 'informal ASM' is proposed here to refer to ASM that to all intents and purposes is illegal but is tolerated because of the legitimacy inferred by socio-economic and political imperatives. Such imperatives may include

acknowledgment of the need for livelihood for the poor, resulting in a human rights based approach by the key stakeholders such as governments and development practitioners. An example of this is where illegal ASM is undertaken on the basis of permission obtained from traditional and local authorities on land controlled by such authorities. In the case of South Africa, this may include attempts to address the imbalances of the past through formalisation of previously existing illegal ASM operations. For this category to optimally benefit from developmental efforts, guidance needs to be provided on what to refer to as 'informal mining' and the processing of arriving at such a conclusion. This implies a level of specificity in application in determining the level of tolerance to accord legitimacy, which is only possible when all stakeholders are appropriately involved.

The criteria for tolerance should take into account the following:

- The origin and status of the participants;
- Where the illegal activity is taking place in relation to the activities of the rightful owner or occupier of the property;
- Links to criminal activity, for example gangs and international crime syndicates;
- The participants' willingness to formalise;
- Acknowledgement of the rights of the current rightful owner or occupier of the property.

Box 2 provides definitions to some of these terms as understood by the CSMI.

Box 2: Definitions

Legislation

All mining activities in South Africa including ASM are governed by the MPRDA and other attendant legislation (NEMA, NWA, etc.). Mining activities are expected to meet the requirements of the MPRDA and the other laws to be considered legal.

- Legal ASM: ASM practised within documented law (e.g. could be in possession of either a mining permit or a mining right).
- Illegal ASM: ASM practised outside the law (e.g. without the any mining licence).

CSMI further recognises that there is a continuum between legal and illegal ASM were we could have the following categories.

- Legal ASM
 - Licensed and *fully compliant* with all legal requirements
 - Licensed and *not fully compliant* with legal requirements
- Illegal ASM
 - Informal: not licensed but *have permission* from traditional authorities or local municipalities
 - Criminal: not licensed and operating without any permission, *often associated with organised crime*.

4.1. Zama-Zama mining and the ASM framework

'Zama-Zama' is a local term meaning 'we are trying' and is used to describe illegal artisanal miners that work mostly in abandoned and disused shafts in South Africa (Nhlengetwa & Hein 2015). This type of mining is associated with the use of simple tools and methods during mining and processing as seen in Figure 4 above. While it appears that Zama-Zama miners are more advanced than the 'typical' artisanal miners as described above in that they use explosives and have technical mining skills, **Zama-Zama mining still falls within the ASM framework. This means that Zama-Zama is a type of ASM as defined above.**

Zama-Zama mining is associated with high-value minerals, particularly gold. The Chamber of Mines (2017) has reported a spread of Zama-Zama mining activities in other minerals commodities; diamonds in Kimberley, chrome in Limpopo and there is evidence that it is emerging in the coal sector as well. These activities are often linked to people that would have been employed in LSM and would include those that have been retrenched, a product of a mining sector prone to fluctuations in commodity prices and other global economic vagaries. Some of these people have historically come from the labour-sending areas including from neighbouring countries that are part of the migrant labour system. Others are un-documented immigrants from the same neighbouring countries who find themselves in need of a livelihood in situations where their illegal immigrant status is less of a threat. Hence there is a populace of displaced peoples with varying levels of skill and exposure to mining that end up in illegal mining through a variety of channels, but all basically seeking a livelihood.

According to the Chamber of Mines (2017), about 70% of all arrested Zama-Zama miners are undocumented foreign nationals, mostly from Lesotho.² However, it is important to emphasise that not all Zama-Zama miners are foreign nationals, there is a considerable number of South African nationals that participate in this activity.

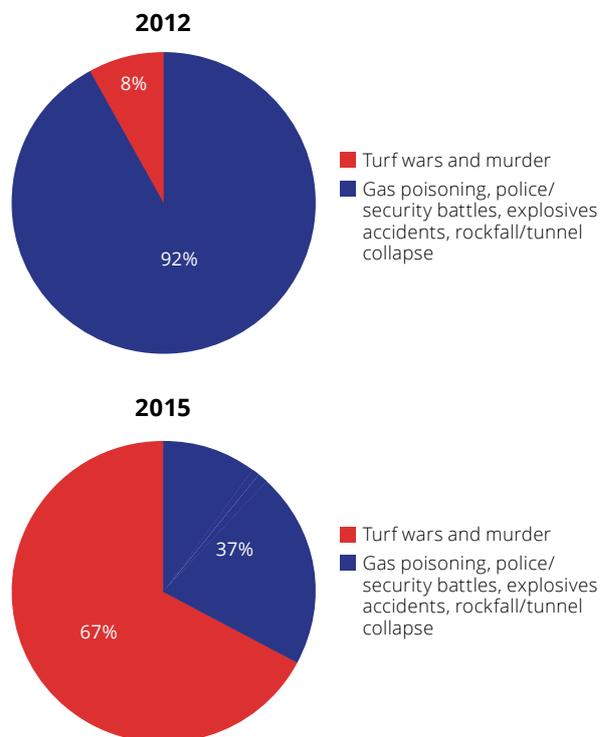
The main issue with Zama-Zama mining in comparison with other forms of illegal mining relates to its association with criminality and organised syndicates as

² Available at file:///C:/Users/A0014885/Downloads/illegal-mining-fact-sheet-31-01-20170.pdf

seen through turf wars and murders, and the large sums of money reportedly paid to access active workings of LSM. Zama-Zama mining first hit the news in 2009 when a tragic accident, which left 87 miners dead, occurred in the Harmony Eland shaft in the Free State.³ Since then, we have seen more deaths being reported from Zama-Zama mining. A total of 347 lives are reported to have been lost between 2012 and 2016 (Johnson 2016). While some of these fatalities are linked to explosive accidents, gas poisoning, security/police battles and rock falls; turf wars and murders are reported to currently be the main cause of these deaths. In 2012, about 8% of the deaths in Zama-Zama mining were associated with turf wars and murders. This has escalated to over 67% in 2015 (see Figure 9) (Johnson 2016).

Recently, 14 bodies believed to be Zama-Zama miners were found in Benoni and it is speculated that the deaths could be related to turf wars.⁴

Figure 9: Reported causes of fatalities in Zama-Zama mining sector in 2012 and 2015



Source: Johnson (2016)

³ Available at <http://www.miningweekly.com/print-version/sa-courts-now-recognise-illegal-mining-as-organised-crime-2009-11-13>
⁴ Available at <http://www.iol.co.za/news/crime-courts/fear-and-loathing-as-14-butchered-in-benoni-8092239>

It is important to note that not all Zama-Zama miners are associated with criminal activities, and that there appears to be a continuum of different types of Zama-Zama mining activities.

Due to the prevalence of Zama-Zama mining in South Africa, it is important to understand how it fits into the ASM categorisation framework proposed in the previous section. From the legal perspective, Zama-Zama mining is illegal ASM. It appears that the application of the term includes both 'criminal' as well 'informal mining'. Where Zama-Zama is not directly linked to criminal gangs it could be accorded the status of 'informal' ASM. On the other hand where there is involvement of crime syndicates, then it is 'criminal' mining. However, as indicated in the ASM categorisation framework, the level of legitimisation and thus the degree of tolerance is situation-specific, and each situation must be assessed on its own merits.

Through research one could map the different Zama-Zama mining activities with the ultimate objective of defining a criteria for tolerance as proposed in the previous section. The research would aim to distinguish between the different types of Zama-Zamas on the

'criminal'-'informal' continuum. This would include distinguishing different working areas, for example active mines, abandoned mines and surface dumps. It would also aim to identify those activities associated with criminality, as opposed to those that are purely subsistence. In addition to the categorisation, understanding all these factors is important in that it would also allow stakeholders to hold informed discussions and engagements in terms of which types of Zama-Zama mining activities to support and which to eradicate. This is in line with the recommendation made by the South African Human Rights Commission (SAHRC) (2015) which related to the need to obtain evidence on the unregulated artisanal mining sector to build trust and networks within the sector. The SAHRC (2015) therefore recommends research that would provide understanding of the size, share, nature and scope of the unregulated artisanal mining sector in South Africa.

It is our view that this particular research is important as a foundation to resolve the challenges in the sector and that everything else (e.g. approaches to integrating Zama-Zama mining into the mining sector; calls for decriminalisation) is secondary to this research.

