Artisanal and small-scale mining in Tanzania – Evidence to inform an 'action dialogue'

Willison Mutagwaba, John Bosco Tindyebwa, Veronica Makanta, Delphinus Kaballega and Graham Maeda

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MTL Consulting

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IIED's Shaping Sustainable Markets group works to make sure that local and global markets are fair and can help poor people and nature to thrive. Our research focuses on the mechanisms, structures and policies that lead to sustainable and inclusive economies. Our strength is in finding locally appropriate solutions to complex global and national problems.

Partner organisation

MTL Consulting Company Limited performed the role of Dialogue Researcher for IIED's national 'action dialogue' on artisanal and small-scale mining in Tanzania. Based in Dar es Salaam, MTL was formed in 1998 with the aim of providing consulting services to the natural resources sector, specifically the mining and oil and gas sectors.

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Abbreviations and acronyms

AMGC	African Minerals and Geosciences Centre
ASM	Artisanal and small-scale mining
ASGM	Artisanal and small-scale gold mining
CASM	Communities and Small-Scale Mining
CBOs	Community-based organisation
CSO	Civil society organisation
DC	District Commissioner
DED	District Executive Director
DFID	Department for International Development (UK)
ESRF	Economic and Social Research Foundation
EPP	Environmental protection plan
FDI	Foreign direct investment
FEMATA	Federation of Miners Association of Tanzania
FGD	Focus group discussion
GEREMA	Geita Regional Miners' Association
GGM	Geita Gold Mine
GST	Geological Survey of Tanzania
ICCM	International Council on Mining & Metals
IIED	International Institute for Environment and Development
ILO	International Labour Organization
KII	Key informant interview
LLG	Learning and Leadership Group
LSM	Large-scale mining
MAREMA	Manyara Regional Miners' Association
MEM	Ministry of Energy and Minerals
MM	Ministry of Minerals
MSPI	Multi-Stakeholder Partnership Initiative
MWI	Ministry of Water and Irrigation
NAWAPO	National Water Policy
NBC	National Bank of Commerce
NEEC	National Economic Empowerment Council
NEMC	National Environment Management Council
NEP	National Environmental Policy
NMB	National Microfinance Bank
NRGI	Natural Resource Governance Institute

OSHA	Occupational Safety and Health Authority
PML	Primary mining licence
PPE	Personal protection equipment
REMAs	Regional miners' associations
REPOA	Research on Poverty Alleviation
RMO	Resident mines office
SACCOS	Savings and Credit Cooperatives Society
SDC	Swiss Agency for Development and Cooperation
SIDO	Small industrial development organisation
SMMRP	Sustainable Management of Mineral Resources Project
SSI	Semi-structured interview
STAMICO	State Mining Corporation
TAMICO	Tanzania Mines, Energy, Construction and Allied Workers Union
TAMIDA	Tanzania Mineral Dealers' Association
TAWOMA	Tanzania Women Miners' Association
TASPA	Tanzania Salt Producers' Association
TIB	Tanzania Investment Bank
TMAA	Tanzania Minerals Auditing Agency
TRA	Tanzania Revenue Authority
TWCC	Tanzania Women's Chamber of Commerce
UDSM	University of Dar es Salaam
UNECA	United Nations Economic Commission for Africa
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNIDO	United Nations Industrial Development Organization
URT	United Republic of Tanzania
VETA	Vocation Education and Training Authority
VPO-DoE	Vice President's Office: Division of Environment
WIMA	Women in Mining Association
ZMO	Zonal mines office

Summary

Mining is increasingly important in Tanzania for the development of the country's economy. While mining of gold, gemstones (mainly tanzanite) and diamond dominate the sector Tanzania is endowed with a variety of other minerals. The mining sector involves both large-scale mining (LSM) and artisanal and small-scale mining (ASM) operations. The former is highly mechanised with the active participation of multinational enterprises, whilst ASM is undertaken by individuals or groups with limited equipment and often informally without mineral rights.

The Ministry of Minerals (formerly Ministry of Energy and Minerals) is the regulator of mining activities and has taken a number of steps to help formalise small-scale mining. Despite these positive interventions, there has been little change, and artisanal and small-scale miners face a number of challenges: constrained access to mining land; long delays to register primary mining licences (PML); inadequate extension services to improve skills and care for the environment; unavailability of progressive market arrangements; and a lack of opportunities for value-addition.

A national ASM dialogue programme, run by the International Institute for Environment and Development (IIED), provides an important platform for fostering participatory reform and policy. Its aim is to help national stakeholders to identify solutions that promote formalised, rights-based, productive ASM within a more inclusive and responsible mining sector. The NGO HakiMadini carried out the role of convener for the ASM dialogue process in Tanzania, and MTL Consulting conducted pre-dialogue research.

The researchers documented evidence on ASM in Tanzania using both primary research and a review of secondary data to provide a background knowledge document for the national dialogue. ASM stakeholders consulted included holders of primary mining licences, mining communities, ASM associations including women's groups, service providers, civil society organisations, government agencies at regional, district and village levels involved with mining and related sectors, the media and academia. The research adopted a multi-method approach for effective data collection. This included a desktop study, stakeholder mapping, and stakeholder engagement using semi-structured interviews, key informant interviews, focus group discussions and site visits in selected locations.

The research provides insights into the potential and positive impact of ASM, as well as highlighting the existing challenges facing the sector. ASM has been a source of livelihood for a significant number of people in Tanzania for decades. The positive impacts linked to ASM activities in the country include contribution to employment, development

of the area where ASM is conducted, revenue collection at the village and national levels, and marketing of the region where ASM activities are being mined for potential future investment. These collectively enhance the livelihoods of the ASM operators and their associated local settings and consequently the national economy.

ASM challenges highlighted in the research include: lack of mandate and influence of local governments; lack of guiding prices for minerals; high cost of acquiring a licence; limited areas for establishing ASM activities; lack of geological information; poor technological tools; insufficient mining experts for extension services; lack of finance and credit; lack of awareness and enforcement of mining regulations; exclusion and lack of ground-level voices in decision making processes; licensed miners using informal operators; weak institutions and lack of coordination between government agencies.

The stakeholders consulted proposed a number of solutions to overcome ASM challenges including: considering surface rights before granting licences; increased involvement of village governments; provision of training to enable ASM to access and manage government grants; development of land use plans in all areas with mining activities; increased land allocation for ASM; provision of training in financial management; data sharing among agencies; establishment of a centre where all mining-related information can be obtained; encouraging women ASM operators to work in groups; and clear identification and publicising of the role of each stakeholder in the formalisation process.

The Tanzanian national dialogue, in which relevant stakeholders debated and crystallised thematic solutions, has now resulted in a draft roadmap for ASM reform in Tanzania. A group of national ASM representatives, known as the Learning and Leadership Group (LLG), has been formed to lead the refinement and implementation of the roadmap.

Mine shaft, Geita, Tanzania (IIED/Steve Aanu)

1 Introduction

This research report was prepared for the 'action dialogue' on ASM in Tanzania, held in Geita from 7 to 10 November 2017, in order to provide participants with a common understanding of the sector. IIED runs a global ASM dialogue programme designed to help national stakeholders to identify solutions to promote a responsible, inclusive and productive ASM sector that can contribute to sustainable development. It provides a much-needed forum for multi-stakeholder collaboration and knowledge sharing to promote better governance, greater voice, and secure and productive employment across the mining sector and in complementary rural livelihoods—such as agriculture. The programme strives to make sure that all stakeholders participate, that the process is locally owned, and that discussions focus on solutions. This way, the IIED dialogues can help align ASM with national priorities and sustainable development agendas. IIED's dialogue approach has already been used in Ghana and Madagascar.

In preparation for the dialogue process in Tanzania, IIED contracted HakiMadini as dialogue convener and MTL Consulting as pre-dialogue researcher. The primary function of the pre-dialogue research (the research presented in this paper) was to draw together local knowledge and existing research to produce a country diagnostic. This research was preceded by an ASM multi-stakeholder scoping exercise conducted by IIED in September 2016, which identified key themes. The collective findings from the research and engagements represented a valuable body of information that was used as a basis for thematic dialogues conducted by IIED in collaboration with local partners in preparation for the national dialogue. A discussion paper (see Weldegiorgis and Buxton, 2017), which incorporated key outputs from the various stakeholder engagements, the research presented in this paper, and thematic dialogues, was produced as a white paper to inform the national ASM dialogue.

1.1 Purpose of this report

The information presented in this report is the result of research and engagement work on ASM in Tanzania. The purpose was to provide evidence to inform the national ASM dialogue for ASM sector reform. The specific objectives of the research were to:

- Collect evidence and synthesise what is known about the ASM sector in Tanzania;
- Undertake stakeholder mapping and engagement and identify critical knowledge gaps;
- Refine the research findings to produce a background knowledge document that supports forward-looking dialogue.

1.2 Methodology

The research adopted a multi-method approach that involved a desktop study of existing secondary information, a multi-stakeholder mapping process, and the collection of primary data in the field through a consultative process with a range of national and district officials, members of civil society, the private sector and ASM communities.

1.2.1 Desktop study

This activity focused on a contextual understanding of the ASM sector through the detailed collection, review and compilation of existing information on ASM obtained from diverse sources. The desktop study also identified ongoing research, projects, training and other relevant activities carried out by institutions and individuals towards the formalisation of ASM, to determine the status of existing initiatives. The sources consulted included the following:

- Ministry of Energy and Minerals (MEM) – renamed the Ministry of Minerals (MM)[1] in 2017 – for information about ASM statistics in Tanzania, contribution of the mining sector to national GDP, ASM production trends in Tanzania and the various initiatives undertaken to develop ASM in Tanzania;
- Financial institutions, eg, Tanzania Investment Bank (TIB) and micro-financing institutions, where information related to ASM credits and grants were collected;
- Geological Survey of Tanzania (GST);
- Zonal Mines Offices in the study area;
- Regional and District government records;
- National Environment Management Council (NEMC);
- Specific research conducted by various institutions on ASM and related areas, including the University of Dar es Salaam (UDSM), Geology and Economics Departments, Economic and Social Research Foundation (ESRF), Research on Poverty Alleviation (REPOA), and others;
- Regional miners' associations (REMAs) in selected project areas;
- The Federation of Miners Associations Tanzania (FEMATA);
- Previous activities focusing on the ASM sector, including studies by NGOs such as HakiMadini, Tanzania Women Miners' Association (TAWOMA) and UN Women;
- Relevant groups of women and youth that are not necessarily represented by formal associations;
- National documents and legal documentation including policies and principal and subsidiary legislation.

1.2.2 Multi-stakeholder mapping

The identification of stakeholder groups considered the following factors:

- Dependency – institutions, groups or individuals who depend on the ASM sector, and upon whom the sector in turn depends in order to function;
- Responsibility – institutions, groups or individuals whose involvement in ASM carries commercial, operational or ethical/moral responsibilities;
- Tension – institutions, groups or individuals whose actions directly or indirectly result in tensions with respect to ASM's social or environmental issues;
- Influence – institutions, groups and individuals who may have an impact on ASM with regards to strategic planning or operational decision making;

[1] MEM and MM are used as appropriate throughout the document.

- Diverse perspectives – institutions, groups and individuals whose different views can lead to a new understanding of the situation and the identification of opportunities for action that may not otherwise occur.

The following identification methods were used to develop a stakeholders' database:

- Site visits and interaction with communities around mining areas;
- Compilation of a list of key local authorities, ministries and agencies relevant to ASM;
- Information received through telephone and online communications;
- Snowball sampling techniques using information received from other stakeholders;
- Personal experiences and consultations with other researchers.

The information collected on stakeholders was then qualitatively analysed to enable grouping of stakeholders according to their influence and support in relation to ASM. A further consideration was mineral representation, with the list of stakeholders grouped according to their relation to gold, gemstones and diamonds, industrial minerals and building materials.

1.2.3 Primary research and multi-stakeholder engagement

Primary research and stakeholder consultations were carried out through a field study process on the mineral types and locations described in Table 1 below. The location of these field study areas is shown in Figure 1 on a geological map of Tanzania.

Table 1. Primary study minerals and areas

No	Mineral type	Mining sites	Region
1	Gold	Nyarugusu; Rwamgasa	Geita
2	Gemstones	Kalalani	Tanga
3	Diamonds	Maganzo	Shinyanga
4	Limestone and aggregates	Amboni	Tanga
5	Salt	Maere	Tanga
6	Gypsum	Makanya	Kilimanjaro

Questionnaires were prepared for specific groups of ASM stakeholders to aid the collection of both qualitative and quantitative data. Semi-structured interviews (SSIs) were conducted with PML owners, miners, pit owners, service providers in mining centres and business people within the mining areas. Data on ASM operations, marketing, financing, environmental and socio-economic issues, health, education, agriculture, and general community welfare were collected. A total of 49 SSIs were conducted, including 17 with primary mining licence (PML) owners, 18 with miners, two with service providers, six with business people in the mining areas, five with miners' associations and one with a pit owner. Questionnaires were translated into Swahili. Having determined the groups of stakeholders, the numbers of interviewees were dependent on many factors including readiness to be interviewed, availability at the time of the study and knowledge and awareness of issues within their working environment.

Key informant interviews (KIIs) were conducted with stakeholders within the government, the private sector, civil society organisations (CSOs), financial institutions and educational institutions in order to explore their experience and opinions on the ASM sector. Interview guides tailored to each key informant category were produced. A total of 24 KIIs were conducted (see Appendix A). Focus group discussions (FGDs) were held with miners, women and youth groups, leaders of associations and CSOs, local government officials and specific community groups. FGDs were conducted to encourage different categories of stakeholder to discuss challenges and solutions based on their respective experiences in the ASM sector. In total, 15 FGDs were conducted (see Appendix B).

Site visits were conducted in the sites mentioned in Table 1 in order to understand the respective ASM operations, physical features, principal land uses, production and marketing arrangements, environmental, health and safety concerns, and issues associated with surrounding communities. The visits also enabled collection of socio-economic information on livelihood activities, assessment of social relations between miners, traders and surrounding communities, and assessment of supporting social infrastructure

Figure 1. Field study locations

Source: study locations inserted by MTL Consulting on a National Geographic Map

1.3 Definitions of artisanal and small-scale mining

Artisanal and small-scale mining occurs in approximately 80 countries across the globe (World Bank, 2013). ASM has expanded rapidly in many developing nations driven by increasing population pressure and limited alternative income sources in rural areas (Lahiri-Dutt, 2004). Although it has taken some time, international development institutions now widely agree that ASM is largely a poverty-driven activity (Aryee *et al*., 2003; Hilson & Banchirigah, 2009; Hilson & Garforth, 2013). Equally, it has been widely agreed that there is no universal definition of what constitutes ASM. Table 2 below summarises the various definitions of ASM according to different international institutions focusing on ASM.

Table 2. Definitions of artisanal and small-scale mining

ASM Definition	Organisation
Definitions are disputed, but broadly speaking ASM operations exploit marginal or small deposits, lack capital, are labour intensive, have poor access to markets and support services, low standards of health and safety and have a significant impact on the environment. (Buxton, 2013)	International Institute for Environment and Development (IIED)
Largely a poverty driven activity, typically practiced in the poorest and most remote rural areas of a country by a largely itinerant, poorly educated populace with few other employment alternatives. (World Bank, 2013)	The World Bank
There is no formal definition for ASM, but it is broadly understood to refer to mining activities that are labour-intensive and capital-, mechanisation- and technology-poor. (ICMM, 2010)	International Council on Mining & Metals (ICMM)
Despite differences in definition, common attributes stand out: most miners are seriously under-capitalised; rarely operate as proper business enterprises and lack appropriate and modern technology. (UNECA, 2011)	United Nations Economic Commission for Africa (UNECA)
… [ASM] commonly represents a spectrum of activities ranging in scale from small to large that is generally distinguished from 'formal' mining by a relatively low degree of mechanisation, high degree of labour intensity, poor occupational and environmental health standards, little capital investment and lack of long-term planning. ASM is typically an informal and highly disorganised activity. (Hinton, 2005)	Communities and Small-Scale Mining (CASM) and UK Department for International Development (DFID).

