

Formalization of a roadmap to maximise the contribution of artisanal and small-scale mining in Zimbabwe

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In Zimbabwe, artisanal and small-scale mining (ASM) is predominantly in gold mining and has contributed significantly towards mineral output and a source of livelihood for many communities. It is crucial for countries having some of its citizens relying on ASM, to formally recognize this sector and work towards making ASM sustainable. In Zimbabwe, several ideas for formalizing ASM have been implemented but the assumed benefits have not yet been fully realised. This paper argues that for formalization to make an impact, an integrated approach founded on understanding stakeholder needs, the demographics of the ASM, provision of appropriate training and a structured coordination of the sector would increase the sustainability of formalization programmes. These programmes would have to be supported by strong political will and robust, capacitated implementing institutions. Built on these arguments, a formalization roadmap is proposed to ensure the ASM sector brings its anticipated benefits to all stakeholders.

Keywords: Artisanal and Small-Scale Mining, formalization roadmap, sustainable development, Zimbabwe

INTRODUCTION

Artisanal and small-scale mining (ASM) contributes significantly to poverty reduction as well as adding to the total output of minerals. Although there are some difficulties in quantifying its contribution to sustainable development and livelihoods, ASM represents a quick process to generate revenue especially for miners involved in the mining of gold and semi-precious minerals. However, ASM is still regarded by some as unprofitable, dirty, dangerous and fundamentally unsustainable based on the belief that the activity represents the greatest environmental disaster-in-the making, (Dreschler, 2001).

Regardless of whether ASM contributes to sustainable development or not, it is possible that it will continue to thrive for as long as poverty exists. In the past, ASM has experienced a significant expansion worldwide, especially in developing countries. It is estimated that the sector has approximately 20-30 million people directly involved in ASM, producing 15-20% of the world mineral output (Buxton, 2013). Pact (2015) estimated that ASM is a direct source of livelihood for approximately more than 1 million people during a scoping study of the ASM sector in Zimbabwe. The numbers for Zimbabwe are increasing, given that two decades ago only 0.5 million people were directly working in ASM with an estimated number of dependents of around 3 million (ILO, 1999; Mutemeri & Peterson, 2002; Hinton, 2005). Despite such significant growth, ASM activities continue to operate largely informally.

The informal nature of ASM activities is generally attributed to lack of control over problems associated with the sector. Some of the key problems associated with the sector include environmental degradation, child labour, high crime rates, sexually transmitted infections and conflicts. Geenen

(2012) and Verbrugge (2015) have also highlighted this characteristic of ASM operations taking place in informal environments.

The other side of the coin suggests that ASM has numerous benefits. Hilson and Maconachie (2017) suggest some of these positive benefits include producing a significant share of the world's minerals; tens of millions are directly employed and millions more jobs are created in the upstream and downstream industries it spawns. In addition, it has become a driver of economic development in numerous rural economies. Due to the advantages of the ASM sector, Hentschel, et. al., (2003) suggested that it is therefore crucial to maximize the favourable contributions enabled and brought about by ASM.

Mawowa (2013) showed that there is a strong relationship between the progression of the ASM sector and overall economic growth and development of a country. Generally, ASM growth is prominent when the economic situation deteriorates. The current Zimbabwean economic situation makes ASM an important alternative to many unemployed Zimbabweans. Due to the importance of the ASM sector, the government of Zimbabwe and other international development communities have rendered assistance in several forms to the ASM sector in order that maximum benefits are realised from the ASM activities.

There is a need therefore to establish a more formalised ASM sector in Zimbabwe to enable maximum production of ASM activities and to establish sustainable development within the sector. In this paper we will focus on developing and proposing a formalization roadmap for the ASM sector in Zimbabwe. The roadmap is aimed at assisting government, policy makers and donors to effectively and efficiently support the operations of artisanal and small-scale miners for a better livelihood and maximum realisation of benefits in this sector. ASM forms a significant part of the economic support system for rural Zimbabweans who depend on it as a means of survival.