5. Current status of the ASM sector

5.1. Mineral deposits and ASM potential

ASM operations in South Africa are not restricted to specific mineral commodities. They are allowed to exploit any type of mineral as long as it is within the required provisions of the mining licence. Minerals exploited by ASM range from precious minerals and metals to industrial minerals and construction materials. It is however reported that the bulk of ASM operations exploit industrial minerals such as sand, slate, clay, sandstone, dolerites and granites (Mutemeri et al. 2010; DMR 2011; MHSC 2011). There are some operations that mine high-value minerals particularly gold, diamonds and coal.

The choice of mining a specific commodity is determined by the geology of the area. For instance, the majority of artisanal and small-scale miners in the Northern Cape are mining diamonds and those in KwaZulu-Natal are involved in coal mining. However, high-value minerals are mostly preferred because they have a readily available market, and their profits are high. On the other hand, while industrial minerals and construction materials also have a big market locally, they sell at lower prices. Unlike the case in most African countries, the potential of the ASM sector in South Africa lies within the industrial minerals sector. This is because: most deposits appear near the surface and hence bear the minimum costs of exploitation; the bulk of industrial minerals require less complicated mining techniques; industrial minerals have a high degree of vertical integration; there is a growing local market for industrial minerals and construction materials; and it is also argued that they are neither attractive nor economically viable for LSM (DMR 2011; Tsanwani 2016).

Figure 10 illustrates the set of mineral commodities

mined in each province.⁵ The figure has been included in the report to show that the majority of ASM operations in South Africa actually exploit industrial minerals and construction material as mentioned above. It is interesting to observe that sand is mined in all provinces, making it an important mineral for ASM development. Other popular minerals exploited by ASMs include: stone and aggregate (dolerite), dimension stone, diamond and gold. These minerals are area-specific and depend on the geology and mineralisation as explained above.

Additional information is provided in Appendix B and Appendix C.

5.2. Size, distribution and location

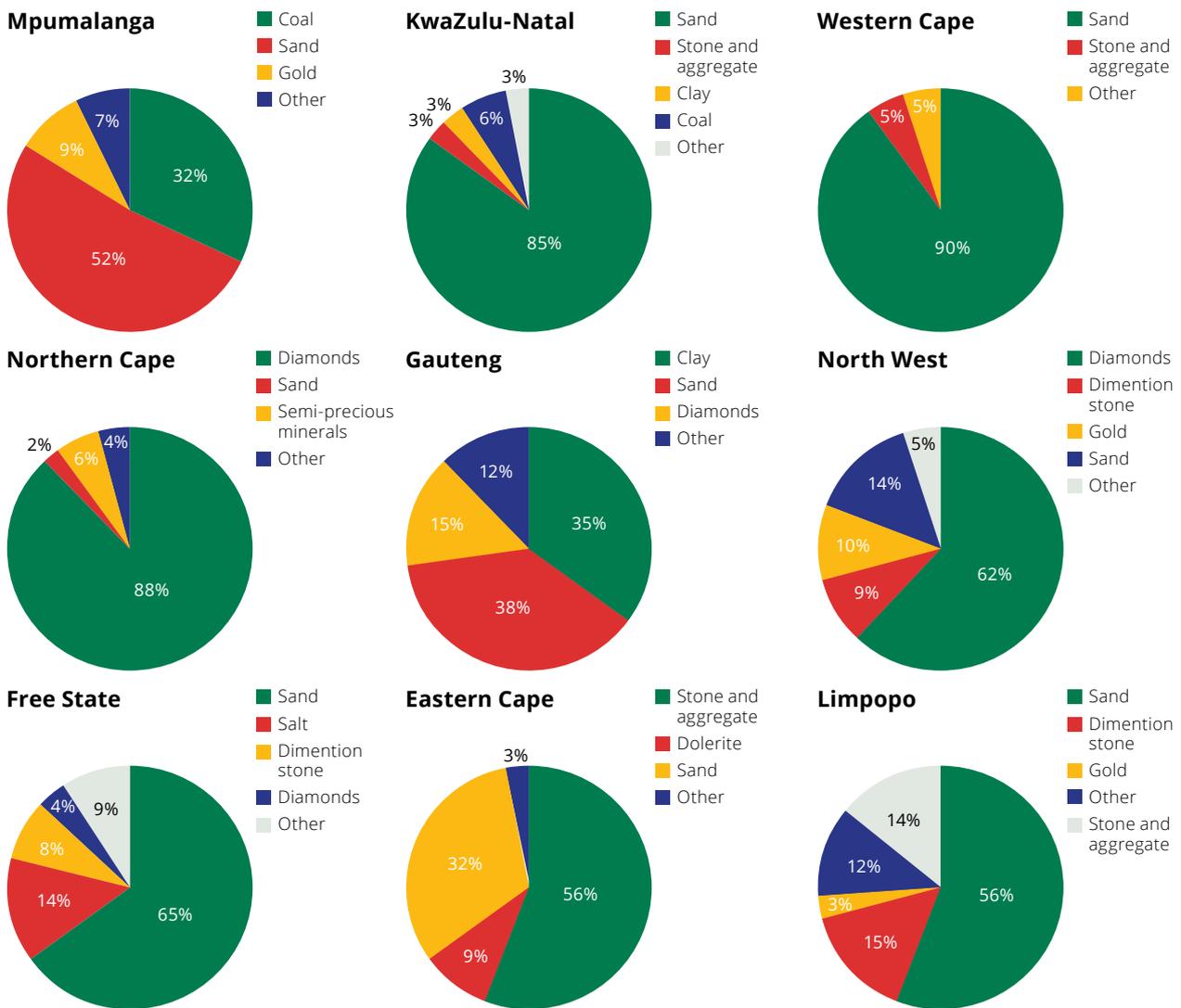
While the number of people working in the ASM sector is unknown, it is estimated that it ranges between 10 000 and 30 000 (Mutemeri & Petersen, 2002; Hoadley & Limpitlaw, 2004; Buxton, 2013). These figures include both legal and informal ASM. Practitioners working in the sector have reported that while they do not have information in terms of the size of the sector, those that practise outside the legal framework far exceeds those with appropriate mining licences. The Mine Health and Safety Council (2011) estimated the number of registered small-scale mines⁶ to be 1 030. It is unknown how many people these operations employ. The Department of Mineral Resources (DMR) is reportedly in the process of developing and verifying the number of miners and/or operations who are active in the country.

Figure 11 provides the data collected to date by the Small-Scale Mining Directorate, which is responsible for ASM in

⁵ The mineral profiles were mapped from the database provided by the DMR which contained lists of mining permits that have been issued by the department in the various provinces

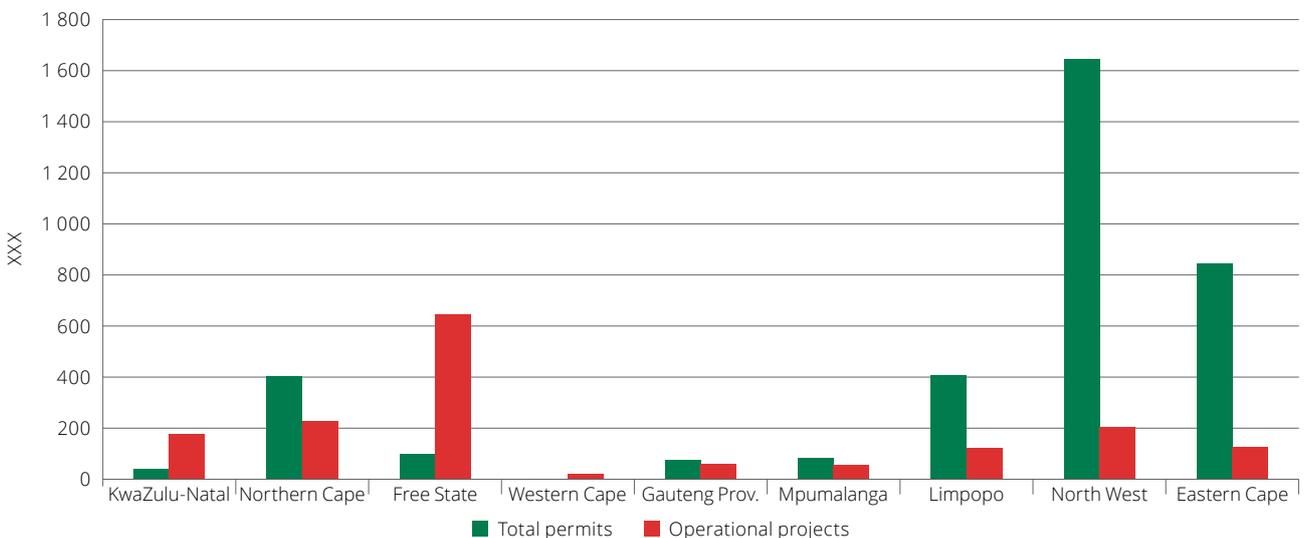
⁶ Small-scale mines defined by the MHSC according to the 'official definition' employed by government (e.g. the National Small Business Amendment Act, 2003).