ASM Definition	Organisation
The majority of workers in ASM exploit small deposits in remote rural areas, from where it is difficult for miners to get their goods to the market. Their work is labour intensive, low paying, extremely hazardous, and almost always avoided if other work is available. (ILO, 2003)	International Labour Organization (ILO)
A definition is fundamental in distinguishing Artisanal and Small-Scale Gold Mining (ASGM) from other mining activities. While challenging, legally recognising the many different types of ASGM that exist is an important tool in deciding how to address the activity, and for adapting regulations to appropriate levels of control for different types of activity. Ultimately, the appropriate definition is best decided at the national level. (UNEP, 2012).	United Nations Environment Programme (UNEP)
… at [the] global level ASM still means different things to different people … Nevertheless, ASM operations all over the world share common characteristics…ASM is usually a spontaneous self-organising social system, while industrial mining is planned and centrally coordinated. Artisanal miners engage in mining to earn a living, while industrial mining (large, medium and small-scale) is driven by profit expectations … (SDC, 2011)	Swiss Agency for Development and Cooperation (SDC)

Source: Hilson *et al.* 2014

The definition of ASM in the Tanzanian context is not conclusive. Mining legislation in Tanzania does not give a direct definition of 'artisanal', 'small-scale mining' or 'artisanal and small-scale mining'. Section 4 of the Mining Act, 2010 defines a primary mining licence as a licence for 'small-scale mining' operations, whose capital investment is less than USD 100,000 or its equivalent in Tanzanian shillings. Therefore, by law, small-scale miners are those operating with a PML and with capital of less than USD 100,000. In this report, ASM is used to denote miners that employ traditional mining techniques and mostly have communal and production-sharing mining arrangements, with production of less than 10 tons per day. Small-scale mining (SSM) is used where appropriate to denote operations as defined in the Tanzanian legislation.

Whilst the term ASM is commonly used to describe mining by individuals, groups, families or cooperatives with minimal or no mechanisation, often informally and/or illegally, in the Tanzanian context the term is used to refer to both formal and informal operations. A distinction is usually recognised with SSM referring to *formal* mining operations, usually with mineral rights; and artisanal mining referring to *informal* operations carried out without mineral rights. In this paper, and to a large extent in the Tanzania context, illegal operations refer to activities carried out by a group of people who knowingly

or unknowingly invade and extract minerals from an area already licensed to another operator (both exploration and mining leases).

1.4 Structure of the report

This document presents the findings of the dialogue research and is structured as follows: Section one introduces the research objectives, methodology and outline. Section two puts the ASM activities in Tanzania into context. In addition to describing the overall characteristics of the sector (including its geographical spread, numbers of participants and the technology employed) specific details are given on the production of Tanzania's various mineral commodities. Section three presents findings of research from secondary sources. It outlines the regulatory setting that governs ASM operations in Tanzania (including the policy and legislative requirements) and then highlights the key issues that are known to impact sustainable ASM in Tanzania. Section four maps the Tanzanian ASM stakeholders in order to understand the knowledge and perspectives of the key players. Section five identifies the initiatives that have already been undertaken by the government, private sector and civil society in Tanzania to support development of the ASM sector. Section six then presents the key findings from the field study and stakeholder engagement conducted during 2017, with the findings structured by thematic areas in line with the outcomes of the ASM multi-stakeholder scoping exercise. Section seven sets out the recommendations from the stakeholder engagement that might serve as a basis for a solutions-focused Tanzanian dialogue. Finally, section eight presents conclusions.

Mining red garnet (IIED/ Magali Rochat)

2 ASM in context in Tanzania

This section of the paper puts the ASM activities in Tanzania into context. In addition to describing the overall characteristics of the sector – including its geographical spread, numbers of participants and the technology employed – specific details are given on the production of Tanzania's various mineral commodities.

2.1 Introduction to ASM in Tanzania

The exploitation of Tanzania's mineral resources is undertaken by two large sectors: the large-scale mining sector, which is associated with foreign direct investment (FDI), and characterised by infrastructure development, advanced technology, high productivity and high export earnings; and ASM, which, in most cases, is characterised by limited investment and hence utilisation of poor technology, and results in low productivity and lack of re-investment.

ASM in Tanzania often involves local miners using basic methods to extract near-surface deposits in an informal, low investment and labour-intensive operation, alongside the use of informal marketing channels. About two-thirds of Tanzanian ASM involves gold extraction; other minerals mainly include gemstones (including diamonds), industrial minerals and metallic ores such as copper.

ASM tends to be carried out by people who have no basic formal mining training and no access to formal credit facilities like commercial banks loans. The sector still has considerable potential to reduce poverty, and according to national statistics, ASM communities fare better in terms of poverty levels than other communities. In addition to being a source of wealth creation, asset accumulation and investment, ASM has the potential to increase people's livelihood security and reduce their vulnerability.

2.2 Characteristics of Tanzanian mineral production

Tanzania is endowed with a variety of minerals and building materials including: metallic minerals such as gold, iron, silver, copper, platinum, nickel and tin; and gemstones such as diamond, tanzanite, ruby, garnet, emerald, alexandrite and sapphire. The industrial minerals include kaolin, phosphate, lime, gypsum, diatomite, bentonite, vermiculite, salt and beach sand; as well as building materials such as stone aggregates and sand, and energy minerals such as coal and uranium (URT, 1997). Figure 2 depicts these commodities on a geological and mineral occurrence map of Tanzania. The minerals occur in the following areas:

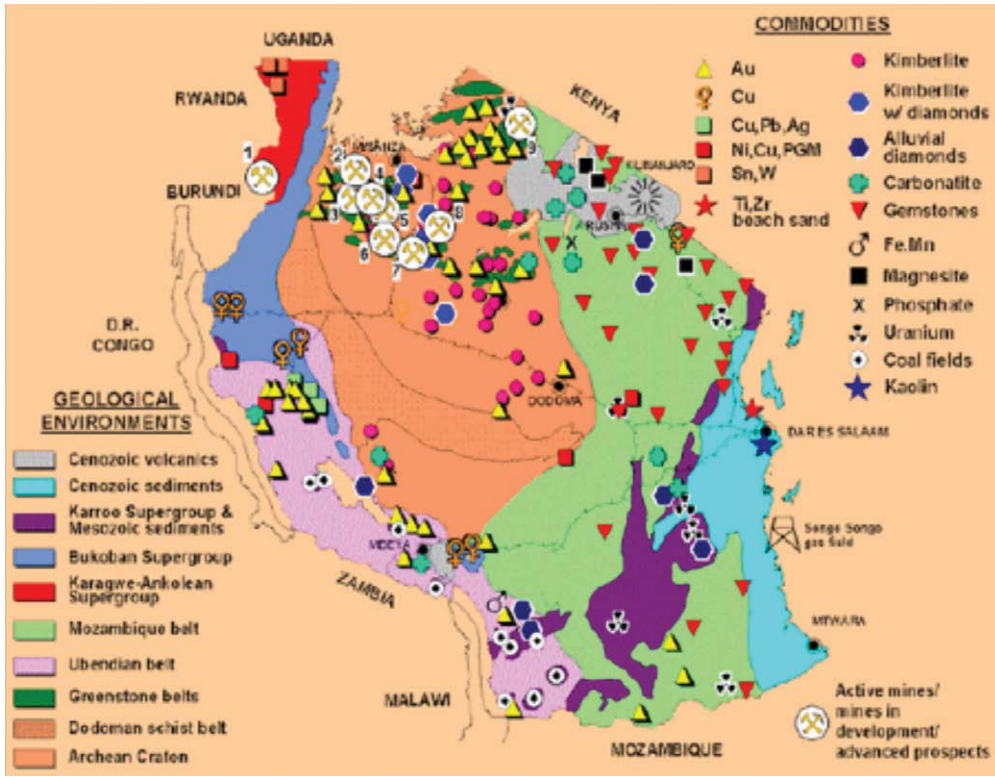
a) Gold in the greenstone belt south, east and west of Lake Victoria;

b) Diamonds in kimberlite pipes in central and south Tanzania and the southern part of Lake Victoria Goldfield;

c) Nickel, cobalt, copper, tin and tungsten minerals in north–western Tanzania;

d) Titanium, vanadium and iron in south-western Tanzania;

Figure 2. Geological map and mineral occurrences in Tanzania



Source: Mineral Policy of Tanzania, URT, 2009, p.28

e) Coal in south-western Tanzania;

f) Uranium in central and southern Tanzania;

g) Soda ash, salt, gypsum, travertine and trona (evaporites) in the rift valley and along the coast;

h) Kaolin, mica, phosphate, magnesite, beach sand, diatomite, stone aggregates, dimension stone and sand in different parts of Tanzania.

From 1987 to 1997 ASM accounted for almost the entire country's production of gold, copper and silver. This trend was then reversed in the late 1990s following the massive inflows of FDI into large-scale mining. The enactment of a new Mining Policy in 1997, and a new Mining Act in 1998, saw the mining industry gradually become dominated by large-scale mining (LSM). Between 1997 and 2005, five large-scale gold mines were opened

in the country.[2] The introduction of a new small-scale mining licensing system in the 1998 Mining Act also saw the start of formalisation of artisanal mining. The simplification of the licensing system, coupled with institutional support under the World Bank-financed mineral support programme that started in 1995, led to an expansion of the ASM sub-sector.

Artisanal and small-scale mining has therefore been a source of livelihood for a significant number of people in Tanzania for decades. The average official contribution of the mining sector in Tanzania's economic growth gradually increased from 0.2 per cent in 1995–1999 to 3.4 per cent in 2007– 2008 (URT, 2008). The recent data from the MEM 2017/2018 financial budgetary presentation on June 2017 shows that the figure had increased to 4 per cent in 2015. ASM has a broad range of positive benefits including:

- Providing employment where economic alternatives are critically limited (Hinton 2005);
- Providing an alternative to agriculture in the face of structural adjustment programmes, at the same time as reinvigorating deteriorating smallholder farming activities (Hilson & Garforth 2013);
- Catalysing the growth of infrastructure;
- Reducing rural–urban migration (Hinton 2005);
- Creating downstream employment. It is estimated that six downstream jobs are created per individual directly employed in ASM (Hilson *et al*, 2014);
- Accommodating a range of occupations such as service people (taxi drivers, cooks, clothing merchants), semi-skilled labourers (machine operators, repairmen), and skilled occupations (bookkeepers, accountants, technicians);
- Enabling the exploitation of mineral deposits that are not attractive to formal mining companies (Hinton 2005);
- Contributing to economic growth.

[2] The Bank of Tanzania Annual Report 2015/16 shows that average annual gold exports from Tanzania between 2011 and 2015 are about 41.85 tons (Bank of Tanzania, 2017). Similarly, the budget speech for 2017/18 by the Minister of Energy and Minerals to Parliament showed that LSM gold production and export for 2016 was 44.162 tons.

Figures obtained through consultations with the Ministry of Energy and Minerals (MEM) show that the officially declared annual average gold production by ASM is around 1.1 tons. A report published by UNEP in 2012 however estimated ASM gold production to be around 4 tons, accounting for approximately 10 per cent of Tanzania gold production (UNEP, 2012). A study carried out in Geita by MTL Consulting in 2013 estimated the average ASM gold production in the region to be around 275,000 grams per month, or 3.3 tons per annum. The 2011/12 Census carried out by MEM showed that nearly 24 per cent of all ASM gold miners operate within the Geita Region (MEM, 2012). If the population ratio is directly linked to production figures, it can be estimated that ASM annual gold production is around 13.75 tons. As noted above however, only 1.1 tons of this is officially declared and hence accounted for in the official gold exports.

Most of the mineral extraction methods used in ASM involve techniques that are manual and labour intensive, using rudimentary technology (eg picks, shovels, chisels and other improvised tools). Even where mechanisation has been introduced, the lack of mining knowledge leads to inefficiencies in the selection and operation of the machinery used. It is generally accepted that ASM exploits those mineral deposits that are geologically suited to the most basic forms of extraction – deposits that would be regarded as marginal for most medium and large-scale mining operations. Most ASM activities are also carried out without regard to health, safety and environmental regulatory requirements, or widely accepted good practices and standards.

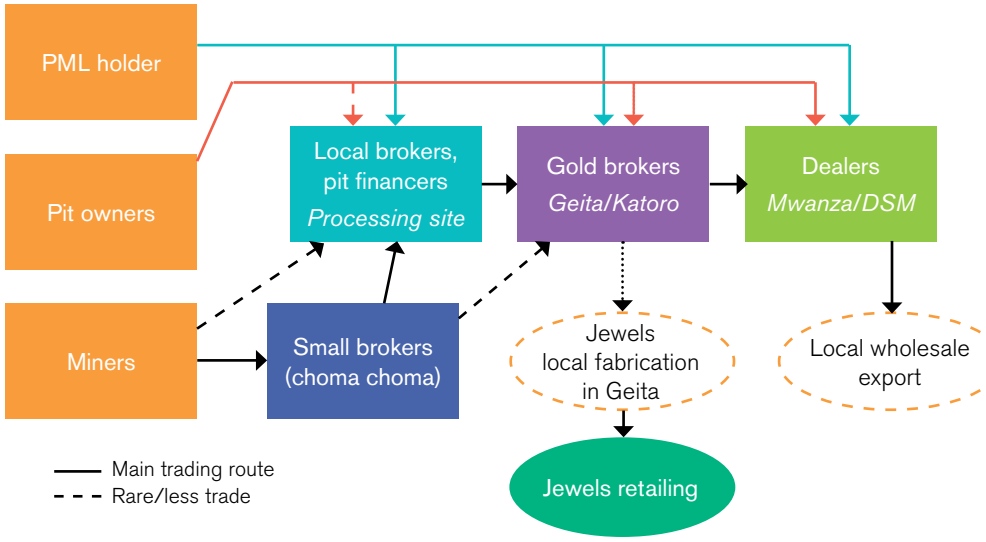
In Tanzania ASM has always run in parallel to large-scale mining operations. In recent years illegal ASM activities in Geita Region have increased substantially, attracting large numbers of people and becoming a material threat to the large-scale Geita Gold Mine (GGM) operations. Illegal incursions by ASM onto GGM premises include the theft of waste rocks and ores, accompanied by an increase in security clashes leading to injuries and fatalities of illegal miners. Other ASM gold mining areas are found in Tarime, Musoma, Sekenke, Chunya, Tanga, Morogoro, and Arusha.

2.2.1 Gold

Mining activities usually flourish in the initial periods with the recovery of easily accessible sub-surface deposits. As gold reefs/veins get deeper, water becomes a problem requiring heavy pumps to drain mine workings to allow mining to continue. As mining becomes difficult, expensive and slow, significant capital is needed to purchase powerful generators and submersible water pumps, which is beyond the reach of the majority of ASM operators (World Bank, 2015).

The two gold mining study areas selected for this research, Rwamgasa and Nyarugusu, are located in Geita Region with a similar operational set up to that described in Figure 3 below. Rwamgasa processes more ore than it produces with the majority being bought from surrounding sites. In both Rwamgasa and Nyarugusu there are many on-site brokers who buy small collections of gold that they sell to the big brokers in Geita and Mwanza. The Katoro area, which is located on the highway that links Mwanza to the neighbouring countries of Uganda, Rwanda, Burundi and DRC, has become a major gold trading centre, attracting miners from the study areas of Nyarugusu, Rwamgasa, and beyond. Figure 3 shows a typical gold ASM conceptual model of operation in Tanzania.

Figure 3. Typical gold ASM conceptual model of operation in Tanzania



Source SMMRP, 2017

Box 1. Key players in the ASM gold supply chain

In 2013, AngloGold Ashanti, owners of the Geita Gold Mine, commissioned MTL Consulting to carry out an assessment of the politics of the ASM gold supply chain in Geita Region as part of an effort to develop a strategy for formalisation of ASM activities in the area. The following were documented as key actors in mining and trading operations.

- **Primary mining licence (PML) owners**: These are registered mineral rights' owners and are legally responsible for mining activities conducted within their areas, including hiring and paying for labour, organising the mining, and adhering to safety and environmental regulations.
- **Pit holders**: It is a widespread practice among PML owners to informally lease out mining activities to pit holders, who organise procurement and sourcing of necessary inputs and labour and conduct the mining. Capital investments and the risks and costs related to fruitless periods fall upon pit holders as the primary financial risk-takers.
- **Pit financiers**: This group involves business people mainly based in Geita, dealers and some big brokers. At the start of mining operations, most founders of a pit (or shareholders) look for a financier and enter into an agreement. If a financier owns processing equipment, such as grinding mills, sluice boxes, panning bays, miners from the financed pits must process their material at their processing centres, and in return they must surrender the resulting processing tailings.
- **Buyers of ore**: This group involves people who buy unprocessed ore from the miners who either cannot afford the cost of processing or need money quickly to meet their other needs. Sales of ore that are carried out at the pit mouth are mainly to the shareholders, pit owners and sometimes the financier.
- **Onsite gold brokers**: This group mainly includes illegal brokers that operate from mine sites either individually or as agents of the (licensed) big brokers in Geita or agents of dealers based in Mwanza.
- **Big brokers and jewellers**: The majority of the big brokers are licensed, and operate from Geita, and some operate from Buseresere and Rwamgasa. They are linked to mining sites through networks of brokers who buy on their behalf at the mining sites. This group has a large financial base and hence finances a network of illegal brokers located in mining sites to buy gold.
- **Processing centres**: In addition to some mining areas which have their own dedicated processing centres, there are also processing centres that receive and process ore from other mining areas. The ore in these sites includes ASM-produced ore and ore stolen from LSM (Geita Gold Mine in this case).
- **Cyanidation plants**: Apart from the direct mining and processing centres, ASM activities are, to a large extent, influenced by the cyanide vat leaching plants that are established around mining centres. The tailings for leaching are collected from ASM processing centres and transported to site.