The remainder of this article is structured as follows: Section 2 of the article describes the different conceptualizations of ASM formalization; Section 3 focuses on the discussion, consolidation and synthesis of various literary bases used in the development of the formalization roadmap and Section 4 provides conclusions and remarks based on the roadmap.

ANALYSIS OF CONCEPTUALIZATIONS OF ASM FORMALIZATION

The impetus to formalise ASM has been mainly from donors and governments. This thrust has grown principally from a growing realisation of ASM's economic contribution, the significance of improving regulations to address problems associated with ASM (environmental and social) and gaining of greater control of its activities. One of the early advocates of ASM formalization, Davidson (1993), proposed that the realisation of mining rights was one of the crucial steps towards growth in ASM. Several countries, including Zimbabwe, have legislative and licencing structures for ASM and Siwale & Siwale (2017) argue that a large share of the postulated formalization paybacks hinges on how the idea is constructed and actualized.

In viewing formalization, Spiegel (2015), points out that the process and sense of formalization is disputed and can probably mean different things in several contexts and at different times. Understanding of formalization can be grouped into two classes, the narrow and the broad view of the process. The narrow view is connected to the legalist school and mostly to the writings of Hernando De Soto. This school focuses on the acquisition of legal title and argues that formalization is thus an outcome that ends with the granting of title. Siwale & Siwale (2017) indicate that a key weakness of De Soto's claims, including those of the legalistic school, is a too limited concentration on legal title as the key that opens access to a fully operational free market.

According to Heemskerk (2005), the broad view of formalization can be conceptualized as the process of registering, organising, and tracing mining activity in the field. Following this logic, formalization is

therefore regarded as an effective intervention approach that introduces interaction with miners, and facilitates the collection of valuable data to guide intervention by government and international development agencies. This view is more comprehensive with title acquisition being viewed as an early step that is then followed by later steps for ASM development as compared to the legalist school which only emphasise legal title. Lowe (2005) also introduces a popular definition of formalization as: Formalization speaks not only to the presence of legislation, but to the activation and enforcement of it by authorities.

The broad view of formalization is therefore the key approach utilised in this study as it views the process against a broader perspective.

KEY AREAS OF ASM FORMALIZATION

Scoping/demographical Analysis

It is clear that lack of understanding of a process or activity can lead one to misjudge the process and eventually failing to make justifiable conclusion on matters concerning the process analysed. Hilson (2005) reviewed the work of several researchers who have strongly concluded that the unfavourable outcomes of the ASM technology and support-related initiatives pursued in the past were inseparably connected to a poor understanding of prevailing conditions on the ground. Hilson indicated that until basic population data is collected, sustainable livelihood initiatives in the ASM sector are likely to fail in their attempts to facilitate marked improvements in this impoverished sector.

The non-existence or lack of geological and anthropological information on ASM inhibits most governments both from refining the regulatory framework for the sector, and also from delivering more effective facilities and extension services to its operators (Hilson & Maponga, 2004). In their article, the authors examined closely how a shortage of baseline census and geological data has repressed industry formalization and undermined numerous measures employed to tackle the problems associated with different ASM sites. Hilson & Maponga (2004, p. 22) state that "Specifically, it is argued that insufficient knowledge of artisanal mining populations - including their demographic structure - and of areas suitable for ASM activities affects the ability of a government to regularize, as well as to improve, the organization of this largely informal sector of industry".

The findings of Sauerwein (2017) supported the impression that it is critical to have a thorough understanding of the individual characteristics of the ASM sector during the design and implementation of an operational formalization strategy. Examples of information outlined include a national census, particularly on the size and revenue streams in ASM, and also a better consultation with the sector's communities during the design of policies. It is therefore necessary to adopt a bottom-up approach in ASM formalization from the start.