Figure 10: Minerals exploited by legal ASM operations across South Africa



Source: DMR

Figure 11: The number of mining permits and operational ASM projects according to provinces



Source: DMR (2016)

the DMR. The figure shows the number of mining permits that have been issued by the department and the number of operational projects in the various provinces.

As seen in the figure, there are discrepancies between the number of mining permits that have been issued and the number of operational projects. In some provinces, such as KwaZulu-Natal and the Free State, the number of mining permits is fewer than the number of operational projects. This could imply that most of the projects are operating without mining permits. In some provinces, such as Limpopo, North West and the Eastern Cape, there are large numbers of mining permits and few operational projects. This could mean that the majority of operations that have been issued with mining permits are not in operation and this could be attributed to a number of factors, which may include the lack of financing for equipment and machinery. The discrepancies may also be linked to the DMR's methodology for collecting this information.

However, According to the DMR (Kwata 2016a), the provinces with the highest number of ASM activities include the Northern Cape, North West, Mpumalanga and KwaZulu-Natal.

The data that is available does not allow for a complete assessment. It would be interesting to understand the demographic profiles in the sector, particularly in terms of gender, age and nationality. A significant number of women are known to be involved in ASM activities. In the various African countries, women constitute as much as 50% of the workforce (e.g. in Ghana and Malawi) (Buxton 2013). In the case of South Africa, the number of women working in the ASM sector was estimated to be less than 5% in a study conducted in 2001 (Dreschler 2001). This is expected to be higher since the sector has been opened up to disadvantaged groups including women.

The participation of women in the ASM sector is partly driven by the loss of jobs in the agricultural sector in rural areas. Further, the ease of entry into the ASM sector has made it easier for women to consider ASM as an alternative source of livelihood. While this may be the case, there is no ground-level evidence to confirm this. There is a need for further research in order to understand the role played by women in the ASM sector.

5.3. ASM and socio-economic development

From a socio-economic perspective, ASM activities play a significant role in the economy. In some countries, ASM contributes to national revenue through its total mineral production (e.g. Ghana, Tanzania and the DRC). According to the World Bank (2013), ASM operations contribute 80% to the global sapphire production, 20% to gold production and 20% to diamond production. Additional benefits from ASM activities include: rural development, market linkages, natural resource management and mineral diversification.

At a local level, ASM creates employment and self-employment opportunities for many people, particularly in rural areas. ASM also stimulates the production of goods and services directly used in the production process such as tools, equipment and diesel, and supporting or indirect goods and services such as housing and food, and this in turn increases the local purchasing power of communities (UNECA & AU 2009).

The ASM contribution to livelihoods in South Africa is unknown. There is currently no research that provides a picture of the contribution of the ASM sector to the economy either at the macro or micro level. **There are a few anecdotal studies with some evidence suggesting that ASM activities are an important source of livelihood for communities. These studies have also revealed that there is a considerable number of women that depend on ASM for a livelihood** (Phakathi 2016). Unfortunately, these dimensions cannot be unpacked because there is little data available in the literature.

Nonetheless, South Africa recognises the ASM sector as a tool to create jobs and alleviate poverty, particularly in rural areas. This was raised by the DMR in its strategic document, which seeks to promote and advance the development of ASM into a competitive, dynamic and sustainable sector, to facilitate job creation and poverty alleviation in rural areas (DMR 2011). In addition, the ASM sector is recognised because of its potential to contribute to:

- Rural development;
- Women and youth development;
- Market linkages;
- Mineral diversification;

- Local mineral beneficiation;
- Small, medium and micro-sized enterprise development;
- Establishment of small local industries;
- Mainstreaming historically disadvantaged South Africans into the formal economy; and
- Skills transfer to local communities.

This potential is yet to be realised in South Africa. There is an obvious need to conduct research that would determine the current and potential contribution of ASM to local livelihoods and economic development in South Africa. There are guidelines that one can use to determine the contribution of ASM at a household level and even at a community level (e.g. World Bank Toolkit for Baseline Studies in Africa).

5.4. Challenges facing the sector

As is the case in many developing countries, the ASM sector in South Africa is considered complex owing to a myriad social, environmental and economic challenges, some of which have to some extent contributed indirectly to the precarious conditions in which miners find themselves in. These include, inter alia, an inadequate policy and legislative framework; costs associated with regulatory and administrative obligations; lack of financial resources and limited market opportunities; limited technical capacity and access to appropriate technology; lack of institutional support; insufficient training opportunities; lack of information; and insufficient government capacity. These are discussed below.

Legislative requirements and the costs thereof: In line with the MPRDA and NEMA, artisanal and small-scale miners are required to meet requirements with respect to environmental-management plan authorisation, consultation with the landowner/occupier and affected parties, financial provision for land rehabilitation, and proof of technical ability. These requirements carry hefty costs mostly requiring the service of professionals with high consulting fees – creating a financial barrier most miners cannot overcome. The application process has also been criticised because it is onerous and time-consuming – it can take more than six months to obtain a mining permit. In addition, applications are completed online, disadvantaging those in rural areas without access to computers or the internet. These barriers have forced the majority of miners to operate outside the legal framework.

The lack of financial resources: Lending to the ASM sector has always been considered risky by financial institutions. In South Africa, in particular, ASM operations have always depended on government and related organisations to provide channels for funding. One such channel was the NSC programme, which was set up to provide technical and financial support to ASM operations (refer to section 7). Presently, there are very few institutions that offer financial support to miners, but these include a few development agencies. The Eastern Cape Development Corporation (ECDC) assists with the filling in of the business plans and feasibility studies required to source funding, and the Small Enterprise Finance Agency (SEFA) provides loans to small and medium-sized businesses, from R50 000 to the maximum R5 million. However, providing the collateral to secure these loans prevents many miners from accessing them.

The availability of markets: The lack of resources usually limits the operations from investing in a proper market study. The majority of the operations depend largely on surrounding communities as their principal markets. Finding markets is usually done haphazardly and unsystematically (Mutemeri & Petersen 2002), and most operations depend on word-of-mouth as their main marketing tool. While some countries (e.g. Ghana, Zimbabwe, Bolivia, Peru) have established buying facilities to serve as markets for ASM operations, we have not seen such interventions in South Africa (Mutemeri & Petersen 2002). Although the Department of Trade and Industry in South Africa has several platforms that assist small to medium-sized enterprises with market access, particularly to foreign markets, these are yet to be explored by the ASM sector, mainly because of the resources required (Mutemeri & Petersen 2002).

The lack of appropriate technology and skills: Most ASM activities rely on manual labour and basic tools for mining and processing. With a considerable percentage of the miners not having a formal education, the lack of skills in the sector is still a major concern. Low-level skills have resulted in poor practices, inefficient mining techniques, poor working conditions, lack of compliance with and understanding of government regulation, poor adherence to mine health and safety requirements, and damaging environmental impact.

Institutional support: The lack of structures to adequately support ASM operations is a concern. While

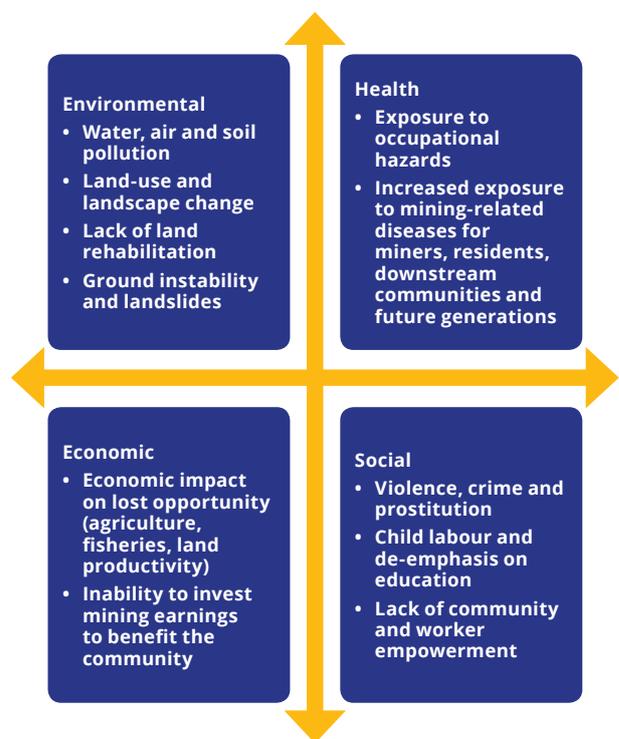
there are a number of stakeholders who could potentially carry forward the responsibility of supporting ASM development in the country, in practice the work they are doing is not having a significant impact on the sector. The question is why? There is a need to conduct research which would assess the role and responsibilities of these organisations; the support they provide to the miners; and the accessibility and adequacy of those services. The research should investigate the capacity of those structures in supporting the sector and the relationships between these structures. What is not clear is the relationship between these different stakeholders; it appears that they work in silos and there is a duplication of responsibilities. The research should investigate these in relation to the current challenges facing the sector in order to identify key areas for intervention. Again, most of these structures are located at a national level, and very little intervention is seen at the local level. It appears as if ASM is not part of local economies because the available literature shows minimal representation from local and municipal government. All these issues need to be investigated because it is clear ASM plays an important role in local economies and should be included in all integrated development plans (IDPs) and local economic development (LED) projects.