2.2.2 Gemstones

Gemstone mining in Tanzania has traditionally been undertaken through ASM. Some of the prominent gemstone mining areas include Mirerani (tanzanite) and Mayoka (emeralds) in Manyara Region; Longido (ruby) in Arusha Region; Mahenge and Matombo (ruby) in Morogoro Region; Mpanda (emeralds) in Rukwa Region; Tunduru (alexandrite and its variants) and Mbinga (sapphire and its variants) in the Ruvuma Region. Others include Mpwapwa (sapphire and its varieties) in Dodoma Region, and alluvial diamonds in Shinyanga Region. Other mining centres are located in riverine environments, where alluvial gemstones have been transported from their parent rocks by geographical and geological events over millions of years and deposited in valleys or other suitable environments. Mining in these places is simpler with hand tools, though potentially unsafe. It is in these places that many unlicensed mobile ASM miners operate (World Bank, 2015).

Mining of gemstones in Mirerani, Longido and other places where rocks are hard, takes place by drilling and blasting the hard rock, trimming and hoisting the broken material to the surface and sorting for the precious gem. This is undertaken after mine development work has been done, such as establishing access shafts and drifts within the host rock, to access the mineralised rock. The tanzanite ASM sector is more organised than the gold ASM sector, but production and revenues are more volatile. All tanzanite mining is carried out in licensed blocks where owners of the PML engage miners on a production sharing agreement. The variation in production from one mine to another is influenced by the fact that the gemstones are found in pockets that, for ASM miners without proper geological data, often prove difficult to identify. Similarly, prices for tanzanite vary as these are dictated by the uniqueness of the particular stone or gem. Mining can often go on for several months without any serious production and pit financers can often go bankrupt.

2.2.3 Industrial minerals and building materials

Mining of industrial minerals through ASM in Tanzania dates back to the late 1960s. The minerals that are mined include limestone, bentonite, meerschaum, mica, salt, building stones, aggregates, gypsum, kaolin and dolomite. Currently miners tend to be more interested in mining minerals that are readily marketable, like salt, limestone for producing lime, clays for brick making, aggregates, gypsum, kaolin and to a lesser extent dolomite. Minerals like mica have lost market share as they have been replaced by other materials that have become available due to technological advancement, such as acrylate polymers, cellulose acetate, fiberglass, fishpaper, nylon, phenolics, polycarbonate, polyester, styrene, vinyl-PVC, and vulcanised fibre.

The mining, quarrying and processing of industrial minerals and building materials varies depending on the types of mineral. For instance, small-scale miners of gypsum need only basic tools such as picks and shovels to recover the gypsum in its raw form

and sell it without further processing. Those who are engaged in production of stone aggregates require sophisticated equipment such as drill rigs, crushers and screens, and need blasting expertise. The bulk nature of the material also requires the use of large transportation equipment. Industrial minerals and building materials are not as valuable as gold or gemstones on the weight-to-weight or volume-to-volume basis, and thus tend not to be very attractive to ASM.

2.3 Tanzanian ASM in numbers

In Tanzania there is no central point where data, information and research on ASM are archived, making it difficult to document ASM numbers over time. Under the current administrative set up this responsibility sits within the State Mining Corporation (STAMICO) and the small-scale mining unit in the Commissioner's office. The most comprehensive survey was conducted by MEM under the Sustainable Management of Mineral Resources Project (SMMRP) in 2012. Most of this information is now out-dated but some additional sources are available.

The current licensing system was established following the enactment of the 1998 Mining Act. According to data obtained from the licensing unit in the Commissioner's office, the number of PMLs has risen from just 35 licences issued in 1999 to a total of 5,171 PMLs issued in 2016. The increase took place in two different phases: between 1998 and 2009 under the 1998 Mining Act, and since the 2010 Mining Act. In 2009 during the first phase 3,906 licences were issued, (see Figure 4) due to increased efficiency in processing and issuing PMLs, designation of exclusive areas for PMLs, and awareness raising conducted by the MEM on the importance of having a PML. The changes made in the Mining Act in 2010 led to decentralisation of PML issuance from the Commissioner to Zonal Mines Officers. More areas were also designated for ASM. By 2017 a total of 36 areas had been designated for mining by ASM with a total area of 2,438 km^2, and a total of 8,800 PMLs were issued in these designated areas alone.

According to a baseline survey conducted by MEM, the number of artisanal and small-scale miners has shown a continuous increase from 150,000 in 1987, to 550,000 in 1996, and 680,385 by 2011, 27.6 per cent of whom were women (MEM, 2012). While these numbers are based on actual baseline surveys carried out across the country, there have also been estimates by different sources, some of which compare well. For example, in 1999 the International Labour Organization (ILO) estimated the employment in ASM in Tanzania to range between 450,000 and 600,000 (ILO, 1999). More recent estimates show an increasing number of participants. For example, in his speech to the Tanzanian Parliament in 2015, the Minister for Energy and Minerals estimated direct employment in ASM activities in Tanzania to be more than one million (MEM, 2014/2015 Budget Speech). Another more recent study commissioned by IIED on the interaction of ASM and agriculture estimated the number of active ASM participants in Tanzania to be around

1.5 million with 9 million people depending on the sub-sector for their livelihoods (Hilson, 2016). Figure 5 summarises the ASM population by mineral commodity.

Figure 4. The trend in PMLs issued 1999-2016

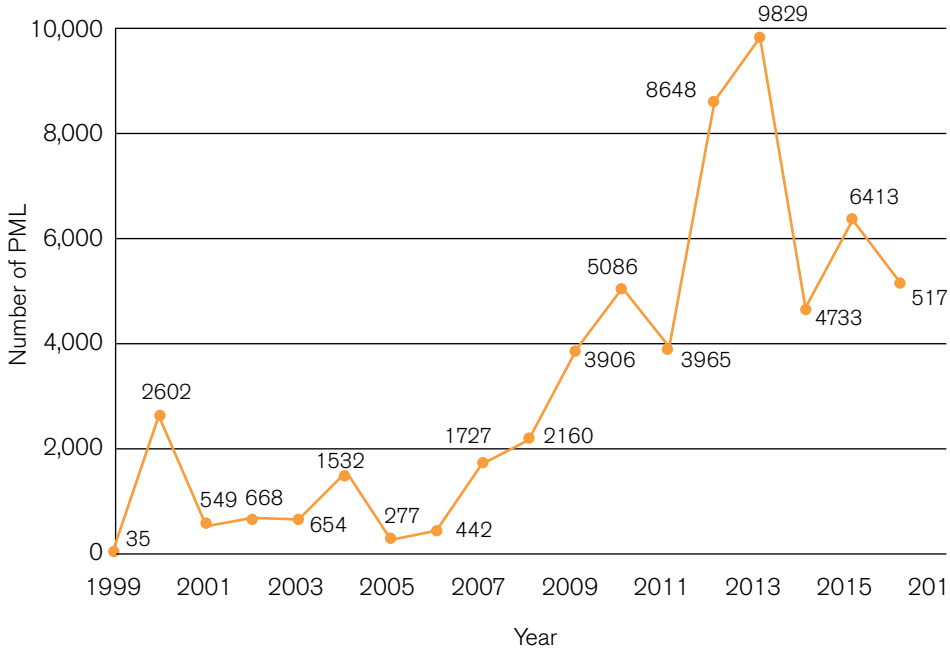
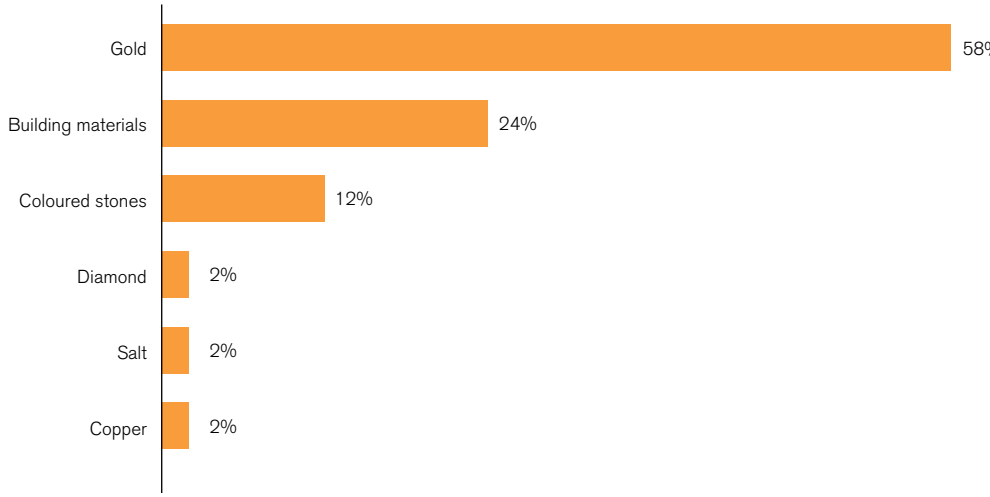


Figure 5. ASM engagement in different mineral commodities, 2011 (%)



Source: Report of Tanzania Baseline Survey on Artisanal and Small-Scale Mining, MEM. 2012

The growth of ASM operations in Tanzania is influenced by geological settings of the mineralisation, socio-economic structures and traditions. Generally, the following factors have contributed to the existence and growth of ASM:

- The favourable geological environment in the country with numerous sites of high grade, near-surface mineralisation, easily workable by ASM operators;
- The discovery of new gold deposits in the Lake Victoria area in the mid-1970s attracted more indigenous people into mining. The government lacked resources to cope with this sudden increase of mining sites;
- The economic policy reforms of the 1980s and 1990s, particularly those of mineral trade liberalisation (eg, the 1996 Tanzania Investment Policy identified mining as one of the priority economic sectors for development, which led to enactment of the Mining Policy, 1997 and the Mining Act, 1998, which supported the development of ASM as an economic sector), as discussed in the following section.

Women crushing rocks, Tanzania (IIED/Magali Rochat)

3 Tanzania's governance framework for ASM: current policy and practice

This section is based on research into secondary sources. It outlines the regulatory setting that governs ASM operations in Tanzania – including policy and legislative requirements – and then highlights the key issues that are known to impact sustainable ASM in Tanzania, based on a literature review of existing practice.

3.1 Steps towards the formalisation of ASM

While there is no universal definition for ASM formalisation, it generally refers to 'a process that seeks to integrate ASM into the formal economy through the development or adaptation of mining (and other) laws or policies' (UNEP, 2012:2). Formalisation of ASM involves clarification and enforcement of property rights, land-use planning, fiscal regulation, and, more broadly, the implementation of environmental and social norms. For governments, formalisation provides a platform to better govern and consequently manage the social and environmental impacts of mining (minimising its negative impacts and harnessing its positive impacts). The concept of formalisation of ASM has become popular in many countries due to the exponential growth of the number of people directly involved and the number of livelihood dependencies, as well as the need to address some of the growing concerns about the negative impacts of ASM operations.

The MEM which is the regulator of mining activities in Tanzania has taken a number of steps towards promoting and formalising ASM operations in line with the Mining Policy of 2009. These steps include designating exclusive areas for ASM, decentralising of ASM licensing, provision of government grants, and providing training programmes. A number of outstanding issues remain to be dealt with, however, including health, safety and the environmental impact of ASM, the role of women, and ASM's interface with other land uses.

3.2 Policies and legislation governing ASM in Tanzania

The policy, legal and institutional framework governing ASM operations in Tanzania has been changing since independence in line with the changing economic policies governing the country. The current ASM framework to a large extent reflects the Mining Policy of 1997 and the Mining Act of 1998, which were both part of the overall economic restructuring undertaken by the government in the second half of the 1980s. Their enactment saw a change in the government's role in the mining sector, from being that of an operator and owner to that of a regulator and facilitator.

In the early 2000s, national poverty reduction papers largely overlooked artisanal mining, but by 2005 they began to emphasise that 'the livelihoods of artisanal miners need to be balanced with commercial mining'. Government policy papers recognised that detailed knowledge of the dynamics in mining communities is vital to regulate extraction activities effectively (UNEP, 2012). The Tanzania Mineral Policy 2009 notes that although the government has since 1997 made efforts to formalise artisanal miners into small-scale miners and provide extension services, their contribution to the economy has remained insignificant. As such, the 2009 Policy adopted the objective 'to support and promote

development of small-scale mining so as to increase its contribution to the economy' (URT, 2009). According to the policy document, this objective was to be achieved by:

(i) Developing and implementing programmes to transform and upgrade small-scale mining into organised and modernised mining;

(ii) Cooperating with stakeholders to facilitate small-scale miners to access markets for minerals, geological information, technical and financial services; and

(iii) Continuing to collaborate with stakeholders to ensure that small-scale miners preserve the environment.

The Mineral Policy of 2009 laid out a number of strategies aimed at changing ASM from being unorganised, unsafe and with negative environmental impacts. These included:

- Recognising ASM within the legal framework;
- Providing support services to ASM;
- Establishing formal marketing channels;
- Rationalising ASM through promoting more organised operations that comply with the principles of small-scale business enterprises.

Further details on the current policy and legislation governing ASM in Tanzania are given in the tables below.

Table 3. National policies relevant to ASM

Policy	Policy objectives relevant to ASM	Additional details
The Mineral Policy, 2009	1. Support and promote development of small-scale mining so as to increase its contribution to the economy	*Examples of government strategies:*
	2. Facilitate, support and promote increased participation of Tanzanians in gemstone mining	

Policy	Policy objectives relevant to ASM	Additional details
	3. Strengthen involvement and participation of local communities in mining projects and encourage mining companies to increase corporate social responsibilities	
	4. Promote and develop a marketing system for minerals to ensure that miners get the right price for minerals traded in formal markets	(i) collaborate with stakeholders to develop local minerals market; (ii) harmonise taxes and tariffs on minerals produced in the country to ensure that they are competitive; (iii) source foreign markets for minerals and compile information related to minerals markets in general; (iv) collaborate with the private sector to develop and improve training institutions on mineral marketing, mineral grading and valuation.
	5. Promote safety and maintain hygienic conditions and protect the environment in mining areas	(i) strengthen the institutional capacity in monitoring and enforcement of laws and regulations on safety and occupational health, environmental protection and management in mining areas; (ii) require mining companies to set aside funds for environmental rehabilitation and mine closure obligations; (iii) continue to harmonise laws and regulations governing safety, occupational health and environmental issues in the mineral sector; (iv) continue to collaborate with stakeholders to ensure that small, medium and large-scale miners preserve the environment; (v) continue to provide education on health and safety; HIV/AIDS and environmental management to small, medium and large-scale miners and their surrounding communities; (vi) administer and monitor exploration, mining, handling, transportation, storage, usage and export of radioactive minerals, explosives and toxic materials.

Policy	Policy objectives relevant to ASM	Additional details
	6. Encourage and promote women's participation in mining activities and strengthen enforcement of laws and regulations against child labour in mining activities	(i) continue to promote participation of women in mining activities; (ii) ensure that all programmes related to mining, including education and training opportunities, are based on gender equality and equity; (iii) collaborate with stakeholders to strengthen monitoring and enforcement of laws and regulations on child labour in mining activities.
The National Environmental Policy (NEP), 1997	This policy aims to achieve sustainable development through rational use of natural resources and incorporating measures in any development activities in order to safeguard the environment. The NEP seeks to provide the framework for making the fundamental changes needed to bring environmental considerations into the mainstream of decision-making in the country.	*Measures related to ASM:* • Overall project cycle of mining (including reclamation and restoration of land after use) shall be adequately managed to minimise adverse environmental impacts; • Mining discharge to grounds and water shall be controlled; • Preventive and clean-up measures for accidents shall be formulated and implemented; • Air pollution from mining areas shall be controlled; • Strict regulations shall be put in place to control the use of mercury in mining activities, use of retorts will be promoted; • Regular and periodic environmental audits shall be maintained to ensure the adoption of environmentally sound practices in mining operations.
(a) The National Land Policy, 1997	The Policy advocates the protection of land resources from degradation for sustainable development.	*Issues relevant to ASM:* Land use planning, land capability, effective management of coastal, urban and rural land resources. Resource sharing and multiple land use techniques in areas of conflicting land use are promoted by the Policy.