D'Souza (2000) and United Nations Environment Programme (UNEP) (2012) have suggested that, with regard to financing, governments should allocate funds to collect baseline information on ASM communities, to design and implement undertakings related with ASM needs (Siwale & Siwale, 2017). This is vital in facilitating institutional and relationship building as well as facilitating training and the provision of assistance for the development of projects applicable to ASM miners. Hilson & Maconachie (2017) indicate that for many governments to be able to actively pursue any programme related to ASM formalization, they must first gather the necessary information to formulate effective and efficient decisions.

It is also important to note that information pertaining to the reasons why many of the ASM miners choose to operate informally can be obtained during the undertaking of baseline studies.

The role of Education in ASM

In most cases, ASM practices are performed poorly resulting in its full benefits not being realised. Some of the causes of poor ASM practices include lack of education for miners, zero or no technical assistance, poverty, financial difficulties, ineffectiveness and constantly moving from place to place. Linked to these poor practices are negative impacts that result from ASM operations. These impacts include, but are not limited to, river siltation, deforestation, mercury pollution, no sustainable communities and tax avoidance. It is therefore necessary to invest much more in education and training so that the ASM sector is run and operated by individuals with a better appreciation of things that matter.

Much of the activities by government, the international community and researchers regarding the development and improvement of the ASM sector in Zimbabwe, has been mainly advocating for monitoring, legalization and technical assistance for the sector. Recently, the international community has initiated some community-related projects to support sustainable livelihoods, resulting from issues related to poverty and child labour within the sector. Most of the work in the ASM sector has been geared towards monitoring and legalization of the sector with education and technical assistance usually being overlooked (Veiga, 2014). Zimbabwe is not an exception in relation to this observation. What then is the reason for this?

The Shamva Mining Centre was established in 1989 as a collaborative initiative between the Zimbabwe Ministry of Mines, the Intermediate Technology Development Group (ITDG), the Small-scale Miners Association of Zimbabwe (SSMAZ) and donors (Department for International Development, European Union, and German Technical Cooperation Agency (GTZ)) (Dreschler, 2001). The Centre provided a custom milling facility for miners as well as offering training in health, safety and sustainable mining methods. At present, the Centre no longer exist in the form it was originally intended to be as a result of poor management. Dreschler (2001) indicated, from lessons learnt from the failure of the Centre, that small-scale miners, like any other entrepreneurs, also need a complete set of business development services to flourish and grow. It was also indicated that miners require, in addition to technology, expertise in business management and planning, mining methods, maintainable environmental management and knowledge about access to credit and profitable markets.

Maponga & Ngorima (2003) also indicated that even though some studies highlighted that gold miners and panners are generally knowledgeable about existing regulations, continuous education programmes are essential in relation to new technology and ASM. The authors also suggested that regional training centres and demonstration courses facilitated and financed by the private sector and government would also enhance compliance.

However, extreme effort in terms of educating and training individuals in the ASM sector has not been fully implemented in Zimbabwe. This is evident from the information revealed during a scoping study executed by Pact (2015) in the Kadoma and Shurugwi regions of Zimbabwe. In terms of miners' skills in mining-related work, more than 70% of the miners testified that they were unskilled (Pact, 2015). *Figure 1* shows a summary of the information obtained in relation to miners' training skills and experience in gold production in Zimbabwe. However, this cannot be unique only to gold mining but can be true for all the minerals mined in the ASM sector in Zimbabwe.

Bugnosen (1990) outlined that many countries have, in their files, detailed geological maps and a great deal of mineral resource information, but further highlighted that this crucial information is not normally accessible to the artisanal and small-scale miner. However, the author stated that, even if this information were available, it is normally presented in difficult technical terms not easily digested by the small-scale miner and consequently is of no use to them.

This lack of technical knowledge probably results in small-scale miners employing guesswork in their operations. This can only be addressed if the miners are offered some technical knowledge and education.



Figure 1. Zimbabwe Miners' training skills and experience in gold (Pact, 2015).