This section has provided insight into the sector's challenges – how to transform the sector as well as address the environmental, health and safety concerns. Figure 12 captures the negative impact of ASM activities, whose costs are borne directly by the miners themselves – such as poor working conditions and substandard health and safety conditions – as well as by surrounding communities in the form of environmental degradation,

exposure to diseases, ground instability and landslides (Hoadley & Limpitlaw 2004; Collins & Lawson 2014). The negative impacts of ASM come out very strongly in policy responses and general discussions on ASM. In fact, the negative impact of ASM takes precedence over its positive benefits. This is not surprising since, as mentioned above, ASM's contribution to local economic development is unknown. It could also be argued that the degree of negative impact of ASM is also unknown.

It is our view that we need a proper understanding of both the negative and positive impact of ASM activities.

Figure 12: Negative impact associated with ASM activities



6. ASM legislative framework

An important aspect of the development of the ASM sector is the policy and legislative framework as it pertains to the whole mining value chain, which should cover exploration, ore extraction, processing, beneficiation, value-adds and marketing. In addition, it would also take into account attendant issues such as the environment, health and safety, and socio-economic impact.

The MPRDA is the primary legislative instrument for the management of the ASM sector in South Africa, supported by other laws, such as the National Business Amendment Act, National Environmental Act, Mine Health and Safety Act, Air Pollution Act, Explosives Act and the Water Act. In critiquing the ASM policy and legislative framework in South Africa, the main objective is to ascertain how the current framework has affected the development of the sector thus far. It is also important to determine whether the legislation has supported the broad aspirations of the White Paper on Mineral and Mining Policy of South Africa (1998) and the specific ASM policy statements therein contained. Further, the legal provisions for ASM in South African mining legislation can be compared to those in other African countries (refer to Appendix A). This is a useful exercise in light of the current implementation of the Africa Mining Vision (AMV) and the domestication through the Country Mining Vision (CMV) process (UNECA and AU 2009; Pedro 2016).

Here follows a summary of the key ASM provisions contained in the various mining laws in the different countries, including South Africa.

Categories of licence: One finds that some African mining laws distinguish between artisanal mining and small-scale mining – hence there is an artisanal mining

(AM) licence category that is separate from small-scale mining (SSM). This is true for the DRC and Sierra Leone, and a few other countries such as Liberia, Malawi, Guinea and Mali. The AM licence gives permission to explore and mine, but the SSM licence has to be preceded by exploration of the respective area. There are also some countries (Tanzania, Ghana) which, like South Africa, have one licence category for the whole range of operations, from artisanal to small-scale mining. **It is important to note that the MPRDA does not explicitly state that the mining permit is for small-scale mining operations as is mostly assumed. Anyone can apply for a mining licence, meaning that the MPRDA does not restrict the level of mining to different types of licence (in other words, an artisanal miner can apply for a mining permit or even a mining right).** The assumption mostly made is that, because the requirements of a mining permit are less onerous and expensive compared to those of a mining right, mining permits are for artisanal and small-scale miners. And, in fact, the majority of ASM operations working within the law are in possession of mining permits. However, it is important to note that there are also ASM operations in possession of mining rights.

Eligibility restrictions: Most African countries reserve the AM licence for their citizens. In most of these countries, foreigners are permitted to hold equity in entities that apply for a SSM licence, but the level of shareholding is restricted. For example, in Sierra Leone foreigners are not allowed to have equity greater than 25%. Permitting foreigners to participate in SSM allows for the necessary investment of capital into the sector which local entrepreneurs may not have. South Africa, however, does not restrict eligibility for mining permits to South African nationals. **It is our view that restricting some mining activities to locals would allow locals a**

competitive advantage, and would also create opportunities for government to implement ASM-related social programmes.

Limitations on where a licence can be issued: In certain countries, these limitations come in the form of provisions for designated ASM areas. In the DRC, artisanal mining is only permitted in areas designated for AM exploitation. This is true of Mozambique, Mali and Guinea as well. In South Africa, apart from general restrictions on where a mining licence can be issued (protected areas, existing mining rights), there are no other restrictions. An entity or individual is free to apply for a licence in any area that is 'open'. As pointed out above, **South Africa should consider making provisions for ASM development in designated zones, particularly in areas with high concentrations of ASM activity. Designated areas can be advantageous in managing negative ASM impact, bringing together resources and increasing the efficiencies of sector support programmes.**

Duration of the validity: The terms of ASM licence duration differ from country to country. In the case of both the DRC and Sierra Leone, the AM licence is valid for one year, but can be renewed. The SSM licence ranges from three years in Ghana to ten in the DRC, with provisions for renewal. In South Africa, a mining permit is valid for two years, with the allowance for renewal making the total five years. Considering that the mining permit is the licence for the whole range of mining activities from artisanal to small-scale, the total validity of five years seems rather short and makes it unattractive for financial institutions to finance ASM operations. It should however be noted that in South Africa a mining right, with the maximum validity of 30 years, permits all ASM operations. It is important to remember that the mining right is more onerous and stringent compared to mining permits. This is due to its requirements in terms of environmental impact assessments and management plans, social and labour plans and mining work programmes, which in most cases are beyond the reach of artisanal and small-scale miners. There is a proposal in the MPRDA Amendment Bill to increase the mining licence's duration to a total of seven years after renewals.

Aerial extent allowed: The aerial extent refers to the maximum area for which a licence is granted. Again, this differs from country to country. In some countries such as Tanzania, this is not specified in law. In South Africa,

the maximum area extent for mining permits is 5 hectares; this has been increased from 1.5 hectares. The 5-hectare area has been criticised because it does not accommodate other mineral commodities, particularly those that are considered 'high bulk' minerals such as sand, sandstone and granite.

Depth restrictions: The depth restrictions are imposed as measures to mitigate against the safety risks of miners operating at this level. These also serve to manage the risk of sterilising deposits lying deeper than at the permitted depth. Other operating restrictions imposed on ASM operations include the level of mechanisation and the use of chemicals and explosives, particularly for the AM licence category. The South African mining permit does not impose depth restrictions on mining excavation as is the case in Sierra Leone for both the AM and SSM licence and for AM permits in the DRC. However, even though the MPRDA does not limit mining permits to surface operations, ASM in South Africa is characterised by operations that mine on or near the surface, and are presumed to work with non-complex deposits that require simple extraction methods (DMR 2011).

Transferability, leasing or mortgaging: The South African mining permit has similar conditions to AM licences in many other African countries in that it cannot be transferred, leased or mortgaged. These restrictions may affect the feasibility of commercial ventures based on this category of licence, making them unsuitable for funding from mainstream financial institutions. On the other hand, the SSM licence in some African countries is treated as property that can be transferred, leased or mortgaged, and therefore is more amenable to investment in commercial ventures.

Mineral trading: In many of the African countries, there is a special licence for trading in AM-produced minerals. This special mineral trading category allows locals to participate as well introduces some level of control by regulatory authorities. Such arrangements have been used to manage the chain of custody for 'conflict minerals' (diamonds, gold, coltan and cassiterite) in countries like the DRC, Sierra Leone and Liberia. In countries where a distinction is made between AM and SSM, the rights of the latter licence-holders often include permission to freely trade the mineral product, including for export. In South Africa there is no special licence permitting trade in the minerals produced from a mining permit, with the

exception of gold and diamonds. ASM operations involved in the extraction of industrial minerals and construction materials do not need a licence to trade their products. These markets are open to everyone, although still dominated by medium to large-scale operations. The level of beneficiation is high in the ASM sector. For example, sand miners produce bricks, and sandstone miners produce tiles for cladding.