Policy	Policy objectives relevant to ASM	Additional details
(b) The National Water Policy (NAWAPO), 2002	The main objective of the National Water Policy is to develop a comprehensive framework for sustainable development and management of the nation's water resources, and establish an effective legal and institutional framework for its implementation.	The NAWAPO recognises the fundamental but intricate linkages between water and socio-economic development, including mining operations. The policy calls for integrated water resource management in Tanzania and highlights the importance of water for domestic use, agriculture, livestock keeping, mining, energy, fisheries, environment, wildlife and tourism, forestry, navigation and trans boundary requirements.
The HIV/AIDS Policy, 2001	Specific objectives of this policy include: • Prevention of transmission of HIV/AIDS; • HIV testing; • Care for people who are living with HIV/AIDS; • Sectoral roles and financing; • Participation in HIV/AIDS research nationally and internationally.	Mining areas are among areas with high HIV rates (Mwaipopo *et al.*, 2004). In order to protect the ASM community against the AIDS pandemic, it is important to make available facilities for testing, counselling and care.
The National Gender Policy, 2002	Overall objective is to promote gender equality and equal participation of men and women in economic, cultural and political matters, and focus on equitable opportunities for women and men, as well as access to education, childcare, employment and decision making.	It is imperative that ASM operators work closely with the respective district councils to promote gender equality and equal participation of men and women in ASM operations.

Table 4. National legislation relevant to ASM

Legislation	Relevance to ASM	Additional details
The Mining Act, 2010 (and as amended in 2017) – (see The Written Laws (Miscellaneous Amendments) Act, CAP 123, 2017)	The Mining Act 2010 is the principal piece of legislation for the management of all mining activities in the country. It has provisions for the issuance of mineral rights for ASM, i.e. provisions for application, grant, renewal, conversion and the allocation of rights in areas dedicated to ASM. The act also provides the rights for provisions of processing, smelting and refining licences, and provides for licences to trade in minerals The "Natural Wealth and Resources (Permanent Sovereignty) Act, 2017" aims to ensure that the people of the United Republic of Tanzania have permanent sovereignty over all natural wealth and resources. It also provides for the ownership and control over natural wealth and resources to be exercised by and through the government on behalf of the people and the United Republic of Tanzania. The Act also ensures that no raw resources are exported for beneficiation outside of the country. It also provides for retention of earnings from natural wealth and resources within banks and financial institutions established in the country. In line with the provisions of the Constitution, the Act requires that permanent sovereignty over natural wealth and resources shall not be a subject of proceedings in any foreign court or tribunal. Under this Act, the National Assembly may review any agreement for extraction, exploitation or acquisition and use of natural wealth and resources.	In addition to the amendment of the Mining Act, 2010, the following legislation was introduced: i) The Natural Wealth and Resources (Permanent Sovereignty) Act, 2017 ii) The Natural Wealth and Resources Contracts (Review and Re-negotiation of Unconscionable Terms) Act, 2017 Other subsidiary legislation under this act that is applicable to ASM include: • The Mining Act (Mineral Rights) Regulations, 2018 • The Mining (Minerals and Mineral Concentrates Trading) Regulations, 2018 • The Mining (Local Contents) Regulations, 2018 • The Mining (Mineral Beneficiation) Regulations, 2018 • The Mining (Audit and Inspection of Records), Regulations 2018
Land Legislation	The Land Act (No. 4), 1999, The Village Land Act (No. 7), 1999, the National Land Use Planning Act (No.6), 2007 and Village Planning and Regulations (No. 58), 2007.	One of the pertinent issues in ASM is dealing with conflicts over land where there are other land users.

Legislation	Relevance to ASM	Additional details
Environmental Legislation and Regulations	The Environmental Management Act (EMA), 2004, is the principal piece of legislation that governs the regulation of environmental management in Tanzania. Section 81(1) of EMA requires any developer of a project specified in the Third Schedule of the Act, to undertake an environmental impact assessment. Section 3 of Part II of the Mining (Environmental Protection for Small Scale Mining) Regulations 2010, requires that the "Holder of Primary Mining Licence shall, before commencing mining operations, conduct a baseline environmental investigation and social study with regard to human settlement, burial sites, cultural heritage sites, water, vegetation, animals and soil, and submit a report regarding the outcome of the investigation and environmental protection plan to mitigate the environmental effects to be caused by mining operations in the licenced area".	According to the Third Schedule of this Act, 'Mining including quarrying and open cast extraction' is one of the projects for which an EIA is mandatory. However, the First Schedule of the Environmental Impact Assessment and Audit Regulations, 2005, puts "artisanal and Small-scale Mining" in the "List of Small-Scale Activities and Enterprises that require Registration with NEMC" in order to determine whether they require an EIA or not. The conflicting regulations within a fragile sector like ASM have resulted in the operators carrying out their activities with no regard to environmental management. Licences continue to be issued by the same institutions that have the responsibility to enforce these regulations.
Health and safety legislation and regulations	The Occupational Health and Safety Act, 2003 regulates the health and safety for all industries including mining, which is also regulated by the Mining Act of 2010. The Mining (Safety, Occupational Health and Environmental Protection) Regulations 2010 provide specific regulations for health and safety in mines.	Although most of the provisions in this legislation target the large-scale mining operations, the ASM sector is also expected to comply with to the level linked to their operations. Although ASM is also expected to abide by some of the provisions of these regulations, there is no specific OHS legislation for ASM.

3.3 Known challenges for the sustainability of ASM in Tanzania

The ASM sector has always faced challenges, including limited access to mining land, long delays to register primary mining licences, inadequate extension services to improve skills and care for the environment, poor market arrangements, and lack of opportunities for value-addition. The Ministry of Minerals has taken a number of measures to address these, including restructuring the Mineral Department by establishing a Small-Scale Mining Development Section and setting aside several areas designated for ASM activities in active mining districts. For example, for the year 2016/2017 the government set aside areas for ASM in Msasa and Matabe (Geita), Biharamulo and Kyerwa (Kagera), Itigi (Singida), D-Reef, Ibindi and Kapanda (Katavi), Ngapa (Ruvuma), Nzega (Tabora) and Kitowelo (Lindi), covering a total area of 38,951.7 hectares (Budget Speech of the Minister of Energy and Minerals 2016/2017).

ASM in Tanzania is gradually becoming better organised, employing appropriate technology, having access to reliable markets, and putting in place programmes for environmental, health and safety management. These emerging operations, which are mainly found in gold mining and gemstone (specifically tanzanite) mining, operate within the legislative requirements, and keep proper records that they furnish to the relevant authorities. It should be noted, however, that this group is still small, leaving the majority of operations in what would be typically referred to as 'artisanal' operations functioning:

- On an informal basis without adhering to established laws, regulations and technology;
- By shifting from one site to another, working in both licensed and unlicensed lands;
- With no work preparation and organisation before production, hence the prospecting stage is totally omitted and there is no mineral reserve estimation;
- As if it were a mine development operation (with no closure phase);
- With informal sources of funding for mining operations and mineral trading;
- Where production-sharing arrangements dominate the interests of all key stakeholders in mining activities.

ASM operations in Tanzania, like in many other countries, are associated with:

- The lack of a systematic exploration process that would enable resource evaluation and estimation of mineable reserves;
- Considerable wastage of minerals due to poor ore recovery during mining processes and low mineral recovery in mineral processing due to inefficient use of processing technologies;
- Poor planning and management of the mining process that results in wide dispersal of mine waste products and tailings;
- Lack of mine closure plans, which leads to widespread and hazardously situated mined-out and un-reclaimed pits.

3.3.1 Health, safety and the environment

Mining is considered the world's most dangerous occupation (Kisner, 2000). Statistics from the MEM show that 125 mining-related accidents and 123 deaths were recorded in registered sites (PML) from 2008 to May 2017, with 56 accidents and 140 deaths in unregistered (illegal) sites (MEM, 2017). A combination of lack of resources, lack or non-application of safety regulations, lack of awareness, illiteracy, lack of training, inadequate equipment, and remoteness of locations point to the likelihood of more accidents in small-scale mining operations than in larger, more formal, mines (ILO, 1999).

Most ASM areas also have high crime and violence rates. There have been extensive reports of human rights violations in the form of child labour. In 2003 it was found that 2,723 children between the ages of 12 and 15 were working in the tanzanite mines of Mirerani (ILO, 2003). In gold mining, the majority of children were employed in the reprocessing of tailings, manual crushing and grinding, and washing in sluice boxes. These activities are thought to have the worst health impacts as they involve exposure to mercury. There have been improvements following intervention and awareness campaigns by various stakeholders. For example, Danish development assistance provided funding to TAMICO, Arusha Women's Legal Aid, and the Human Rights Centre that reportedly stopped 243 children from working in artisanal and small-scale tanzanite mines in Mirerani (Human Rights, 2013). Child labour continues to be a major concern, however, with local authorities ill equipped to respond with increased pressures on welfare services and policing.

Occupational health and personal safety issues are frequently on the agenda when ASM issues are discussed, but in most cases official statistics about accidents or occupational diseases are not available (Hentschel *et al.,* 2002). According to the ILO (1999) there are five major health risks in small-scale mining and processing: exposure to dust (silicosis); exposure to mercury and other chemicals; effects of noise and vibration; effects of poor ventilation (heat, humidity, lack of oxygen); and effects of over-exertion, inadequate work

space and inappropriate equipment. Additionally, hygiene is normally a problem inside small-scale mining centres. Since most mines are located in remote areas, they lack adequate sanitation services thus making the miners vulnerable to waterborne diseases such as malaria, dysentery and typhoid fever (Hilson 2002).

Mercury use in gold processing is a threat to the environment and to human health. Mercury has toxic effects on the human nervous, digestive and immune systems, and on lungs, kidneys, skin, eyes and the brain. It also causes neurological damage to children (Veiga *et al.* 2006; WHO 2013). A study by Gunson *et al.* (2006) on the Geita District estimated that 27kg of mercury is released into the environment in the Rwamgasa area each year, while atmospheric emissions from other amalgam burning is about 14kg from the Blue Reef mine site and 7kg from other nearby mine sites, including Nyakagwe and Nyamtondo.

Environmental challenges created by ASM are generally higher than those of other types of mining. There are a great number of individual polluters who in most cases are concentrated in a specific area and this causes significant local impacts (Hentschel *et al*., 2002).

3.3.2 Women in mining

Mining is historically a male-dominated industry. The under-representation of women in Tanzanian mining also reflects social and economic inequalities between men and women. Cultural beliefs and traditions frequently prohibit women from entering mining pits. Women's exclusion in Tanzania is also partly due to poor tools that require masculine power (World Bank, 2015). Women are also discriminated against in the mining sector in terms of access to land and allocation of mineral rights (Reid, 2004).

According to the World Bank (2015), there are 20 to 30 million people globally who are engaged in ASM, and between 10 and 50 per cent are women. In Asia, less than 10 per cent of miners are women, whereas in Latin America the proportion tends to be higher, approximately 10– 20 per cent. The percentage of female ASM operators is highest in Africa, averaging between 40 and 50 per cent. In some regions, the ASM workforce is comprised of more than 60 per cent women (ILO, 1999; Amutabi and Lutta-Mukhebi, 2001; Onuh, 2002; Anon., 2002). Women are more involved in ASM than in the large-scale mining sector (WMMF, 2000). A study of gender issues in small-scale mining in Mukibiri, Kenya (Amutabi *et al*, 2001) indicates that women play a central part in artisanal mining, that women tend to spend the proceeds from mining on their families, and that women pass down their expertise to younger generations. Women in ASM who organise themselves in groups tend to use economies of scale and are better off than those who conduct their mining business on their own (UN Women, 2016).

According to the ASM baseline survey conducted by MEM in 2011/12, women's involvement in Tanzanian ASM accounts for 27 per cent. Women undertake different activities ranging from labour-intensive mining to processing. Although women carry out an important role in the ASM labour force, there is little information on the roles of women in ASM and even fewer accounts describing the living experiences of individual women miners. As women often work part-time at informal mining operations, and occupy 'ancillary roles' such as cooking and service provision, there may be significant discrepancies between the estimated and actual numbers of women involved in ASM (Wasserman, 1999). Furthermore, as women are more frequently associated with transporting and processing materials, as opposed to digging, they are not always identified as 'miners' (Susapu and Crispin, 2001).

3.3.3 The interface between ASM and LSM

Interactions between artisanal and small-scale miners and large-scale miners have a long history in Tanzania. Competition for the same resources usually forces interaction between the different scales of mining in the same areas. Interaction also happens in the regulatory agencies as all mining activities in the country are regulated through the same policy and legislation. Most ASM activities begin through luck or word of mouth about the existence of minerals, and there is usually limited knowledge and appreciation of the requirements of the law. As a result, ASM operations sometimes find themselves in areas already licensed to LSM or even to their fellow ASM operators who are knowledgeable about the legal requirements. Such cases often lead to evictions and complaints of unfair treatment by the government.

Prior to the 1990s, the mining industry in Tanzania was dominated by ASM. Reforms undertaken in the 1990s attracted LSM companies to invest in Tanzania, which were given rights to invest in areas where ASM was already a main source of livelihood (IFC, 2013). The shared prosperity, which was expected, did not materialise, leading to frustrations, tensions and growing conflict between ASM and LSM companies, and in some instances leading to fatalities and disruption of operations. For example, in the Lake Victoria Gold Field, most mining prior to the 1998 Mining Act was being carried out by informal artisanal miners; following the enactment of the Mining Act, foreign investors were allocated exploration licences in the same areas. Most ASM operations at the time were not licensed and hence miners were evicted. The evictions resulted in hostilities between the two groups (Nicolas, *et al.* 2016) and a number of deaths have been reported over the years.

Where ASM and LSM operate in the same neighbourhood, there are often no channels for communication. LSM often accuse ASM of invading their areas and operations, polluting the environment, and blame them for the deterioration of security, while ASM accuse LSM of taking their land, being unfairly favoured by government, and deliberately polluting their resources (mainly water). Without a platform for discussion and negotiation, the result is conflicts. For the LSM these conflicts have resulted in loss of property, disrupted production, higher operating costs due to increased security costs and international reputational damage. In 2009 African Barrick Gold claimed that illegal mining resulted in the loss of 2,400 hours of production (Hall, A. 2010). An ICMM study concluded that ASM conflicts are 'possibly the single most important factor that negatively colours attitudes to the international mines' (ICMM, 2007). Reputational risk is primarily related to security-related incidents and environmental impacts, which are difficult to trace back to the source.

Gold amalgam, mixed with mercury, Geita, Tanzania (Brian Sokol/Panos Pictures)

4 Stakeholder mapping in Tanzania

The identification of ASM stakeholders was a key component of the pre-dialogue process in the Tanzania national dialogue. To be successful the ASM dialogue process needs to engage stakeholders in order to identify the major issues and to understand the knowledge and perspectives of the key players.

4.1 Government institutions responsible for ASM administration

A number of government institutions have a mandate for regulation of ASM operations, from national to village level (see Table 5)

Table 5. Government institutions responsible for ASM administration

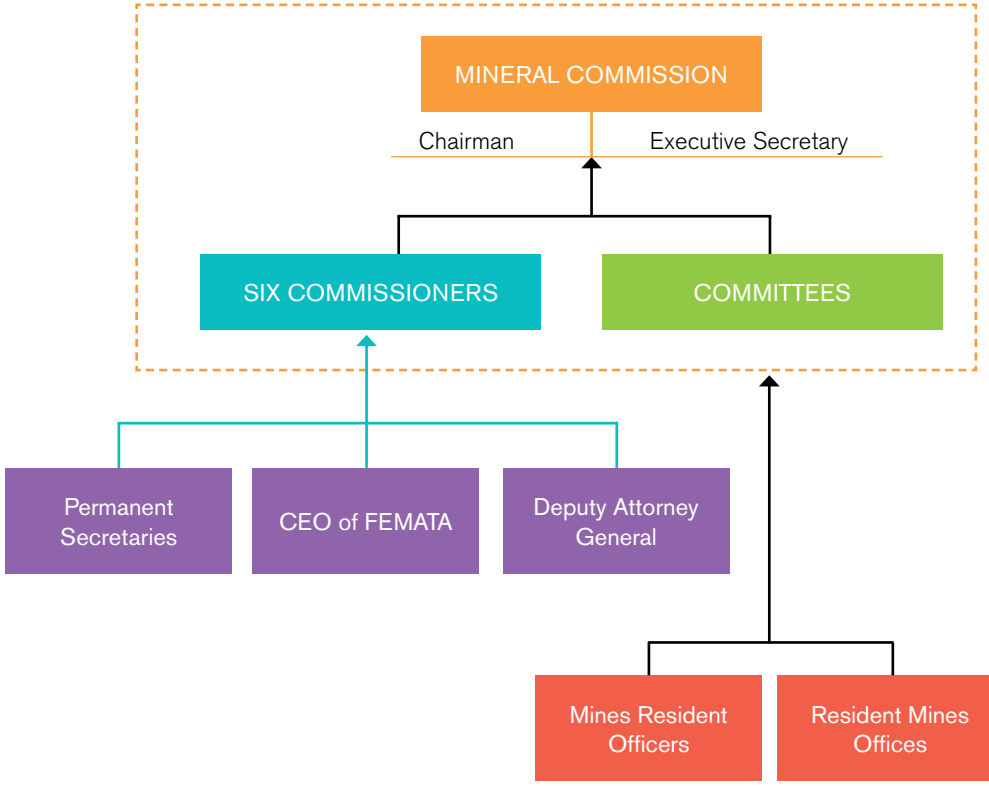
Level	Institution	Role and responsibility
Ministry level	Ministry of Minerals	This is the national regulatory authority responsible for issuing licences for ASM and enforcement of laws and regulations in accordance with the Mining Act, 2010.
	Ministry of Water and Irrigation (MWI)	MWI is responsible for issuing water use permits, enforcing laws and regulation of water quality and utilisation, as well as permitted discharge levels.
	Ministry of Land, Housing and Human Settlements Development	This is the national regulatory authority for issuing rights of occupancy on land, overseeing land use planning and issues relating to compensation and physical and economic resettlement.
	Ministry of Natural Resources and Tourism: Forestry and Archaeology and Cultural Heritage Divisions	The ministry is responsible for management of forest reserves, national parks and wildlife protected areas and protection of cultural resources. It plays a key role when ASM operations conflict with protected areas and cultural resources.
	Vice President's Office: (Division of Environment) (VPO-DoE)	This has responsibility for planning and implementation of all the environmental matters and articulation of policy and guidelines for promotion and protection of the environment.
	Vice President's Office: National Environment Management Council (NEMC)	This is the national authority on environmental issues. It enforces national environmental legislation and regulations and advises the minister responsible for environment on all technical matters related to the environment.
	Ministry of Trade and Industry	This is the ministry responsible for issuing all business licences and regulation and monitoring of businesses and trading practices.