In order to transform the ASM into a more formal sector, there is first a need to transform the miner into a more responsible individual. This is possible through education and training. Education basically involves all the experiences that are acquired inside or outside the school by an individual. Turkkahraman (2012, p. 38) points out that: Society and education complete each other. Society cannot carry on without education and vice versa. Education affects not only the person being educated but also the whole community by starting from his/her family. In other words, raising sufficient number of efficient people for more prosperous society is the duty of education and educational institutions which have certain functions in the community. Burchi (2006) also argues that education can play a pivotal role in two separate ways, namely economic production and social change.

Since ASM is generally associated with poor practices in mining, drug abuse, HIV/Aids, environmental degradation and pollution and smuggling of minerals, without miners' being educated and trained, the formalization initiatives will only result in formalizing inappropriate operations as miners will be reluctant to alter their methods of operating.

ASM organisation

Studies by individual authors, the international community and governments on ways of harmonising and developing the ASM sector into a more responsible and sustainable activity, has been extensively addressed.

An analysis of existing studies (UNEP, 2012; Sandhu, 2016; Zvarivadza, 2018) has been utilised as a basis to recommend how ASM activities can be effectively organised for formalization results to be realised in Zimbabwe.

Acknowledging the existence of ASM sector

As long as poverty exist within communities, ASM will continuously grow and it is therefore critical for governments, with persistent ASM activities, to recognise the existence of this sector and its importance as a source of income. Favourable policies in relation to trading in the minerals and the ownership of claims should be developed and implemented to enable ease of doing business.

Ideas of fully recognising and motivating ASM miners can also be enriched by drawing from Frederick Herzberg's well known two-factor theory, promulgated in 1959. The theory emphasises an understanding of what motivates people in all walks of life. It is based on two needs: the need to avoid unpleasantness, and the need for personal growth. Herzberg stated that the need to avoid unpleasantness is satisfied by hygiene factors that have to do with the environment and conditions of work (including: working conditions, quality of management, organisational policy, administration, interpersonal relations, job security and salary). Insufficient hygiene factors cause dissatisfaction, e.g., in the case of ASM in Zimbabwe there is still smuggling of gold indicating dissatisfaction with the current trading conditions offered by Fidelity Printers and Refiners (FPR) of Zimbabwe.

Most managers (government employees in this case) focus on these hygiene factors, yet the need for personal growth (ASM miner personal growth), which Herzberg stated as effective in motivating an individual to outstanding performance and effort, is satisfied by motivator/satisfier factors (including: status provided, opportunities for advancement, level of recognition by management (government), responsibility and sense of achievement obtained from the job itself). Therefore, government should ensure basic hygiene factors are provided (policy framework, capacitation, proper administration and monitoring of ASM etc) and also move a step up in ensuring that motivator factors are enhanced e.g. decriminalisation of ASM as was done in 2013 (enhancing status of ASM), ensuring opportunities for advancement of ASM miners and also making it clear to ASM miners that they have a huge responsibility of boosting the country's total mineral produce.

Regulatory Frameworks for ASM

ASM should always be included in the economic development activities in Zimbabwe as it has proved to be a provider of employment and booster of mineral output, particularly gold as 2017 ended with ASM contributing 53% of the total output. The ASM sector is unlikely ever be formalized under the same legal schemes applicable for large scale mining, and therefore special legal provisions for formalizing ASM should be developed (World Bank, 2004). The laws and regulations should address the challenges of ASM, simplify registration procedures and also enhance the moderation of the negative impacts of ASM to the environment.

Decentralization of government structures regulating ASM

Several factors, including unfavourable government policies, bureaucratic registrations processes and strict mineral trade measures can hinder the willingness of ASM players to operate legally. Registration of claims and gold buying licences should be simplified to improve accessibility to licencing for ASM. This implies that registration offices must be established in several districts to enable easy access by miners. Government should also develop a communication feedback mechanism in cases where licencing is delayed to improve accessibility to the various licences required by law.

Promoting coexistence of ASM and agriculture/farming

Several authors have indicated that ASM is a poverty-driven activity that has inseparable links /connections with small scale farming (Almaden, 2015; Banchirigah and Hilson, 2010). It is therefore critical for the government to build a framework how ASM can sustain agriculture within similar communities. ASM centres can be established and given land for farming activities and also development of other facilities such as schools and social structures which ultimately increase revenue and reinforce sustainability.