Environmental management: In many of the other African countries where there are separate AM and SSM licences, the requirements for SSM are very similar to those for LSM, although sometimes less onerous. On the other hand, AM licence requirements are very basic, sometimes nothing more than a general undertaking to mine responsibly. In the case of countries like the DRC, responsibility for the environmental management of designated AM zones lies with the government. The miners' contribution comes from the 10% of their AM permit application fee that is allocated by government for the environmental management of designated AM zones. South African legislation has attempted to make the obligations for environmental management less onerous by simplifying the process for developing and implementing environment management plans for mining permits. Linked to this is the lodging of a

rehabilitation deposit or guarantee with government. **While the requirements for a mining permits are considered less onerous, anecdotal evidence suggests that for a lot of the artisanal and small-scale miners wanting to get into the sector, the capacity to meet these requirements is still quite low. This is considered the biggest hurdle in the sector.**

Safety and health: The approach towards safety and health taken by many of the other African countries is similar to the approach towards environmental management. While the AM licence only requires an undertaking to mine responsibly, the SSM licence has more stringent provisions. In South Africa, the occupational health and safety requirements for a mining permit are almost as stringent as those for a mining right.

In summary, the provisions for ASM in South Africa are comparable to those in other African countries, with some pertinent differences. **Some of the provisions present challenges and barriers with respect to administration, regulation and compliance, and prove to be counterproductive to the development of the sector.** The key considerations for a possible optimisation of mining legislation are summarised in Table 3.

Table 3: Key considerations for possible optimisation of the legislation

Provision	Description
Definition	Recognising that there is a spectrum of ASM as a level of mining and this continuum should be reflected in and supported by legislation.
Categorisation of ASM activities	Considering separating artisanal-level operations from small-scale operations, with options for upscaling to the next level; Being explicit in legislation about the provisions for artisanal mining and small-scale mining .
Local participation	Creating designated zones for ASM operations. These could be guided by the level of ASM activities in the different provinces, and the concentration of specific mineral commodities in particular provinces (e.g. sandstone in QwaQwa, Free State; tiger's eye in Prieska, Northern Cape).
Duration of validity	Increasing the duration of the mining permits in line with the requirements of financial institutions, and also taking into account the life cycle of mining operations.
Aerial extent allowed	These should be determined by the size of a mineral commodity.
Environmental management	See benefits of designated zones.
Safety and health	See benefits of designated zones.
Support for ASM	Matching the legislative provisions with the requisite institutional framework for realisable goals (e.g. to ensure that the right support is afforded to the ASM sector and that it addresses legislative requirements).
Other related legislation	Aligning the different laws (NEMA, NWA, MHSA, etc.) with the MPRDA, and providing the necessary support to ensure universal compliance.

7. ASM support in South Africa

Section 1.4.4.2 (clause vii) of the White Paper on Minerals and Mining Policy of South Africa states that:

The capacity of the DME will be enhanced to efficiently facilitate small-scale mining support on the broad spectrum of activities involved in such endeavours. The DME will further facilitate the establishment of a self-sustaining institutional support mechanism for small-scale mining.

Over the past two decades, government has established several programmes to address the challenges in the sector as a way of facilitating growth. Figure 13 provides a timeline of specific programmes for the ASM sector against some of the major developments in the mining industry.

The Department of Mineral Resources (DMR) (previously the Department of Minerals and Energy) has been the leading agent in the development of the ASM sector in South Africa. Most of the programmes were spearheaded by the DMR in collaboration with other key role-players in the sector. Some of the flagship programmes include the National Small-Scale Development Framework (1999), National Steering Committee of Service Providers (NSC) (2000), Small-Scale Mining Directorate (2004) and the Small-Scale Mining Board (2006).

The principal objective of these initiatives was to provide support to ASM projects in the form of technical, managerial and financial assistance (Dreschler 2001; Mutemeri & Petersen 2002; Mutemeri et al. 2010; DMR 2011). The role of the National Small-Scale Mining Development Framework was to provide the miners

with the necessary technical and financial assistance to ensure the success of their operations. The NSC emerged from the National Small-Scale Mining Framework to help identify potential projects and provide support in the form of technical assistance, raise finance and assist in the development of bankable feasibility studies (Dreschler 2001; Mutemeri et al. 2010; Solomons 2012). The NSC comprised of multiple stakeholders including Mintek, Council for Geoscience, Minerals and Energy Policy Centre, Industrial Development Corporation (IDC), South African Diamond Board, Khula Enterprise Finance, Ntsika Enterprise Promotions, Community Public Private Partnership and the DMR. It is not clear how many projects were supported through the NSC, but an article published in 2015 in *Mining Weekly* reported that an amount of R15.1 million was allocated to the programme and assisted 20 projects.

Unfortunately, the NSC programme was disbanded in 2005 due to its failure to produce viable projects and was replaced by a new structure called the Small-Scale Mining Board (SSMB) in 2006. With similar objectives, the SSMB programme was established to provide services required by the ASM sector. According to Tsanwani (2016), a total of 171 projects were supported through the SSMB programme, and targeted projects included co-operatives, individuals and communities and these included both mining and beneficiation projects. The SSMB programme was also disbanded and its responsibilities shifted to the Small-Scale Mining Directorate, which was established in 2004 to serve as a dedicated structure for ASM within the DMR.

At present, the support given to both aspirant and existing miners includes, inter alia: the establishment of a legal entity, guidance towards the identification of

mineral deposits, legal and contractual arrangements, reserve estimation of the selected deposits, mining feasibility study and market studies.

In parallel to the government-led programmes, various organisations also initiated a number of programmes to support the development of ASM. Some of these programmes include:

- The Mining Qualification Authority (MQA) offers qualifications, learnerships and skills programmes to small-scale miners (Solomons et al. 2012). The qualifications are registered with the South African Qualifications Authority and are offered within the National Qualifications Framework. The MQA has trained well over 2 000 people across South Africa.
- The Small-Scale Mining and Beneficiation Division at Mintek was founded in 2002 following a need for the research and development of appropriate ASM technology.
- The ASM Training School at Mintek provides training to artisanal and small-scale miners in the areas of health and safety, geology, mining and processing, and beneficiation.
- The Zenzele Technology Demonstration Centre was established in 2002 to provide technical and research support to ASM and mineral-related enterprises. This programme was born within the Small Enterprise Development Agency, which assists small and medium-sized enterprises in South Africa. The demonstration centre supported various projects in Mpumalanga, Gauteng, KwaZulu-Natal, the Northern Cape, Free State and the Northern Province across different mineral commodities including gold, diamonds, copper, coal, various industrial minerals including clays, feldspar and mica as well as dimension and ornamental stone.

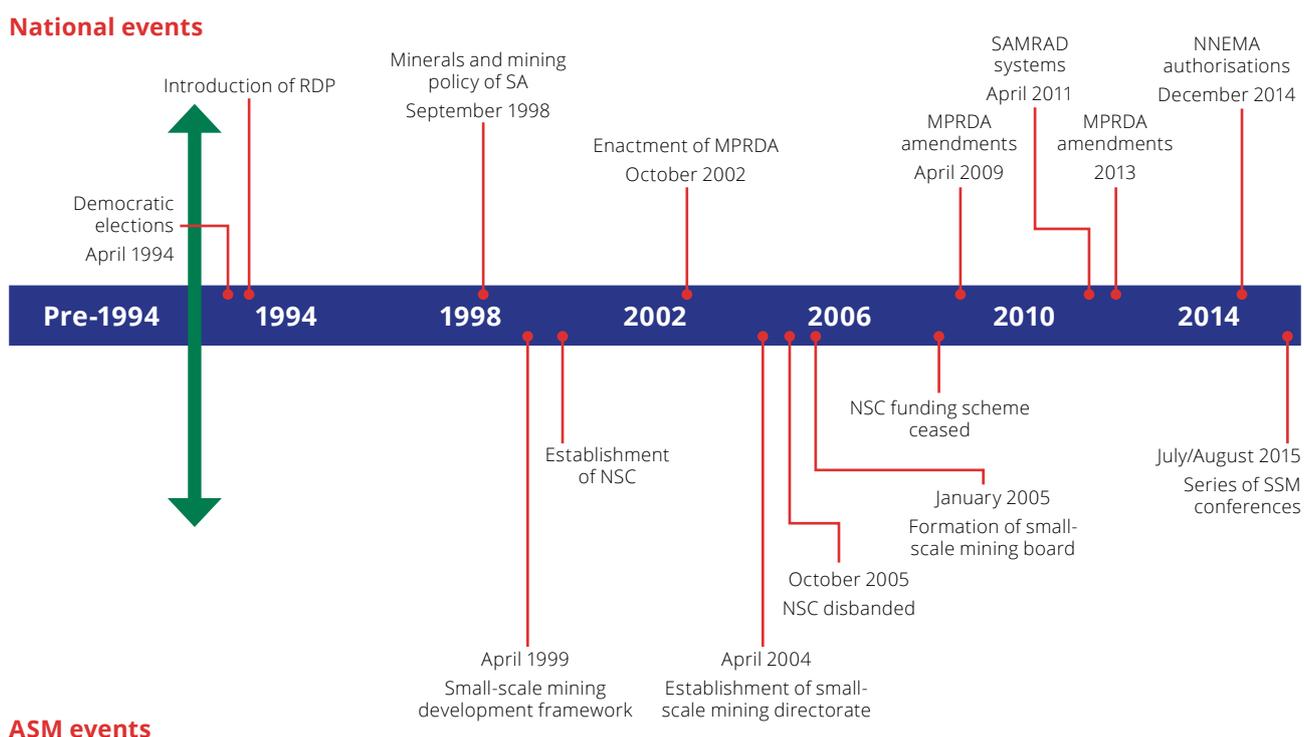
- The Council for Scientific and Industrial Research (CSIR) has also supported the ASM sector in the form of technology and mining-method development through its Miningtek division.
- There are also a number of other programmes which were initiated by other stakeholders at both provincial and local levels. Some of these organisations include: The Department of Trade and Industry, the Department of Labour, development agencies (Eastern Cape Development Corporation, Limpopo Economic Development Agency), financial institutions (Ntsika and the Industrial Development Corporation), local and district municipalities (Northern Cape government), and LSM operations (De Beers, Samancor) (Dreschler 2001).