Level	Institution	Role and responsibility
Agency level	Basin Water Offices	These are responsible for overall management of water resources in their respective basins. They issue water abstraction and discharge permits.
	Resident mine offices	These are responsible for overseeing mining regulations in relation to safety, security and licensing; and the sustainable exploitation of mineral resources in the area.
	Occupational Safety and Health Authority (OSHA)	The authority is responsible for occupational health and safety in workplaces and the respective surrounding environment. It is responsible for enforcing the OHS Act No.4 (2003).
	Government Chemist Laboratory Agency – Southern Highland Zone	This agency deals with permits relating to chemical handling, management, usage and disposal.
	Existing community institutions such as schools, police posts, churches, mosques, hospitals, community-based organisations (CBOs), NGOs and SACCOS	These institutions are responsible for the provision of social services including health, education, safety, security and worship, and also take part in observing environmental issues.
Regional level	Regional Commissioner's Office	Central government office at the regional level responsible for overseeing development issues, peace and security and coordination of local government institutions in the region.
District level	District Commissioner's Office	Central government office at the district level responsible for overseeing development issues, peace and security and coordination of local government institutions in the district.
	District/town/municipal/ city councils	Local government at district level responsible for development activities and provision of social services such as health and education.
Village level	Village governments	These are responsible for • Land ownership under Village Land Act, 1999 • Peace and security at village level • Overseeing development activities and provision of social services

Source: MTL Consulting, field research conducted during 2017

Mining Act changes in 2017: Following the July 2017 amendments to the Mining Act of 2010 (see The Written Laws (Miscellaneous Amendments) Act, CAP 123, 2017), all licensing activities are undertaken by the newly established Minerals Commission's Office. Instead of ZMOs it is proposed that the Minerals Commission has a full-time chair, with its day-to-day activities run by a full-time executive secretary supported by two eminent persons with proven knowledge and experience in mining (Figure 6). Six commissioners consisting of four permanent secretaries, the Chief Executive Officer of the Federation of Miners Association of Tanzania and the Deputy Attorney General will support the commission. In addition, in order to facilitate the functions of the Commission a number of committees will be formed. The resident mines offices (RMOs) will continue to function, and the monitoring and inspection of operating mines will be undertaken by Mines Resident Officers who will be posted at each mine by the Commission. The Commission will have powers to appoint officers and staff for the proper discharge of its functions.

Figure 6. Minerals Commission structure as per July 2017 amendment of Mining Act 2010



Note: At the time of writing, changes were still taking place, and the definitive structure was yet to be finalised.

The State Mining Corporation (STAMICO)

STAMICO is a public parastatal under the MEM, established by the Public Corporation Act CAP 257 through State Mining Corporation Establishment Order No.163 of 1972, as amended in 2014**.** Following major economic policy reforms in the late 1980s and early 1990s, a Public Corporations Act, 1992, was enacted, which disbarred public holding corporations, including STAMICO, from ownership of subsidiary companies. The Mineral Policy of 2009 expressed the intention of the government to participate in investments in mining through its institutions and the development of small-scale mining. In line with new policy, the Mining Act, 2010 provides for free-carried interest in mining ventures for the government. STAMICO was re-established in 2014 and has the following functions:

- To oversee government interests in large scale mines;
- To invest in the mining sector through mineral exploration and prospecting, development and operation of mines and mineral trading;
- To carry out commercial services in the mineral and other related sectors such as drilling, exploration and consultancy services;
- To coordinate the transformation of artisanal and small-scale mining into a regulated, environmentally friendly, safe, productive and sustainable operation.

The fourth function makes STAMICO a key player in the development of ASM in Tanzania. The corporation is currently undergoing transformation to enable it to have the required resources to undertake its new functions. Within its structure, STAMICO has a Small-Scale Mining Department headed by a manager under the Directorate of Mining and Engineering Services.

Geological Survey of Tanzania (GST)

The GST is a government agency responsible for the acquisition and storage of geo-scientific data and information used in the utilisation of natural resources. Since its establishment in 1925, the agency has undergone various organisational and administrative changes under different ministries. In 2005, it was transformed into a government executive agency under the Executive Agencies Act No 30 of 1997 and was officially launched as a government agency on 23 June 2006 as the Geological Survey of Tanzania (GST). The current functions of GST include:

- To produce, maintain, archive and disseminate national geo-scientific data and information.
- To conduct environmental studies (mining effects, pollution and waste disposal) and assessment of geo-hazards (earthquakes, volcanoes, landslides) and their risks and mitigations.

Regional and local government authorities

In Tanzania, community-level social, economic and development activities fall under the mandate of the local government as represented by the district, town, municipal and city councils. The Minerals Department is still centralised and has no permanent representation in local government management teams like other similar departments (eg, Forestry, Wildlife, Land, Environment). As such, this arrangement leaves local government out of decision making and management of the mineral sector. With no direct links to the local government units that determine and manage local development, ASM areas are usually a low priority. The low priority given by local governments to ASM areas also emanates from the fact that they do not collect any revenues from ASM activities. All mineral rents are paid directly to central government through the RMO and ZMO offices.

4.2 Associations

Associations within the mining sector are also actively involved in various ways and have the potential to provide support to miners and influence change for better policy and practice.

Regional miners' associations (REMAs)

In order to enhance management capacity in the ASM sub-sector, in 1987 the government initiated the formation of regional miners' associations (REMAs). These associations were to bring together miners working with different mineral commodities and provide a platform for the development of organised operations. The establishment of the REMAs was intended to provide channels through which assistance from government and other interested parties would be passed. REMAs were to encourage establishment of legal mining operations by ensuring that only licensed operators were members of the respective association. The REMAs' representation of miners subsequently declined however due to a clash of interests between leaders and members: it was contended that the leadership failed to identify with the miners, with most of them pursuing their business interests rather than being engaged in actual mining matters. Most REMAs operate based on their members' contributions (fees), which makes most of them unable to sustain administrative costs. With miners gradually losing confidence in their leadership, there has been a decline in membership and hence contributions.

To ease these problems REMAs now work within an umbrella organisation known as the Federation of Miners Associations (FEMATA), which was established in 1984. FEMATA was formed to provide a platform for the REMAs to have a voice. The federation is run through a board composed of representatives from the REMAs and has a full-time Chief Executive Officer (CEO) who runs the day-to-day operations. Through the federation,

REMAs are able to negotiate with government and other local and international agencies on behalf of their members.

Tanzania Mineral Dealers Association (TAMIDA)

TAMIDA was formed in 1989 in Arusha and began functioning in 1990. The Association was formed to represent all mineral dealers, but the dominance of the tanzanite dealers based in Arusha has made it less popular with other mineral dealers in other parts of the country. Licensed mineral dealers formed TAMIDA as a link to the government for the advancement of the mining sector in the country, and to improve the mining sector through proper rules and regulations. TAMIDA aims to help increase national income from mineral trading and to foster a more conducive environment for members to buy and export gemstones in line with government directives. Key roles of the Association include:

- Cooperating with all relevant government agencies to ensure efficient revenue collection, favourable taxes and levy rates, reduction of harmful taxes and levies, security and easy transportation within and outside the country;
- Advising government on strategies to ensure mineral resources are used for the betterment of the nation, policies for gemstone dealing activities and their implementation, and issuance of licences to benefit both ASM and LSM;
- Conducting research to understand mineral markets, advertise local minerals in international markets, organise trips for miners and dealers to exhibitions;
- Creating systems to control production, preparation and selling of minerals and gemstones and advising relevant authorities on the same;
- Advising ASM and gemstone dealers on the value of tanzanite.

Tanzania Women Miners Association (TAWOMA)

In 1997 women artisanal and small-scale miners came together to form their own organisation, TAWOMA, headquartered in Dar es Salaam. The Association was formed with the aim of facilitating women miners to organise and access the required financial, technical and marketing services to enable them to carry out mining activities that are both economically viable and environmentally sustainable; and thereby raise the standard of living of women miners and their families. The functions of TAWOMA are:

- To lobby for support and recognition of women in mining nationally, regionally and internationally;
- To identify training and technical needs of women miners and organise the resources required to meet these needs;
- To provide relevant market information and facilitate the marketing of mineral products;

- To set up a revolving fund to enable women miners to access the necessary funding required for their operations;
- To advocate for women in the mining sector to the government on policy issues (gender mainstreaming) and constraints faced by women (MTL, 2008).

TAWOMA has successfully served as an advocate for the development of women in small-scale mining, and has seen substantial increases in membership and the opening of branches in all major towns in the country. The Association's organisational structure includes a management committee supervised by the Executive Council, comprising of representatives from all mining areas where TAWOMA has members, which undertakes the day-to-day running of the Association's affairs.

Since its inception in 1997, TAWOMA has achieved the following:

- Lobbied and succeeded in securing primary prospecting licences and prospecting rights for its members from the government;
- Initiated workshops for mining communities at grassroots level, for poverty alleviation, and/or eradication, and raising HIV/AIDS awareness in society;
- In collaboration with other institutions, facilitated skills training as well as education for its members;
- Identified market links for gemstones to foreign markets (Japan, India, USA, Kenya, South Africa, China, Canada, Thailand, and Italy);
- Was selected as a model association, and participated in a ten-day Trade Finance Clinic, facilitated by the World Bank in Washington in July 2005;
- Members have received training on: entrepreneurship, identification of minerals, health, environment, and use of mercury and management – organised by the MEM, AMGC, UNIDO, SIDO, World Bank, SME Competitive Facility, IFC and DFID;
- Was a founding member Association of Tanzania Women Chamber of Commerce (TWCC), which is mobilising women entrepreneurs all over the country.[3]

Figure 7 below depicts most of the key institutions in Tanzania's ASM sector and how they relate to each other.

[3] Direct consultations with the TAWOMA leadership in Dar es Salaam.

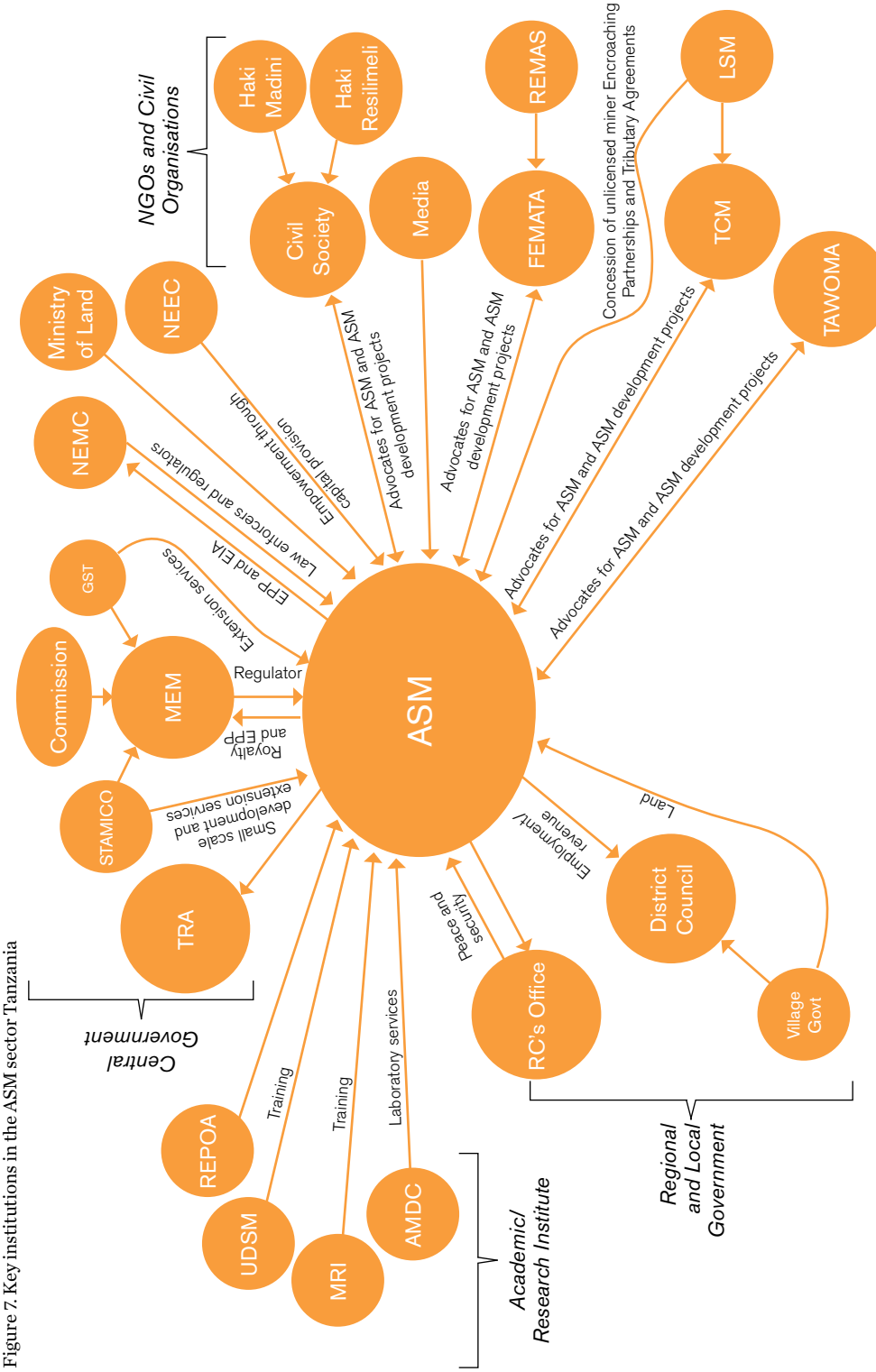


Figure 7. Key institutions in the ASM sector Tanzania

Source: MTL Consulting, field research conducted during 2017

4.3 ASM stakeholders as change agents

The ASM dialogue aims to accelerate progress towards a more inclusive and responsible mining sector in Tanzania through improved multi-stakeholder collaboration. As such, it is important to understand the significance of each stakeholder as a change agent. Table 6 below identifies the stakeholders and their roles.

Table 6. Role of relevant stakeholders as change agents

Stakeholder	Role as a change agent
Government agencies	
Minerals Division at MEM	• Through RMOs, provide extension services in the areas of technology, legal and regulatory issues, minerals marketing among others; • Organise minerals auctions to help miners to access competitive markets; • Simplify the ASM governance system and provide financial grants to ASM; • Collaborate with other relevant agencies, eg, land, local governments, natural resources, to address conflicts between ASM and other land users; • Collaborate with Tanzania Revenue Authority to review and simplify taxation system and improve incentives; • Develop buying centres in mining areas from where licensed brokers can operate; • Share information on mineral licensing with village governments to allow them to undertake land use planning of their areas; • Provide information on mineral markets and mineral prices for ASM through social media and/or billboards in areas that are easily accessible for ASM; • Organise and conduct training aimed at educating financial institutions on the opportunities available from the ASM sector.
STAMICO	• In collaboration with GST, conduct exploration and drilling in ASM designated areas and provide geological data; • Conduct training in collaboration with RMOs on issues of technology, environment, health and safety;
GST	• In collaboration with STAMICO, conduct exploration and drilling in ASM designated areas and provide geological data; • Conduct awareness campaigns for ASM on the services that GST can provide, eg laboratory services and geological investigations.
SIDO	• In collaboration with MEM, STAMICO and GST, investigate technological requirements for ASM and develop appropriate equipment and tools to meet their needs while protecting the environment.