Tracking and reporting mineral production and sales

Government should also put in place measures to track all mineral movement and ensure that all miners bring their produce to responsible government authorities, thereby curbing smuggling. It is still reported that some of the gold produced in Zimbabwe by ASM is smuggled across the borders; and yet there are border control units in place to police minerals. Zimbabwe also has a police officer at each gold processing mill, but black market activities still continue. This is an indication of informality and government should modify existing controls or put in place new measures to address these inadequacies.

Steering ASM cooperatives

Formalization can easily be enhanced by government establishing cooperatives within the ASM sector and fully supporting them with financial, technical and training facilities. Government can evaluate resources required to establish the satellite cooperative and facilitate training of members. Associations are easy to monitor, have very low chances of dishonesty, can enable coordination among miners and bring a conducive environment for capacity building. Successful examples of such models that can be adopted include the Mwanza Regional Miners Association (Tanzania) and also the Tanzanian Women Miners' Association (TAWOMA) (UNEP, 2012). TAWOMA is actively involved in identifying market links, creating favourable environment for relationships between small and large-scale miners, advocating for and training small scale miners as well as giving input to legal reforms.

Geological mapping of zones amenable to ASM.

Small-scale miners sometimes encroach into the claims owned by large-scale mining (LSM) operations. This is because LSM are able to buy large tracts of land and the ASM sector is usually left with smaller and poorly mapped areas. Government should engage in activities of mapping areas suitable for ASM.

Improvement of ASM environmental practices

ASM activities, in general, negatively affect the environment where they operate. It is therefore vital to focus on issues such as increased awareness about mercury exposures and hazards, establishment of environmental management training, making environmental training a prerequisite for accessing hire-purchase loans for equipment and making environmental impact assessments (EIA) mandatory before any mining project can be undertaken.

Enhancement of ASM health and safety practices

It is also important to integrate issues of drug abuse, and HIV/Aids into the environmental training programmes as most miners tend to engage in unsafe activities related to these issues.

Encouraging social responsibility among ASM

Social responsibility is an ethical framework which suggests that an entity, be it an organization or an individual, has an obligation to act for the benefit of society as a whole. ASM activities should also be encouraged by the government to act in a socially responsible manner. This can be facilitated through encouraging formal and written agreements among players, integrating gender into cooperatives and regulating child labour.

Financing and incentivising ASM activities to encourage formalization

ASM experts have always been advocating that taxing the small-scale miners too much can act as a limitation to formalization in poorer mining societies (UNEP, 2012). Government should represent the ASM sector by developing micro-finance policies and encourage banks and other financial institutions to assist miners in accessing working capital with flexible terms of repayment. Hire-purchase loans for critical equipment such as jackhammers, compressors, generators, stamp mills and ball mills, concentrating tables within ASM, should also be facilitated by government. Apart from these activities, government should also inspire ASM miners to formalise through enhancing the advantages of operating legally by using incentives such as technical assistance and training.

Encouraging ASM and LSM partnerships

Avenues of collaboration between ASM and LSM include tribute mining. Tribute systems also works as funding methods for ASM activities. Examples of successful models include the Zimbabwe Zimasco Tribute System for chrome mining. LSM can help ASM miners in fulfilling corporate social responsibility. Assistance can also be in the form of training through knowledge sharing as well as the provision of second hand equipment.

Facilitation of laws relating to the free trade of minerals

A free trade environment for mineral produced by ASM miners guarantee that theft and unfair trade are minimised. This environment will enable miners to effectively honour their loan obligations as they will be able to secure the best returns from the market at prevailing rates for mineral prices. Government should therefore certify recognised mineral buyers in several districts as this will eradicate the need for miners to sell to only one buyer. Pact (2015) reported it was estimated between 35 and 50 percent of miners sell gold on the formal platform with the remainder selling to the informal market. The reasons stated include: higher prices offered by informal sector, high regulatory fees imposed by the formal sector, selling to FPR of Zimbabwe is inconvenient, with much risk associated with transporting gold.