While these programmes may have improved the operations of some ASM projects, they appear to have made an insignificant impact on the sector (given the sector's status). The impact of these programmes is yet to be determined because very little assessments or analysis have been conducted in this area. It is important to note that most of the above mentioned programmes have been disbanded and it is not clear as to why that is the case (see Table 4). The dearth of research on these interventions warrants a research study which would assess the impact of these programmes on the sector, to draw lessons and suggest recommendations for future ASM programmes. The impact assessment should also include those programmes that still exist in order to determine how adequately they address the sector's challenges.

Table 4: Summary of past and existing interventions to support the ASM sector in South Africa

Name of programme	Organisation	Objectives	Programme status
National Small-Scale Development Framework	Department of Mineral Resources and other stakeholders	To provide small-scale miners with the necessary technical and financial assistance to ensure the success of their operations	Disbanded
National Steering Committee of Service Providers	Department of Mineral Resources and other stakeholders	To identify potential small-scale mining projects and provide support to produce viable projects	Disbanded
Small-Scale Mining Directorate	Department of Mineral Resources and other stakeholders	To work in conjunction with the NSC to support the small-scale mining sector.	Disbanded
Small-Scale Mining Board	Council for Geoscience and other stakeholders	To provide services required by the small-scale mining sector (refer Table 7)	Disbanded
Small-Scale Mining Directorate	Department of Mineral Resources	To provide non-financial support to small-scale mining operations	Still exists
ASM Training School	Mintek	To provide outcome-based training to small-scale miners.	Still exists
Zenzele Technology Demonstration Centre	SEDA	To provide technical and research support to small-scale mining and mineral-related enterprises.	Disbanded
Miningtek	CSIR	To develop the mine plans and the technology for small-scale mining projects.	Disbanded
Minerals, Energy, Education Training Institute (MEETI)	Minerals and Energy Policy Centre	To provide training courses to small-scale miners	Disbanded
Ntsika Enterprise Promotion Agency		To provide non-financial support in the form of training and capacity building	Disbanded
Community Public Private Partnership Programme		To promote the establishment of rural and collectively owned enterprises	Disbanded

Figure 13: Developments of ASM in South Africa

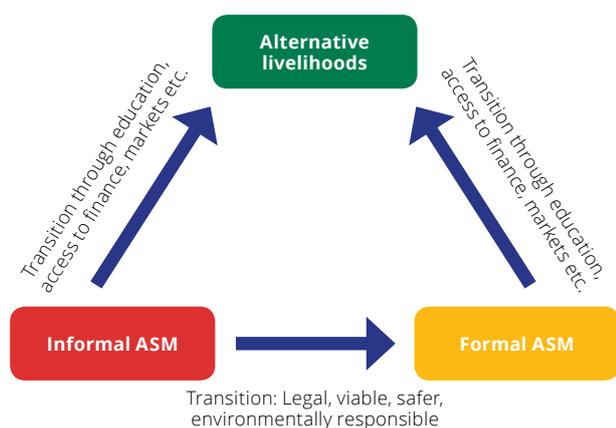


8. Recommendations

As mentioned above, a large percentage of ASM activities are characterised by informal activities and this has hindered the potential of the sector to be realised. While it is believed that the sector has potential, the question is how South Africa can translate this potential into job creation, poverty alleviation and rural development.

An important part of this transformation framework is the golden triangle for supporting ASM development, which includes access to finance and markets and extension services, for improved performance of ASM operations (Jourdan 2014). Figure 14 presents the ASM triangle of transformation that can be used to formalise the sector in South Africa.

Figure 14: ASM triangle of transformation



Source: Mutemeri et al. (2016)

As mentioned above, the ASM sector in South Africa is shaped by its socio-economic context and comprises of those who cannot afford to formalise (e.g. poverty-driven ASM activities) and those who can (e.g. entrepreneurial ASM activities). This is represented in the figure, where those who cannot afford to formalise usually find

themselves on the left-hand side operating informally. Formalisation in this context is defined as the process of integrating informal mining activities by recognising local arrangements in legislation, reducing barriers to legalisation, and creating clear benefits from participating in the formal system (McQuilken & Hilson 2016). The need for support services is also crucial for transforming the ASM sector.

As a signatory to the African Mining Vision (AMV), South Africa should be guided by its key tenets – to transform the ASM sector through holistic and integrated formalisation programmes that acknowledge that minerals are a finite resource and therefore need to be transformed into more sustainable forms of capital for alternative sustainable livelihoods (Mutemeri et al. 2016). South Africa should consider a targeted domestication of the AMV focusing on ASM. This process requires baseline data of the sector, a consultative process during the policy and legislative framework development as well as the monitoring and evaluation of the implementation. The process will facilitate the visioning necessary for developing a policy and legislative framework for the ASM sector to achieve the desired developmental outcomes.

Box 3 is an extract from the AMV and outlines its key tenets on ASM. It also provides the objectives of the African Minerals Development Centre (AMDC) and its scope of work towards realising the set goals for ASM.

Other guidance could also come from the Intergovernmental Forum (IGF) on Mining, Minerals, Metals and Sustainable Development released a guidance document on managing ASM. The IGF guidance document on ASM provides recommendations on how governments can govern their ASM sectors to ensure that they contribute to sustainable

development relating to: creating clear legal frameworks and regulatory mechanisms to facilitate the organisation of ASM; providing technical support to build capacity of

government or other bodies tasked to regulate and support the sector; and developing and replicating formalisation strategies on the basis of lessons learnt.

Box 3: African Mining Vision

The AMV's key ASM tenet: Harnessing Artisanal and Small-Scale Mining – Integrate sector to improve rural livelihood; Integrate sector to improve rural economy, upgrade skills, technology, etc.

The AMDC Results Area on ASM:

- The Goal is to create a mining sector that harnesses the potential of artisanal and small-scale mining to advance integrated and sustainable rural socio-economic development
- Key actions include **developing policies, laws and regulations** that promote a viable and sustainable ASM sector, and where possible to embed ASM into broad-stream rural development strategies. It also seeks to develop programmes to upgrade the **knowledge, skills and technologies** used in the ASM sector, and generally to develop **institutional capacities** that support a viable ASM sector.
- The outcomes will be:
 - A viable and sustainable artisanal and small-scale mining sector;
 - Strengthened capacities of ASM operators; and
 - Reduced negative environmental, health and welfare impacts from ASM.

9. Key stakeholders

Key informant interviews were conducted to obtain additional insights and ground-level information on ASM activities in South Africa. Knowledgeable stakeholders with ASM experience were targeted for the interviews. To collect the data, semi-structured questionnaires were prepared to gather information from legal artisanal and small-scale miners and from organisations working in the sector (see Appendix D and E).

A list of legal ASM operations obtained from the DMR was used to purposively select operations to participate in the interviews. The different operations were selected based on the mineral commodities and their locations. They were selected such that there is some level of representation across different minerals commodities and also to ensure sufficient regional representation. All interviews were conducted telephonically. Given the time and budgetary constraints, only eight operations were interviewed and these are captured in Table 5.