Stakeholder	Role as a change agent
VETA	• In collaboration with MEM, conduct field investigations in ASM areas and assess training needs; • Develop and conduct skill-based training modules to fit the needs and working environment of ASM.
NEEC	• In collaboration with MEM through RMO's, facilitate designing, planning, supervising, monitoring and evaluating and coordinating ASM empowerment activities; • Mobilise resources and manage special funds for ASM economic empowerment activities.
NEMC	• Work closely with MEM to provide training and awareness raising for ASM on environmental management of their mining operations; • In collaboration with MEM, develop simplified guidelines to assist ASM in the preparation of the environmental protection plan as required by law; • Conduct monitoring of ASM operations to ensure compliance with environmental regulations and use monitoring data for improvement of environmental management within ASM; • Conduct training and awareness raising for local government authorities and relevant agencies on environmental management and legal requirements.
Mining associations and civil society organisations	
FEMATA	• Conduct awareness campaigns amongst ASM and ensure all participants in the sub-sector are members of the relevant organisation; • Mobilise and raise awareness of members to ensure all ASM operations are carried out in line with regulatory requirements; • In collaboration with MEM and other relevant agencies organise and train members on the various regulatory requirements, access to markets, mineral prices, technological requirements, access to finance, health, safety and environmental requirements and other related subjects; • In collaboration with MEM and other relevant agencies, develop code of conduct for their members to ensure compliance with relevant legislation; • Provide platform for ASM participants to have a voice and air their views during negotiations with government, changing of policies and laws, etc.
GEREMA	
MAREMA	
TAWOMA	
TAMIDA	
Chamber of Minerals and Energy	
NRGI	• Provide policy advice and advocacy based on lessons learned in the field and with insights developed through rigorous research; • Share knowledge and experience with policy makers and accountability actors; • Convene reform-oriented dialogue and engage in constructive policy advocacy.

Stakeholder	Role as a change agent
Mining associations and civil society organisations (continued)	
Policy Forum	• Work closely with relevant NGOs to influence the policy process and thus ensure that the Mining Policy addresses fully the needs of ASM and that it helps in poverty alleviation, empowering women to fully participate in ASM, discouraging gender discrimination in ASM operations and working to eliminate child labour.
HAKIARDHI	• In collaboration with other relevant NGOs, conduct awareness campaigns in ASM communities aiming at raising their understanding of land issues that will lead to reduction of conflicts between ASM and other land users; • Organise and conduct training of ASM and other stakeholders on land legislation and regulations.
Private sector	
Financial institutions	
TIB Development Bank	• Conduct field surveys aimed at understanding ASM operations and exchanging ideas with participants on the opportunities available in the sector; • Develop ASM-specific tailored products to encourage participants to seek and access financing from the institutions.
National Bank of Commerce (NBC)	
National Microfinance Bank (NMB)	
World Bank	• Through the Multi-Stakeholder Partnership Initiative Framework Agreement that was entered into with other parties for the development of ASM, provide funding and expand the programme to develop projects in other ASM areas in the country; • Conduct consultations with the different international agencies with ASM projects in the country to work together and develop and implement a collaborative agenda for ASM development.

Stakeholder	Role as a change agent
Large-scale mining companies	
AngloGold Ashanti – Geita Gold Mine Petra Diamond-Williamson Diamond Mine Acacia Mining PLC	• Through the corporate social responsibility programmes in surrounding areas, work with communities with the aim of improving relationships with ASM and other members of the community; • In collaboration with local governments (DC, DED and village governments), organise and implement regular consultations with surrounding ASM communities; • Through the Multi-Stakeholder Partnership Initiative Framework Agreement, continue to support the development of model ASM projects in the surrounding areas; • Collaborate with other development agencies, including NGOs, to organise and implement programmes that aim to transform and formalise the ASM sector whilst ensuring health, safety and environmental standards are upheld.
Regional and international organisations	
Local and International NGOs Solidaridad Fairtrade Gold Africa	• Conduct field surveys to develop good understanding of the ASM sub-sector and its associated issues; • Develop and implement programmes aimed at development of the sub-sector, reducing conflicts with other land users, empowering miners to understand and defend their rights, encouraging women's participation, abolishing child labour in mines, etc. • Develop and implement programmes to enable miners to access fair markets whilst adhering to fair mining conditions, eg, upholding safety and environmental standards, removing children from employment, encouraging fair working conditions for workers and other internationally accepted standards.
UN-Women	• Conduct field studies and develop understanding of the ASM sector and its related issues with specific attention to issues limiting full participation of women in mining; • Develop and implement programmes aimed at promoting full participation of women in ASM, improve their ability to access financing, markets, appropriate technology and enhance their overall understanding of mining business management.

Stakeholder	Role as a change agent
African Minerals Geo-sciences Centre (AMGC)	• Develop and implement ASM tailored programmes aimed at raising awareness of participants on utilisation of services provided by the centre, eg laboratory services, training in gemstone cutting and polishing, geoscientific data collection and others; • In collaboration with government through RMOs and other development agencies, develop and implement programmes that will enhance understanding, interpretation and utilisation of geological data.
Media	
Local radio FM Newspapers Television stations	• In collaboration with MEM through RMOs, conduct field studies and develop good understanding of ASM and related issues; • Develop and implement programmes aimed at increasing public awareness of ASM; disseminate information and data aimed at promoting ASM and improving its public image.
Academia and research and training organisations	
Mineral Resources Institute University of Dar es Salaam Uongozi Institute	• Conduct field investigations and establish needs assessment for training for ASM; • Develop and implement training programmes aimed at improving performance of the ASM participants in their operations whilst improving health, safety and environmental management; • Conduct targeted research and develop solutions to improve ASM productivity, improve health and safety and working conditions, enable participants to utilise environmentally acceptable working methods, etc.
Other government authorities	
Regional and district authorities Village authorities	• In collaboration with MEM, NEMC and other government agencies, develop and implement programmes that ensure that ASM activities are carried out in dedicated areas and thus reduce conflicts with other land users; • Through the District Environmental Management Office, take an active role to monitor, educate and ensure compliance with environmental management in ASM areas; • Develop a system to keep records of all ASM operations for each village; • Develop land use plans and use these as a tool to resolve conflicts between ASM and other land users.

Source: MTL Consulting, field research conducted during 2017

5 Existing initiatives for more sustainable ASM

To address the challenges facing ASM in Tanzania, a number of initiatives have already been undertaken by the government, private sector and civil societies in order to support development of the sector. These initiatives were identified as part of the pre-dialogue research.

5.1 Decentralisation of MEM licensing

One focus of the 1997 Mining Policy was to 'formalise artisanal miners into small-scale miners and provide extension services'. Over the course of the last decade the Tanzanian government has actively encouraged formalisation of ASM by simplifying procedures for acquiring PMLs, decentralising the MEM licensing system, and transferring inspections and extension service functions to zonal mines offices (ZMO) and resident mines offices (RMO). All PMLs were issued from the ZMOs and ASM mineral rights applicants could also apply through the district office, officially known as the RMO, which then forwarded it to the ZMO for evaluation and issuance of the licence.

As a result of these efforts the number of PMLs had risen dramatically from 35 in 1999 to 9,829 in 2013 before dropping slightly to 5,171 in 2016 (see figure 4). The rapid growth in the number of miners agreeing to formalise (to register a PML and operate under the provisions of the Mining Act of 2010) indicates that ASM is seen as an important formal economic activity in rural areas. Consultations with STAMICO, however, have indicated that of the 4,737 PMLs taken up by ASM in the 36 government designated areas across the country, only 626 licences were actually active. To address

this challenge, the government, through STAMICO and the GST, has embarked on a programme of exploration in the designated areas to provide ASM with geological data. Consultations with STAMICO revealed that by October 2017 detailed exploration had been carried out in five zoned areas, exploration drilling had been carried out in four of the five explored zoned areas, and GST and STAMICO are interpreting the results (MEM Budgetary presentation, 2017/2018).

A large number of miners are still operating outside the formal system. For every formalised miner, an additional five informal miners are estimated to enter the ASM sector (Nicolas *et al*., 2016). It should be noted that following the 2017 changes in the Mining Act, which removes the ZMOs and entrusts all licensing matters to the new Minerals Commission, it is not yet clear how the system will continue to work. At the time of writing, the Minerals Commission had been set up, while the status of the former ZMOs is not known.

5.2 Cancellation of inactive licences

The MEM has been undertaking initiatives to monitor all the licence owners to ensure that they work according to the requirements provided in their licence, and has cancelled inactive licences. For example, from June 2016 to April 2017, a total of 2,153 licences were cancelled, of which 72 were exploration licences, and 2,081 were for small-scale mining. The MEM has also been issuing default notices to defaulters, with 243 already issued to owners of exploration licences, 13 to owners of medium-scale mining licences and 2,186 to PML owners (MEM, Financial budgetary presentation, 2017). The cancellation of licences provides more land for access by genuine ASM applicants.

5.3 Preparation of environmental protection plan (EPP) guidelines

One of the requirements for PML owners to start operations is to prepare an environmental protection plan (EPP) to show how they plan to protect the environment during their mining operations. The MEM recognised that it is a challenge for most ASM operators to prepare these EPPs and that the environmental overseer, the NEMC, does not always recognise the EPPs that have been prepared. Consequently, the MEM launched the Sustainable Management of Mineral Resources Project (SMMRP) to address the issue. The initiative brought together MEM and NEMC to develop a tool that would meet the requirements of both agencies' legislation. A consultant was appointed in February 2017 to work with NEMC, conduct stakeholder engagement, undertake field

investigations, and develop simplified guidelines that would assist ASM to prepare an EPP for their operations.[4]

5.4 ASM health related train-the-trainer programme

In 2006 the Tanzanian government partnered with the United Nations Industrial Development Organization (UNIDO) to develop a 'Manual for Training Artisanal Miners' (Veiga *et al*., 2006) and create training programmes in selected artisanal and small-scale gold mining (ASGM) communities in Geita District. The initiative involved a 'train-the-trainer' exercise in which a team of local mining engineers, nurses, environmental management specialists, and others worked together to implement a programme of capacity building at selected sites. Four booklets (in Swahili) conveyed some of the main themes of the training including: 'Mercury and health'; 'How to use and re-use mercury'; 'How to protect your water'; and 'How to get more gold'.

According to project evaluation reports, this led to noticeable improvements in gold extraction practices, including the uptake of retorts, the construction of safely protected amalgamation ponds, and related environmental management safeguards (Chouinard and Veiga, 2008). This was also observed during the pre-dialogue field visit but this is common to PML owners only; the majority of other artisanal miners do not have safely designed amalgamation ponds. Although the work and achievements of the global mercury project did not continue beyond the project, awareness of the impacts associated with mercury and measures to minimise these impacts, eg, the use of concreted washing bays, remains.

5.5 Efforts to create peaceful co-existence between ASM and LSM

In June 2013 the government of Tanzania, World Bank, GGM, African Barrick Gold and FEMATA entered into the Multi-Stakeholder Partnership Initiative (MSPI) Framework Agreement. The MSPI aimed to assist the development of ASM and thus create a more conducive environment for both ASM and LSM. This was to be achieved through:

- Improving viability of ASM operations and in turn miners' incomes;
- Improving miners' knowledge and skills;
- Improving access to finance, equipment, technology and markets;

[4] At the time of writing this report, the guidelines had been approved by the MEM and are awaiting World Bank approval before they can be rolled out for implementation.

- Reducing negative social, health and environmental impacts like mercury exposure, land degradation, child labour, gender inequality and unsafe and exploitative working conditions.

The first pilot project of this programme was launched with funding support from Anglo-Gold Ashanti (a member of the MSPI) at Rwamgasa mining village in May 2014. MTL Consulting Company Limited was contracted to undertake the ASM Formalization Project – Consultancy for Third Party Implementer: Development of a Detailed Project Plan. Under this project the consultant could only carry out studies in Geita with ASM sites provided by Geita Gold Mine (for the Geita area); while studies in Tarime with sites to be provided by North Mara Gold Mine was delayed. The project conducted an evaluation of a number of ASM sites in order to identify a site with a resource that could be developed into a small-scale mine. In total six sites with PMLs (four in Kaseme and two in Rwamugasa) were evaluated for their geological potential to meet requirements for the development of a small-scale mine. A site was then identified within the PML owned by the Rwamgasa village government, for which a detailed "project plan" was prepared to meet the objectives of the MSPI and is now at the development stage. Under the partnership, Anglo-Gold Ashanti will offer its technical expertise to the village cooperative and contribute USD 160,000 to the project.[5]

5.6 ASM information portal

In April 2015 STAMICO established a small-scale mining portal where different mining-related information could be accessed, including information about STAMICO, the Small-Scale Mining Department, small-scale mining databases (equipment inventory), news about the small-scale mining sector, links to other ASM stakeholder websites, and online registration forms for small-scale miners and mineral dealers. A challenge identified by STAMICO officials on the use of the portal is that most dealers and ASM operators had not yet been trained on how to use it. Only 23 dealers and miners in Mwanza and six dealers in Dar es Salaam were provided with initial training.

5.7 Government provision of grants to ASM

One of the major challenges facing ASM is the lack of access to finance. Through the SMMRP, financed by the World Bank, the government established a programme for providing grants to identified ASM projects. The scheme is administered by the MEM through the Tanzania Investment Bank and requires mineral rights owners to prepare a business plan and submit it to the bank for consideration. The equivalent of USD 3 million

[5] http://www.worldbank.org/en/news/feature/2014/11/24/landmark-small-scale-mining-initiative-kicks-off-in-tanzania

was disbursed through this system in 2015/16 to a total of 111 ASM projects and USD 3.3m were planned for the 2016/17 financial year.[6] The grant is limited to a maximum of USD 50,000 per operator. While this initiative has helped more advanced ASM operations, the requirements are still too much of a hurdle for most, forcing them to hire consultants to submit the paper work, thereby reducing the amount left over for capital investment. The scheme has now been temporarily suspended by the government pending an audit to establish how the grants were being used.

5.8 Training for small-scale miners

The MEM under its ASM department has been facilitating training for ASM operators in areas such as health and safety and financial management. In October 2015, in Morogoro, 181 small-scale miners were trained on how to effectively use the grants offered by the government and how to keep records. In March 2016, 38 leaders of the ASM associations FEMATA, TAWOMA, Women in Mining Association (WIMA), Tanzania Salt Producers' Association (TASPA), and REMAs were also given training on the system for disseminating ASM-related information. In May 2017, the MEM conducted training on mining safety to small-scale gemstone miners in Mirerani, where the ministry officials including the Commissioner for Minerals and the Chief Mine Inspectors trained small-scale miners on safety in mining; the 2009 Mining Policy; the 2010 mining Act and its regulations; health and safety regulations in mining; proper use and storage of explosives; and environmental protection in small-scale mining. In addition, there has been training on value addition: on 19 May 2017, 18 women graduated from a training programme on mineral cutting and polishing, provided by the Tanzania Geology Centre in Arusha. From July 2016 to March 2017, the MEM has provided training to 6,000 small-scale miners in all mining zones within the country on small-scale mining, health and safety in mines, entrepreneurship and environmental protection. All training was implemented by mining officers from zonal and resident offices as part of their work (MEM, 2017).

5.9 Establishment of centres of excellence

Under the SMMRP project, the MM is also in the process of establishing seven centres of excellence for processing minerals. These centres will be located in Buhembe (Mara), D-reef and Kapanda (Mpanda), Itumbi (Chunya), Katente (Geita), Kyerwa (Kagera), Maweni (Tanga) and Masakasa/Mkwenyule (Kilwa). Establishing these centres will cost USD 8.4 million (equivalent to 19.41 billion Tanzanian shillings). These centres will be used by small-scale miners to process their minerals as well as to learn how to manage their mining operations sustainably (MEM, 2017).

[6] According to the Budget Speech of the Minister of Energy and Minerals that was read in parliament on 19th May 2016.