Political willingness and its influence on formalization

ASM activities can present an easy way for government officials and politicians to amass large sums of money. This is because there are corrupt officials to apply legislation properly and exploit ASM miners for their own selfish gains. These officials are linked to syndicates that dominate gold buying and offer low price to ASM miners.

Cases in Africa where strong-armed policing strategies have resulted in unattractive consequences for ASM communities, hindering formalization, have been documented in the Democratic Republic of Congo (Greenen, 2013), Zambia (Fwaya emerald mining area), (Siwale & Siwale, 2017) and Zimbabwe (Spiegel, 2015). In the case of Zimbabwe, Spiegel reported that, in the 1990s and early 2000s, the government introduced internationally validated policies to formalize ASM. This was through a combination of rural district councils (RDCs) issuing licences to riverbed panners (Statutory Instrument 275 (1991, Regulations on Alluvial Gold Panning in Public Streams) to control the impact of panning as well as the involvement of government engineers with small-scale gold reef miners to support licencing strategies as capacity building measures. Despite challenges experienced in these initiatives, Spiegel (2015) stated that the programmes indicated the government of Zimbabwe was confident it could formalise ASM in the 1990s and the early 2000s. This also gave donors a sense of confidence in becoming involved in ASM.

However, Spiegel (2015) also noted the change in political decisions that led to ASM being seriously affected. This included forcing miners to sell their gold to the Reserve Bank of Zimbabwe at an unfavourably low price. Statutory Instrument 275 of 1991, that had previously allowed RDCs to issue licences, was revoked in 2006. Also in 2006, a nationwide embargo was initiated against gold panners, miners and traders (Spiegel, 2015). This involved police units and Reserve Bank staff travelling to mining sites and shutting down operations and demanding that operations could only be resumed if compliance with the EIAs were met; although these requirements were prohibitively expensive. Although these initiatives took place in the past, Zimbabwe is now accommodative of ASM and actions to promote formalization are now being seen. The government of Zimbabwe is now showing support for ASM through finance, while in 2017 possession of gold was officially legalised allowing ASMs to sell their gold to the FPR of Zimbabwe. Gold buying licences, which were previously expensive (Zvarivadza, 2018), were now issued free of charge.

Instead of rushing decisions and changing policies frequently, it is the task of government to properly channel ASM activities. This should be administered over specified periods of time, say 5 years, to allow for careful analysis of expected results of each activity undertaken so that results are adequately

measured and lessons learned and best practices are documented. Future ASM formalization interventions can thus be optimised through such initiatives.

Proposed formalization Roadmap

Assumed prerequisite activities to the realisation of a formalised ASM sector have been discussed in the previous sections. The emphasis of the roadmap is on the codification and modification of existing measures to ensure a comprehensive approach towards design and implementation of any ASM project. A summary of these activities is given in *Figure 2* as a proposed roadmap towards a formal ASM sector.