In addition, interviews were conducted with a number of key organisations working in the ASM sector. These

interviews were conducted telephonically, via email correspondence and face-to-face. The following organisations were represented in the interviews:

- Department of Mineral Resources (four regional offices);
- Council for Geoscience;
- Mining Qualifications Authority;
- Mintek;
- Minerals and Energy Policy Centre;
- Eastern Cape Development Corporation;
- Zenzele Technology Demonstration Centre;
- Prieska Protocol; and
- Independent consultants.

The data collected from key informant interviews was transcribed and analysed to identify the main points emerging from the content and in line with the objectives of the study. It must be noted that no data assessment tool or software was used to analyse the responses. The main points were identified through content analysis of the

Table 5: Sample of ASM projects

Mineral commodity	Province	Status of operation
Sand	Limpopo	Operational
Dolerite/Aggregate	Limpopo	Operational
Sandstone	Free State	Operational
Alluvial diamond	Northern Cape	Non-operational
Tiger's eye	Northern Cape	Operational
Sand	KwaZulu-Natal	Operational
Sand	Mpumalanga	Non-operational
Salt	Free State	Operational

responses provided by different stakeholders. The subsequent sections provide a summary of the main points captured in the interviews with artisanal and small-scale miners (note that these operations had all been issued with mining permits and include a spectrum of operations) and the various organisations working in the ASM sector.

9.1. Artisanal and small-scale miners

Of those interviewed, six were in operation and two were not in operation. The main points captured from the interviews with artisanal and small-scale operations are summarised below.

Number of people employed: The number of people employed by each operation differs. The operations reported to employ between four and 27 employees.

Female participation: Most of the operations indicated having female workers in their operations.

Scale of operations: Most of the operations are involved in both mining and value addition (e.g. beneficiation). For instance, sand operations use the sand for brick-making, and the dolerite is mined and crushed to produce different size aggregates.

Dependency on mining for livelihood: The majority of the operations indicated that mining was their only source of income.

Challenges facing the operations: The funding provided by government was inadequate to cover all operation requirements. They could not afford critical machinery and were forced to procure second-hand equipment and machinery and this led to inefficiencies as they could not access the high-grade material required by the markets. Illegal mining was also raised as a critical challenge particularly for those mining sand. One operation reported that there are a lot of people mining sand without proper licences in Limpopo and that the government has failed to close down these illegal operations. Legal sand miners are forced to compete with those mining without the proper licences and this has a negative impact of their operations. They are struggling to compete with illegal operations for markets because those mining illegally sell their materials at lower prices. The operation also raised concerns about the manner in which the police deal with these cases, alleging that the police are also involved in illegal sand-mining ventures. The other challenges raised by the miners are: the difficulty in renewing mining permits, market availability, cash-flow problems and high input costs.

9.2. Supporting institutions

The responses from the interviews with various organisations are captured in Table 6.

Table 6: Responses from the various stakeholders working in the sector

Main theme	Key points raised
1. The size and nature of the sector	<p>While most stakeholders don't have verifiable statistics on the size of the sector, the following information was provided:</p> <ul style="list-style-type: none"> • The majority of small-scale mining activity takes place illegally. • Gauteng has the largest number of illegal mining activities compared with other provinces. • There are also significant illegal mining activities in the sand and diamond sectors.
2. Provinces with high levels of ASM activity and minerals exploited by ASM	<ul style="list-style-type: none"> • Northern Cape – mostly alluvial diamonds • Free State – sandstone • North West – alluvial diamonds and dimension stone • KwaZulu-Natal – coal
3. Challenges facing ASM operations	<p>The challenges facing the ASM sector include:</p> <p>Legal</p> <ul style="list-style-type: none"> • Legislative requirements • Costly application process • Limited mining extent (e.g. area extent of 5 hectares does not encourage funding from private sectors) • ASM treated the same as large-scale mining • Inappropriate regulating policies • Lack of a national strategy for ASM • Lack of political will to support ASM • ASM is often overlooked and not included in national agendas <p>Financial</p> <ul style="list-style-type: none"> • Access to financial assistance • Start-up capital • Exploitation by investors <p>Marketing</p> <ul style="list-style-type: none"> • Market access <p>Skills and training</p> <ul style="list-style-type: none"> • Business and financial management skills • No mining knowledge <p>Institutional support</p> <ul style="list-style-type: none"> • Absence of structures to assist the miners • No support from the private sector <p>Other challenges</p> <ul style="list-style-type: none"> • Access to exploitable deposits • Lack of understanding of the nature of ASM in the country • Lack of research on ASM • Community conflicts • Environmental degradation
4. The role of different stakeholders	<p>The services provided by the different stakeholders include:</p> <ul style="list-style-type: none"> • Technical services (e.g. mineral potential investigations, compilation of geological documents, mineral deposits identification, desktop studies, planning and management, and borehole core logs and information) • Assistance with the application process (e.g. relevant information required to lodge an application) • Public administration (e.g. assistance for small-scale miners to correctly interpret and apply legislative requirements) • Offer advice through all the stages on how to respond to legislative and DMR's internal administrative requirements • Facilitates skills development in the ASM sector (e.g. Small-Scale Skills Development Programme) • Train, develop and support small-scale miners through research and development of appropriate technologies • Identification of skills needs for ASM • Compilation of training programmes for ASM • Provision of technical and business training, guidance and support

Main theme	Key points raised
5. Programmes to support the development of the ASM sector	<p>Programmes to support the ASM sector include:</p> <ul style="list-style-type: none"> • Mintek in collaboration with the MQA have developed a small-scale mining qualification • MQA provides funding for training • MQA and Mintek currently training 300 beneficiaries in small-scale mining in Mpumalanga • DMR provided financial assistance to small-scale miners; however, this programme was stopped • Council for Geoscience provides commodity information to miners
6. The potential of the ASM sector	<p>All stakeholders that were interviewed indicated that the ASM sector in South Africa has potential. The following areas/mineral sectors were identified as 'potential areas':</p> <ul style="list-style-type: none"> • There is potential to reprocess mining dumps (e.g. gold and coal dumps) • There is potential in dimension stone, coal, gold and diamond mining. • In the Free State province the potential lies in sandstone mining and beneficiation and salt production. • In Mpumalanga, the mining areas with potential are the Sabie, Graskop, Komatipoort, Witbank and Caroline regions.
7. Strategies for promoting the ASM sector	<p>In working towards the development of the ASM sector, the different stakeholders recommended the following:</p> <p>Legal</p> <ul style="list-style-type: none"> • Relax stringent laws and policies • Good governance policies • Remove hindrances in the application process • Simplify licensing processes • Apply more flexible financial requirements to lower required rehabilitation guarantees • Increase mining periods to allow investments • Decrease time-frames for issuing mining licenses • Introduce health, safety and environmental laws <p>Financial</p> <ul style="list-style-type: none"> • Funding assistance from the private sector • Financial availability (e.g. start-up capital) • Development of an investor guide to attract investors <p>Marketing</p> <ul style="list-style-type: none"> • Assist with access to markets <p>Skills and training</p> <ul style="list-style-type: none"> • Provide training (business management and technical) • Assist with procurement of machinery (post training intervention) <p>Institutional support</p> <ul style="list-style-type: none"> • ASM support-structure development • Promotion of ASM through workshops • State interventions through the National Development Plan <p>Other recommendations</p> <ul style="list-style-type: none"> • Provide access to mineral deposits • Environmental issues should not be blindly pushed without considering the needs of poor informal miners • Provide information on suitable deposits for ASM exploitation • Convene a meeting with all government stakeholders and beneficiaries to discuss ASM support
8. Key role-players in the ASM sector	<p>The different stakeholders identified the following organisations as key role-players in the ASM sector:</p> <ul style="list-style-type: none"> • Department of Mineral Resources • Council for Geoscience • Small Enterprise Development Agency (SEDA) • Industrial Development Corporation (IDC) • Mining Qualification Authority • Mine Health and Safety Council (MHSC) • State Diamond Trader • Small-scale miners • End-use markets