5.10 Grievance handling and dispute resolution

The MEM has undertaken various initiatives to resolve all pending mining disputes that were disrupting the development of the sector. Among the disputes resolved were longstanding disputes between ASM and exploration/mining companies at Mwabomba (Kahama), Ishokelahela (Misungwi), Samena (Geita), Shenda (Mbogwe), Kanegele (Mbogwe), Same, and Nambilanje (Ruangwa), which were resolved in 2014/2015. Fact-finding visits were also made to Shinyanga, Musoma, Mwanza, Arusha, Tanga, and Lindi where long-standing disputes were investigated, and the Commissioner for Minerals convened six dispute-hearing meetings in accordance with Section 102 of the Mining Act 2010 (MM, 2017).

6 Field study and engagement findings

This section presents the key findings from the field study conducted by MTL Consulting in March 2017 and the stakeholder engagement conducted by MTL, HakiMadini and IIED in May–June 2017. The findings are structured by thematic area and informed by the outcome of the ASM multi-stakeholder scoping workshop conducted by IIED in September 2016.

Stakeholders represented include: ASM operators at various levels, ASM regional associations, women miners' regional associations, ASM brokers, local governments, Ministry of Energy and Minerals (led by the Commissioner and his deputy), Geological Survey Tanzania (led by acting CEO), Chamber of Mines (CEO), Parliamentary Committee for Energy and Minerals (led by the Chairman), Mineral Resources Institute (led by the Principal and Deputy), CSOs, faith-based organisations, academia and the media.

6.1 ASM's value for livelihoods and potential for sustainable development

Employment contribution

ASM has been a source of employment for a significant proportion of the rural population. Those consulted during the research and stakeholder meetings confirmed that mining provides them with the finance to run their households. The research showed that 94 per cent of the 49 interviewees were permanently engaged in mining operations and service provision in the mining area, while the rest were temporarily engaged.

Promotion of socio-economic development in mining areas

In areas that have become mineral trading centres, eg, Maganzo in Shinyanga, Katoro and Geita Town in Geita, the significance of ASM is substantial. Most of the investments within the mining areas have come from ASM, with miners diversifying their economic activities and investing in other income-generating activities such as hotels. A good example is the Nsangano Gold Project, with the family that owns the project diversifying into hotels, agriculture and trading. This project has also been supporting the Nyarugusu community in health services by offering a free ambulance service for the community, which is also used in the mine site.

Revenue collection at the district and village level

ASM has the potential to contribute to district and local economies through revenues and tariffs. During focus group discussions (FGDs) with district authorities and village government authorities, the value of ASM in terms of revenue/tariffs collected was highlighted. For example, the Maere village government in Tanga collects 800,000 Tanzanian shillings (TZS) per year from each of the eight salt farms in the village. In Same district, FGDs with the District Executive Director (DED) and her management team indicated that the district expected to receive TZS 38,000,000 in revenue from gypsum and sand ASM operations for the 2016/2017 financial year, although only TZS 13,740,000 (36 per cent) had been collected as of March 2017. Participants cited difficulties in monitoring and collecting revenues from ASM as the main reason for the low revenues collected. It should be noted, however, that revenues collected by local governments are based on specific bye-laws that impose certain fees on ASM operations. The mineral revenues (licence fees, royalties, inspection fees and others) as stipulated in the regulations are collected by central government through the regional mining offices.

6.2 ASM formalisation: priority issues

Licensed miners using informal operators

During the field study it was found that most PML holders did not develop their areas, but instead leased them out to individuals who in turn hire teams (mostly informal) to mine and pay royalties to the licence holders. This undermines the formalisation process, as the legislation does not bind licence holders to invest in the operations. In such cases the informal operators hired by licensed mineral rights holders are often exploited during the sharing of production, with PML holders seeking higher earnings from non-formal operations. When a PML is issued it is the expectation of the government that the operation within that PML qualifies as a formal small-scale mining operation. This means it is operating within government systems, with records of workers, production, explosives handling, plans for environmental, health and safety management, and payments of

government revenues. By sub-leasing the area to other operators, its formality can be questioned.

Lack of awareness and enforcement of the law

The field study identified lack of awareness by the miners about their legal requirements and limited capacity of authorities to enforce the existing laws as key issues. The differences between surface rights and mineral rights, for example, are often not clearly understood by mineral discoverers. Most landowners believe that they do not need mineral rights to mine upon discovery of minerals on their properties. As such, many continue to operate informally. While the land legislation gives them the surface rights on their land, it does not entitle them to the minerals contained therein. Furthermore, other sectoral regulations that prohibit human activities in certain areas, for example environmental and water regulations that prohibit human activities within 60m of water sources, are not well understood by most ASM participants. Natural resource regulations that impose conditions for working in controlled areas, such as forest reserves, also come into conflict with informal mining activities. Of the 37 PML holders, miners, pit owners and business people interviewed, 38 per cent said their knowledge of mining laws was poor and 30 per cent said it was only satisfactory.

Weak institutions and lack of coordination between government agencies

Interview results pointed to poor linkages between MEM and NEMC, Tanzania Minerals Auditing Agency (TMAA, now defunct) and Tanzania Revenue Authority (TRA), GST and land use departments at the district level. ASM operators expressed their concern that, on several occasions, officials from district, natural resources, health and mines departments have visited mining areas and given instructions that conflict with the standing regulations of other government departments. The lack of coordination between different government agencies in the overall administration of the mining sector was also cited during consultations with local governments. At the district level, different sectoral experts for land, agriculture, natural resources and environment, complained about lack of consultations by mining officials when taking decisions that impacted on their jurisdictions.

Lack of local government involvement and mandate in mining

Local government authorities are not vested with enough authority to deal with mining issues. All mining issues are handled by ZMOs and RMOs that report directly to the Commissioner for Mineral Resources located in Dar es Salaam. Local government authorities were concerned that they do not receive mining information from mining offices, but are just consulted when a problem, like an accident in a mine, occurs. At the district level, the District Environmental Management Officers expressed their concerns

about the lack of information on implementation of EPPs that are managed by the MEM to control environmental impacts of ASM. Similarly, Land Officers at the district level complained about the lack of information and consultation when the Ministry allocates mineral rights on parcels of land that are already designated for other uses. At the village government level, there were complaints that the Ministry allocated PMLs on village land without informing them, and that people with PMLs start mining without seeking consent from landowners. As a result, village governments spend most of their time trying to resolve conflicts caused by the Ministry through issuance of licences.

High cost of acquiring PMLs

Although there is a legal framework for ASM that provides a procedure for the acquisition of PMLs, the majority still operate without licences. During FGDs with ASM miners, it was clear that some miners were discouraged by the high cost of acquiring a mining licence, which costs up to a million Tanzanian shillings for an area of 10 hectares. During interviews, mining offices (zonal and resident offices) revealed that the cost of acquiring PMLs includes an application fee of TZS 50,000, a processing fee of TZS 50,000 and annual rent of TZS 80,000 per hectare.

Limited areas for establishing mining activities

According to the field interviews, artisanal and small-scale miners have limited areas in which to establish their mining activities because much of the land with mineral deposits has already been occupied by LSM or kept idle by licence holders. For example, consultations with Geita District Council revealed that Geita had 514 licences, of which only 200 were active.

Lack of geological information

Lack of geological information has been identified as a serious challenge facing ASM in Tanzania. Fifty-two per cent of the interviewed artisanal and small-scale miners consider it to be the most critical constraint, while another 27 per cent said it was critical. Due to the lack of geological data, ASM operations are carried out on a trial and error basis. This leads many miners, who have applied, paid fees and been issued with PMLs, to abandon areas that they find to be barren. Many pits are therefore abandoned, which causes environmental damage. The frequent movement of ASM operators also poses challenges for the drive towards formalisation. Stakeholders also cited the lack of access to geological information as a critical constraint to gaining access to finance from financial institutions.

Lack of technological tools

ASM operators use traditional techniques and rudimentary equipment for mining and processing activities. For most new entrants, and those without any capital investment,

the common tools used for excavation and processing of mined materials include picks, shovels, hoes, chisels, ropes, hammers and buckets. As a result, this group has limited ability to mine hard rocks or pump water out of their pits, and they tend to abandon pits and move to other areas presumed to have shallow deposits. Limited access to mining technology and knowhow was considered a significant challenge by interviewees, with 61 per cent of interviewed ASM operators citing it as the most critical constraint to ASM development, and another 31 per cent considering it to be critical.

Business people in surrounding areas are often the source of informal funding and services and some exploit ASM operators. They often install equipment next to the mining areas to provide processing services to miners, and because of the finance provided miners are required to sell their production to these business people who determine the prices. Consulted miners called on the government to formalise these informal equipment-financing channels to reduce the exploitation they currently face.

Insufficient mining experts for extension services

ASM operators and government authorities highlighted that there were not enough mining experts within zonal and resident mining offices to cover the entire area of jurisdiction. It was also pointed out that there were no mining experts within the district authorities. This capacity constraint was blamed for the lack of awareness-raising campaigns to educate miners on technology, environmental, health and safety impacts and available markets. Respondents expressed their concern that this limited involvement of the district authorities in mining-related issues.

6.3 Health, safety and environment: priority issues

Environmental problems such as deforestation, abandoned pits, water pollution and dust

Environmental problems have been exacerbated by the informal nature of ASM operations. FGDs with local authorities revealed that these environmental problems have led to increased pressure on local government authorities to better monitor and enforce existing laws and regulations – a difficult task due to the informal, seasonal and mobile nature of ASM operations. While the pits are small and may not individually have a significant impact, cumulatively ASM regions present a major environmental and health concern. Site visits, particularly in the gold and gemstone areas, showed that forest resources are depleted as trees are cut down for logs for pit stabilisation. Mangrove forests are also depleted due to salt mining.

Water contamination results from leakages of heavy metals and chemicals such as cyanide from the processing areas. The use of explosives also contributes to contamination of surface and groundwater. The amalgamation of gold is often carried out in open surface areas and leads to mercury being disposed of directly into soils. As most of the mining areas are surrounded by major rivers and lakes that provide fish for neighbouring and downstream villages, these practices have also raised health concerns for people not directly involved in ASM.

Destruction of roads by heavy trucks in rural mining areas

Roads are a lifeline for rural communities and in some cases, depending on the minerals mined in the area (particularly gypsum and aggregates), heavy vehicles used for collection end up destroying the rural roads. During the FGDs, Makanya village government authorities expressed concerns about destruction of roads by trucks that collect gypsum from the area.

Health problems

Health problems identified during interviews with small-scale miners on the mine sites included tuberculosis, malaria and HIV/AIDS, and exposure to mercury vapour, which can be fatal. Underground drilling, ore loading, surface crushing and grinding are all processes that generate dust, which can lead to respiratory problems and lung disease.

PML owners do not have a system for conducting health examinations on miners who work in their sites. Health risks of mining are similar for both sexes but there are additional hazards for women miners, especially if they come into contact with chemicals that present a health risk to foetuses or breast-feeding infants. FGDs with Maere village government and salt miners in Tanga Region revealed that women involved in assembling salts from salt farms have had miscarriages. This led the village government authority to restrict access to the mine for pregnant women. In addition to the children working in the mining areas, many women carry their small children while working in the mining areas. With fragile bodies that have little resistance to the occupational diseases resulting from mining operations, children are at higher risk of contracting diseases.

According to small-scale miners interviewed, mercury and cyanide were being used in gold mining sites. Miners understood the effects of mercury but said there was no other option. As a signatory to the Minamata Convention (see Appendix C), which seeks to ban the production and use of mercury, Tanzania will need to find an alternative to mercury for gold recovery. ASM operators consulted were already aware of this issue and expressed concern that without an alternative to mercury most of them would be put out of business. A number of alternatives to mercury have been tried but with mixed results.

Mining-related accidents are common in Tanzania. Small-scale miners consulted reported that they had experienced mining-related accidents within their sites: 79 per cent of

respondents said they had had one accident within a five-year period; 14 per cent had had two accidents; and 7 per cent of respondents had had four accidents.

Limited resources for health, safety and the environment in RMOs and district offices

RMOs and district councils have few experts to undertake effective health and safety monitoring and enforcement. As such, it is difficult for the available experts to cover their entire area of jurisdiction. Resident mines office staff reported that mining offices had geologists and mining engineers, but lacked environmental technicians. Thus, inspections are mostly carried out from an engineering perspective. District authorities also lack mining experts and the authority to enforce laws; in most cases there is only one environmental officer, who may not have mining knowledge.

Poor management of mining processes and lack of mine closure plans

The 2010 Mining Act does not require PML owners to prepare mine closure plans but requires them to prepare EPPs within four months of receiving their licence. The field study found that more than 90 per cent of the PML owners did not have an EPP and lacked knowledge about it. Although EPP is a legal requirement, the failure of ASM miners to backfill and rehabilitate the areas at the end of a mining operation can be associated with poor enforcement. Due to the mobile nature of ASM activities, ASM operators tend not to prioritise protecting the environment.

Lack of personal protective equipment (PPE) and lax enforcement

Observation during the field visit revealed that most ASM operations do not have PPE for their workers who are exposed to occupational diseases and injuries. ASM involves processes and equipment that can expose miners and nearby communities to noise and vibrations resulting from blasting in mining areas. Ore processing using generator-powered grinding machines can involve substantial exposure to noise, while hand processing using mortar and pestle is likely to produce lower levels. A field visit in the village of Mafuriko Amboni showed that noise and vibrations were normally heard due to blasting in aggregate and limestone mines, which are very close to the village.

Destruction of historical sites in mining areas

Some of the mining centres are located near historical sites; for example, FGDs with the village government authority at Mafuriko Amboni village identified that limestone and aggregate mining is conducted near the Amboni natural caves. As mining activities increase, these caves are under threat because they are made of limestone. They were

concerned that mining activities would destroy the caves in the future and thus damage the tourism industry in the area.

6.4 Women in ASM: priority issues

Traditional barriers

Some of the interviewed miners mentioned the cultural belief that women bring bad luck, and cause minerals to disappear. Thus, in some areas they are not allowed to enter the mining centres. Family responsibilities like taking care of children were also cited as limiting women's participation in mining activities.

Where PMLs are owned by women the activities in the pits are controlled by men

Due to the physical nature of mining activities, some women have had to engage men to assist them in their mining operations and management. For example, women's mining associations like HEKIMA SACCOS and Women's SACCOS in Geita had to engage men as members to help them to manage mining activities. Women miners who were interviewed were concerned that engaging men could result in cheating, sabotage and sexual harassment.

Limited access to financial credit

While lack of access to finance is a general ASM challenge, women in particular face challenges as they seldom own the land and licences that are normally used as collateral. In some cases, women are formally restricted from accessing loans, as customary practices require consent from a spouse or male relative. Similar issues were highlighted in interviews with women miners in the sites visited, and by women miners' associations. Furthermore, even some women with PMLs cannot access credit from financial institutions using their licences as these institutions demand more than PML as collateral. Most women in gold mining tend not to mine but just collect minerals in abandoned waste. This is partly due to lack of capital for investment.

Discrimination in allocations of mineral rights

ASM women who were interviewed claimed that they had been discriminated against in allocation of mineral rights, and that no land had been allocated specifically for women miners. An interview with the acting director of Tanga city, however, revealed that the regional authority had allocated land for women miners, setting aside 10 plots of land for women out of the 20 allocated for ASM miners.

6.5 Interface between ASM and LSM: priority issues

Conflict over the use of land resources

Some of the artisanal and small-scale miners interviewed believe that the government favours LSM, granting more land for LSM than ASM. According to the Tanzania Mining Act, 2010, traditional ASM rights to land do not entitle one to mineral rights and this benefits large, organised mining operations. Lack of knowledge about the legal requirements for obtaining mineral rights means that LSM companies are granted legal entitlements and traditional miners are evicted from the land they used to mine. It was also claimed that LSM possesses large areas of land, but they only operate on a small part of it.

Of 12 small-scale miners who reported experiencing land evictions, 92 per cent responded that they had been evicted once in a five-year period, and 8 per cent said they had been evicted three times within a five-year period. All of those who said they experienced eviction are from gold mining areas. Some also claimed that mining and exploration companies used ASM miners as unpaid 'geologists', for exploring areas.

Overlapping of mining licences

Some of those interviewed reported that there were occasional cases of mining licences overlapping, which creates conflict. Interviewed PML owners considered this to be the fault of the mining offices. Site visits and observations found only one case of licence overlapping.

6.6 Business case for ASM and operational scale-up/mechanisation: priority issues

The field study and consultations with stakeholders showed that ASM participants are still facing major hurdles with access to finance, markets, technology and technical mining knowledge, and mining land. Even where land has been set aside by the government for ASM use, the limited geological expertise, lack of funds to invest in exploration and limited support services mean that most of them work by trial and error, which is costly and inefficient and often results in the land being abandoned.