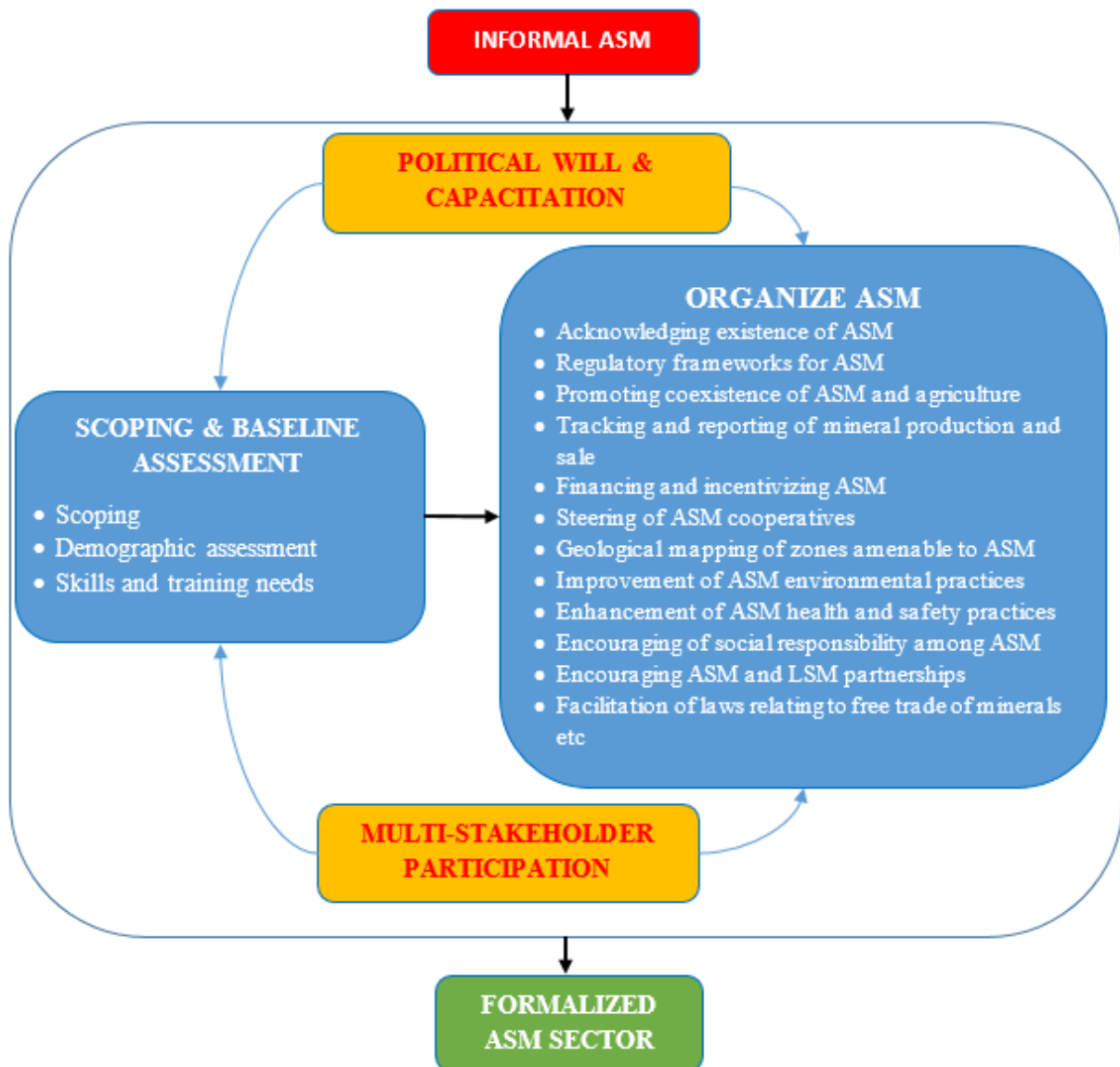


Figure 2 Proposed roadmap to enable formalization of ASM in Zimbabwe.

CONCLUSIONS AND REMARKS

The study has indicated that several ideas for formalizing ASM in Zimbabwe have previously been tried, but the assumed benefits from these initiatives have not yet been fully realised. These initiatives have been implemented mostly in isolation without considering, holistically, all the activities

summarised in the proposed roadmap. This then led to the collapse of some of these initiatives, such as the Shamva Mining Centre, due to inadequate analysis and integration of key issues necessary for sustainability and formalization. We therefore propose that for formalization to make an impact, an integrated approach based on understanding stakeholder needs, the demographics of the ASM sector, provision of appropriate training and a structured coordination of the sector, would increase the sustainability of formalization programmes. These programmes would have to be supported by a strong political will and robust, capacitated implementing institutions. Built on these arguments, a formalization roadmap was proposed to ensure the ASM sector rolls out its anticipated benefits to all stakeholders.

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