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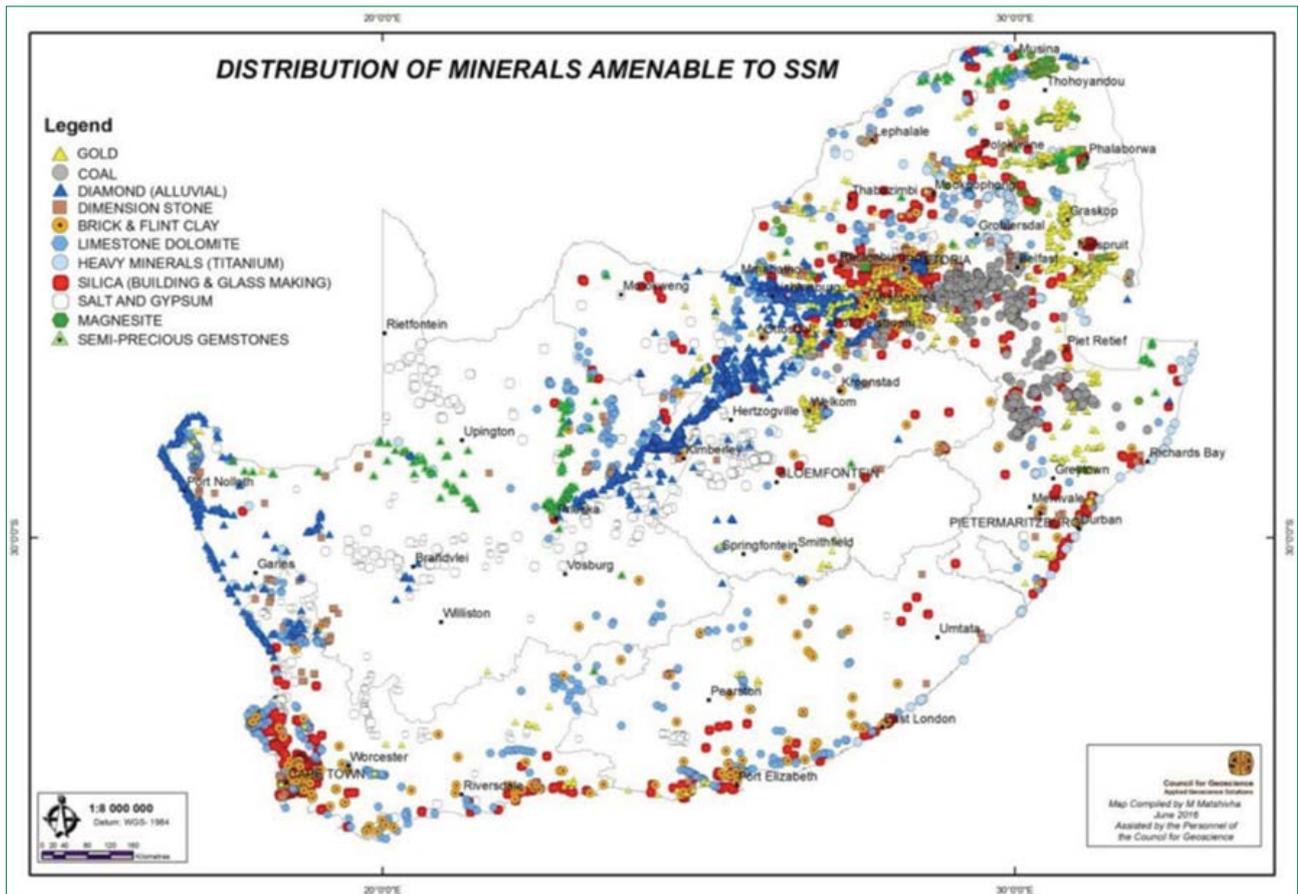
Tanzania (2010) Mining Act

Appendices

Appendix A: Comparative analysis of ASM provisions in African mining legislation

Provision	Democratic Republic of Congo	Tanzania	Sierra Leone	Ghana	South Africa
Principal law	Mining Code, 2002	Mining Act, 2010	Mines and Minerals Act, 2008	Minerals and Mining Act, 2006	Minerals and Petroleum Resources Development Act, 2002
Categories of licence	1. Artisanal: Artisanal Mining (AM) Exploitation Card 2. Small-scale Mining (SSM)	Primary mining licence (covers all ASM activities)	1. ASM 2. SSM	SSM (covers all ASM activities)	Mining Permit (covers all ASM activities)
Eligibility by nationality	1. AM only for nationals. 2. SSM entity applicant must be owned 25%	Only nationals	1. AM only for nationals. 2. SSM entity applicant must be owned 25% by nationals	Only nationals	No restrictions
Where licence/permit can be issued	1. AM Miners card to be issued for working only in specific designated AM areas. 2. SSM no restrictions	No restrictions, can mine any area where licenced	1. AM licences to be issued for areas only in specific designated AM areas. 2. SSM no restrictions	No restrictions, can mine any area where licenced	No restrictions, can mine any area where licensed
Validity	1. AM 1 year renewable as long as designated area for which it is granted exists is 2. SSM <10 years including all renewals	7 AM-1 year renewable 3 times	1. AM-1 year renewable 3 times 2. SSM-3 years renewable indefinite times	<5 years renewable at Minister's discretion	2 years, renewable 3 times for a 1-year period each time

Appendix B: Distribution and list of minerals suitable for ASM exploitation



Appendix C: List of mineral commodities suited for small, medium and micro enterprises (SMMEs) in South Africa

The following criteria was used to classify these minerals involved:

1. Capital requirements needed to start operation
2. Regulatory factors relating to polluting substances (e.g. acid producing wastes) released during the operation and the control thereof

Commodity	Suited for SMMEs	Exploitation by SMMEs questionable	Not suitable for exploitation by SMMEs
Aluminium		✓	✓
Antimony		✓	✓
Arsenic			✓
Barite	✓		
Cadmium			✓
Chromium	✓	✓	
Coal			✓
Cobalt			✓
Copper			✓
Corundum	✓		
Diamond			
Alluvial diamond	✓		
Kimberlite diamond	✓		
Dimension stone			
Granite		✓	✓
Marble	✓	✓	
Slate	✓		
Quartzite	✓	✓	
Sandstone	✓		
Flagstone	✓		
Verdite and soapstone	✓		
Dolomite	✓		
Evaporates			
Salt	✓		
Soda and soda ash		✓	✓
Potash		✓	✓
Boron		✓	✓
Bromine		✓	✓
Fluorspar	✓		
Garnet	✓		
Gemstone	✓		
Gold			
Witwatersrand		✓	✓
Other rock-hosted		✓	✓
Unconsolidated sediments	✓		

Commodity	Suited for SMMEs	Exploitation by SMMEs questionable	Not suitable for exploitation by SMMEs
Industrial minerals			
Aggregate	✓		
Andalusite	✓		
Clay and brickmaking	✓		
Gravel	✓		
Kyanite	✓		
Perlite	✓		
Phlogopite	✓		
Pumice	✓		
Road construction material	✓		
Sand	✓		
Silicon and silica		✓	✓
Silimanite	✓		
Stone and dimension	✓		
Talc and pyrophyllite	✓		
Wollastone	✓		
Zeolite	✓		
Iron	✓	✓	
Kieselguhr	✓		
Lead			✓
Limestone	✓	✓	
Magnesite/magnesium		✓	✓
Manganese	✓	✓	
Mercury			✓
Molybdenum			✓
Nickel			✓
Oil and gas			✓
Other carbonaceous fuels			
Peat	✓		
Lignite	✓		
Oil shale		✓	✓
Pseudo coal		✓	✓
Pegmatite minerals			
Beryl	✓		
Bismuth	✓		
Columbium	✓		
Feldspar	✓		
Lithium	✓		
Mica	✓		
Tantalum	✓		
Niobium	✓		
Platinum Group Metals		✓	✓
Phosphate		✓	✓
Rare earths minerals		✓	✓
Silver		✓	✓
Thorium		✓	✓
Tin	✓		
Titanium	✓	✓	

Source: Adapted from Wipplinger (2006)

Appendix D: List of questions to small-scale miners

1. Are you still in operation?
2. If no –
 - a. When did you close your operations? How long had you been in operation?
 - b. Why did you close the operation?
 - c. How many people did you employ? Any females?
 - d. What are some of the challenges your operation faced?
 - e. Did you receive any assistance government and/or related supporting institutions? Which stakeholders did you approach?
 - f. What type of assistance do you want?
3. If yes –
 - a. Do you have a valid mining licence?
 - b. How long have you been in operation?
 - c. What mineral/s do you mine?
 - d. Do you beneficiate your minerals or sell them as raw material?
 - e. How many people does the operation employ? Any females?
 - f. What are some of the major challenges your operation is facing?
 - g. Have you received any assistance from government and/or related supporting institutions?
 - h. What sort of assistance do you require?

Appendix E: List of questions to supporting stakeholders

1. How big is the ASM sector in South Africa?
2. What is your role in the small-scale mining sector? How do you support ASM operations?
3. Could you provide information on your intervention programmes? What is the status of those programmes?
4. What sort of mineral commodities are ASMs most attracted to and where are they mostly located (which provinces have high ASM activities)?
5. Does the sector have potential? Where is the potential?
6. What are some of the major challenges facing the sector?
7. What needs to be done to promote the ASM sector in South Africa?
8. What are some of the key areas for intervention?

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