Difficulty in accessing credit

Stakeholders consulted during the research and stakeholder meetings identified this as a major factor limiting ASM potential. Of 49 interviewees who were asked about difficulty in accessing credit, 90 per cent said that it was the most critical constraint, 8 per cent said

it was critical and only 2 per cent did not consider it critical. The main reason given for the failure to access financial credit was lack of collateral and limited knowledge among miners about how to deal with financial institutions.

Consultation with financial institutions found that mining was seen as a risky activity with unpredictable cash flow although the level of risk varies according to the type of minerals mined. For example, financial risk in aggregate and salt mining cannot be compared to that of gemstone mining. This and the lack of alternative businesses that small-scale miners could offer as collateral makes it difficult for financial institutions to provide credit. Most of the financial institutions also have limited knowledge of mining and a negative perception of ASM.

Poor access to and information on markets

Limited access to markets was identified by most ASM participants as a major constraint to their business success. Trading in all the minerals produced by ASM (gold, diamonds, gemstones, and industrial minerals) was being done through middlemen or brokers, most of whom are not licensed and dictate prices. Reliable and affordable internet access is an issue for miners. Fifty-five per cent of interviewed small-scale miners identified the lack of market information and access as the most critical constraint for the ASM development, with 31 per cent considering it critical.

Lack of access to and understanding of government grants

The government has been providing credit and grants to small-scale miners, but these grants are difficult to access because there are many technical requirements that they are unable to fulfil. Consultations with MEM revealed that the criteria for accessing some government grants included: a valid licence approved by the Commissioner for Oaths; copies of the certificate of registration of a company or association, and its constitution certified by Commissioner for Oaths; copies of receipts for payment of the annual government fees, royalties, Taxpayer Identification Number (TIN) and taxes within the preceding six months; environmental management plan approved by the ZMO; and quarterly report of production for the preceding six months.[7]

Tax burden to ASM operators

There are various taxes and fees that ASM miners have to pay to the government authorities, such as annual rent, royalties, clearance fees, gold export levies, and to the district and village authorities. Interviewed small-scale miners see these as excessive. Thirty-three per cent of the interviewed artisanal and small-scale miners considered taxes

[7] Other requirements include at least two years' experience in operations; the existence of production activities in a project; a plan that meets the level of grant requested; and measurable indicators of sustainability without disruption to or relocation of communities (MEM, 2017).

as the most critical constraint to ASM development, 47 per cent said it was a critical constraint while 20 per cent disagreed.

Lack of guide price for minerals

Guide prices can be set for some minerals like aggregates, limestone and gypsum but it is difficult to set a guide price for minerals like gold as they are controlled by the world market. In a focus group discussion, gypsum miners in Makanya village identified lack of a guide price for the gypsum they produce as a major challenge, despite their various initiatives including consulting government authorities. It was claimed that in some cases (eg, aggregate mining in Amboni Tanga) the RMOs had taken the initiative to set up a guide price for the mined mineral, but miners themselves have been lowering the price to be more competitive.

6.7 Inclusive decision making for responsible and sustainable ASM: priority issues

Lack of space for ASM voices

Small-scale miners interviewed expressed concern at the lack of opportunities to express their opinions to government authorities. They claim that whenever they get a chance to meet with government authorities, their voices are not heard as they are silenced by regional or district authorities. Negative perceptions by some government officials about small-scale miners further discourages miners from expressing their opinions.

Dysfunctional REMAs

Some of the interviewed artisanal and small-scale miners voiced their concern that, although these regional mining associations were established with the intention of representing the interest of all artisanal and small-scale miners, they have been controlled by some of the successful small-scale miners, who use them for their own benefit.

Mining associations and SACCOS lack capital and management skills

Interviews with leaders of miners' SACCOS revealed that they lack capital and most have no knowledge of running the organisations. These associations depend on members' contributions to survive, but respondents claim that most members do not contribute to these associations. These challenges prevent any meaningful participation by miners in decision making. Out of 38 interviewees, 42 per cent responded that there is a benefit in being in an association while 58 per cent disagreed.

Miner demonstrating use of retort to minimise mercury pollution, Geita, Tanzania (IIED/Steve Aanu)

7 Potential solutions put forward by ASM stakeholders

The field study and stakeholder engagements not only sought input on key ASM challenges but also sought suggestions and recommendations that could serve as a basis for a solutions-focused Tanzanian dialogue.

7.1 ASM formalisation

Make online licensing system user-friendly: The MM, through the RMOs, should provide training on the use of the online licensing system so that more applicants can use it. The language used should be Swahili, as it is widely used and understood by the majority.

The MM should consider surface rights before granting PMLs: The 2010 Mining Act needs to be reconciled with the 1999 Land Act and the 1999 Village Land Act. The licensing authority should consult local governments and obtain information on the existing surface rights prior to allocation of the mineral rights.

The village government should be involved in granting PMLs: Village governments felt that the MM should involve them in the allocation of mineral rights in their areas given their close links with and knowledge of their respective areas. Their involvement will help them to enforce laws and regulations on mining activities within their villages.

Instituting an ASM day: ASM participants in the focus group discussions expressed their wish to have an annual day for small-scale miners, similar to the existing workers' day (1st May) and farmers' day (7th June) in Tanzania. This would bring them together and provide opportunities for miners to find new markets, technology and investment opportunities.

Training in financial management: Training in financial management is essential to ensure that the grants awarded to ASM are put to good use.

Training in minerals trading: The sector's potential could be better realised by making good use of institutions such as the mining institute in Dodoma, which could provide training to ASM on different aspects of mining and minerals trading.

Land allocation for ASM: It was proposed that the MM should work closely with the lands department at the district level through which they could exchange geological maps following exploration by GST and/or STAMICO, which would then be used for land use planning by the land departments and the village governments.

Establish a central point where all mining-related information can be obtained: A one-stop-centre should be established to store and provide information to miners on all mining-related issues including technology, mineral markets, mineral prices, funding sources, equipment and tools suppliers.

Encourage ASM to work in groups: Working through cooperatives or SACCOS could demonstrate security to lenders. The Chairman of the Rwamgasa Umoja SACCOS in Geita said that organising themselves together had helped them to attract investors and buy equipment.

Clearly identify and publicise role of each stakeholder in the formalisation process: All key ASM stakeholders including government, NGOs, FEMATA, REMAs and miners should have their roles in the formalisation process clearly identified, taking ownership of the process.

7.2 Health, safety and the environment

Empower the mining regional offices with human and financial resources and working tools: The government's decentralised system resulted in new regional mining offices, which could benefit from personnel and financial capacity to cover all mining areas within their jurisdictions.

Harmonisation between NEMC and MM regional offices: These should work together in improving environmental management and monitoring and providing support to ASM. Regional mine offices should be involved in any environmental inspections conducted by NEMC.

Active role for district environmental offices: As provided by the environmental legislation on overseeing ASM environmental management. This will be more effective if there is good coordination between the NEMC, environmental departments at the district level and mining offices.

Enhanced role for local governments in mining affairs: The role of local government in ASM administration should be defined and encouraged, and should include environmental monitoring as well as revenue collection. Local governments should be empowered through training on mining laws and regulations.

Make filling of abandoned pits a requirement for licence renewal: Abandoned pits should be refilled by using soil from new pits, followed by reforestation and monitoring.

Innovative management of dust pollution: Air pollution as a result of dust should be managed through such mechanisms as curtains in the wind zone to prevent dust from reaching animals and people.

Education for ASM operators and government authorities: Education is important in creating awareness of health and safety hazards (eg, mercury) and minimising the environmental impacts of ASM.

Increase resident environmental officers at ward/site level: To avoid environmental problems on ASM sites, environmental officers should be recruited at ward level.

Restrict chemical usage and introduce new technologies: Use of mercury and cyanide should be monitored and reduced. Simple and practical technology on water use should be introduced, and smelting/heating of gold by using the retort process should be encouraged. Gold washing with mercury should be done in banded[8] areas with the water recycling systems located outside residential areas.

7.3 Women in ASM

Gender policy reform: Consulted stakeholders were of the view that the national laws and policies must be gender sensitive and thus empower and allow women to own land, mining licences and practically engage in the mining sector without any form of discrimination or social exclusion. The key policies that need reform are the Land Policy, Land Act no. 5 of 1999, the Village Land Act no. 14 of 1999, Mining Policy and Mining Act of 2010. This can be achieved when zonal and national women miners' associations such as TAWOMA, KIWAMITA, FEMATA and other related CSOs engage more with policymakers such as members of parliament, responsible ministries, parliamentary committees and the Attorney General. Advocacy and engagement with policy makers should focus on discouraging the existence of customary law alongside statutory laws.

Education and awareness-raising to empower women: Education to help women understand the mineral sector and manage their mining operations will help them to prosper. Skills and knowledge on entrepreneurship, investment and diversification into non-mining sectors would enhance women's roles in the community by promoting local content. This could be done through NEEC, and forming partnerships with learning and vocational training institutions such as VETA. Advocacy to disentangle customary laws from formal laws, and reform the existing laws that undermine women in ASM, should be carried out through media campaigns.

Financial services for women: Women can be empowered by promoting gendered access to financial services that are affordable, practical and do not require lots of bureaucracy. Such services can only be provided by a special financial support programme initiated by cooperative banks or by a special financial institution set up for the purpose of working with women miners.

Organisation of women in groups: Women in ASM who organise themselves in groups work better. For example, MUWAKO succeeded in acquiring a licence and was given the opportunity to receive training on entrepreneurship to diversify its economic activities.

[8] An area with a cement floor with a concrete wall around it to limit outflow of contaminants

Transparent and gender sensitive allocation of mineral rights: Allocation of mineral rights to ASM should be transparent and women should be given favourable treatment as they have been left behind due to cultural reasons. Consulted stakeholders emphasised the need for government, through the Ministry of Lands, Housing and Human Settlement, MEM, the Mineral Commission and the licensing agencies, to enable women in ASM to own both land/mining blocks and licences for production.

Establish and empower organisations to support women: Women have an opportunity to access soft loans from women's organisations. Geita Women's Mining Association and SACCOS provide soft loans to women miners through an agreed share of production dividends. There are also organisations within the mining centres that assist women in land issues. In Geita District, Plan International is the main NGO dealing with land issues for women. Interviewees also pointed to the need for deliberate measures by the Minerals Commission to increase female representation in the councils both at regional and national level. The Commission can do this in collaboration with regional and zonal women associations. At the same time, women in ASM should become proactive in pushing for leadership positions within and through their different associations. These efforts should be replicated in sectors that complement the ASM and mining sector in general.

7.4 Interface between ASM, LSM and other land uses

Land allocation for ASM: Government provision of specific areas for ASM, as set out in the Mining Act 2010, can help promote peaceful coexistence between ASM, LSM and other land uses. Through GST, these areas should be surveyed to establish geological data that can be provided to ASM to aid their mining projects. Having geological information can assist a miner to access financial credits from financial institutions.

Develop land use plans in all areas with mining activities: Demarcating areas for crop cultivation, livestock keeping, living and mining can assist in avoiding conflict over land uses. According to FGDs with Karalani village leaders and gemstone miners, the village developed a village land use plan that helped to avoid conflicts over land uses. The Village Land Act 1999 advocates for all villages to develop land use plans; however, this has become difficult for the majority of villages due to budgetary constraints.

Regular consultations between ASM and LSM: Coordinated through the village (or district) governments, regular meetings between ASM and LSM will assist in identifying existing relationship challenges and facilitating peaceful co-existence.

Education and awareness campaigns: These are needed on different aspects, including the law and licensing procedures, to foster better understanding of regulatory enforcement and the role of government in managing LSM and ASM. They may include the importance of undertaking legal mining, the need to observe environmental protection laws, proper land use through understanding the Land Act, combating child labour and many other legal requirements for upholding human rights.

7.5 Business case for ASM and operational scale-up / mechanisation

- The government, through the ASM Unit, should establish a procedure for providing miners with minerals guiding prices;
- Reduce the number of conditions required to access government grants for ASM;
- Provide training to enable access to government grants;
- Government should work with banks to enable them to provide miners with low interest loans;
- Provide financial institutions with knowledge on ASM; this will help them in assessing risk;
- Provide loans to small-scale miners instead of grants. Loans will make them more accountable as they know that they will have to pay them back;
- Set up mineral buying centres on each mine site and these should be used by legal brokers only;
- Provide geological information to ASM operators; GST and STAMICO should carry out drilling in areas allocated to ASM and provide guidance;
- Establish centres for mining equipment in mining areas through which ASM can lease and/or buy the required equipment;
- Provide awareness campaigns and training for ASM on the required technologies;
- Organise mineral auctions, like those for tanzanite, in other areas to enable miners to access markets directly. This will also provide an opportunity for ASM operators to share experiences and learn from each other.

7.6 Inclusive decision making for responsible and sustainable ASM

Training and awareness campaigns: These should be provided to miners on most aspects of mining legislation, technology, and markets, among others. Through the Cooperatives Office at the district level, training should be provided to miners on the administration of SACCOS and cooperatives.

Support from government: Government leaders should provide miners with education and other support. The government should intervene and ensure the regional miners' associations represent all miners. Support should be provided to these associations to enable them to carry out their mandates.

Transparency from government: Government (RMO, MM) to liaise with other institutions and stakeholders to provide information to the public on mining matters, including the granting of PMLs.

More involvement of village government: Village government to be empowered in mining matters and leverage their proximity to the local mining community involving them in debates and decision-making.

Participants at national ASM dialogue, Geita, Tanzania (IIED/Steve Aanu)

8 Conclusion

In order for national initiatives to succeed, intervention programmes need to be well informed by key stakeholders. The IIED global ASM dialogue programme is designed to help national stakeholders identify solutions to promote a more responsible, rights-based and sustainable mining sector. The extensive stakeholder research, mapping and consultation process conducted in advance of the national dialogue in Tanzania has been presented here, with a detailed and extensive review of the ASM sector. Through a highly participatory process, stakeholders involved in Tanzania's mining of gold, gemstones and building materials identified not only the challenges currently being faced, but also potential solutions that build on the existing frameworks, and many of which are highly feasible.

The government of Tanzania has already taken considerable steps towards formalising the ASM sector, recognising its value to national and local economies. Bringing more ASM operators within the legal framework governing the sector will help generate additional revenue and mitigate the ongoing health, safety and environmental concerns in ASM. The consultation has shown that a precondition for effective ASM formalisation is resolving issues about land use and rights vis-à-vis mineral rights. Mining rights are frequently allocated centrally without due consideration of local and district

stakeholders. The decentralisation of the mining sector administration may be a tool for guaranteeing representation of the sector in the local development plans of respective mining areas. Clarifying the distinction between surface rights and mineral rights, and the environmental obligations associated with each, is essential through a reconciliation of the Mining Act, the Land Act and other relevant legislation.

The importance of better geological data was repeatedly emphasised during the stakeholder engagement process: essential for reducing the number of abandoned pits, expanding the areas available for ASM, and for resolving persistent conflict between large and small-scale miners. At the same time, the need for a better overall information base on ASM was highlighted: information on licensing obligations and responsibilities; technological, financial and health and safety information; information related to marketing and indicative prices for minerals; and information on business development, equipment supplies and alternatives to the usage of mercury and cyanide.

The secondary research into ongoing government and partner agencies' initiatives in ASM in Tanzania illustrated both successes and failures. It is clear that women miners and their specific needs must be embedded into policy and practice to ensure that they have equal rights to land, credit and infrastructure support. Also important is the need for transparency across the sector in terms of fiscal management, the granting of licences and cooperation between agencies. Formalisation could help maximise the potential of ASM once the illegality loopholes are closed.

The stakeholder engagement process and the overall review of ASM in Tanzania that is provided here represented a valuable body of information and was used as a basis for thematic dialogues and the national ASM dialogue conducted by IIED in collaboration with local partners. Key policy and practice issues that this research helped generate have been extracted in the form of roadmap elements and can be viewed in a forthcoming dialogue report. Some of the limitations of this research relate to the lack of up-to-date, comprehensive, and in-depth statistical data on the Tanzanian ASM sector. While the research covered as much of the key mining areas and stakeholders as possible with the given resources, future research should bring to light more ASM stakeholders' views with greater coverage.

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Appendices

Appendix A: Key informant interviews and meetings conducted

Date	Stakeholder/institution	Venue	Number of participants
Team One (covering Dar es Salaam, Tanga and Same)			
21/4/2017	Tanga City Council (Ag. City Director and his management team)	Council's office	4
	Tanga District Council (Administrative officer)	DC's office	1
	Mineral value addition LTD	MTL Consulting office, Dar es Salaam	1
24/4/2017	Maere Mtaa government leaders (Mtaa Executive Officer and Mtaa chairman)	Maere Mtaa government office	2
28/4/2017	Resident Mine Office – Kilimanjaro	RMO's office – Moshi, Kilimanjaro	1
	Same District Council – Administrative officer	DC's office – Same	1
	Same District Council – District Executive Director and the District Environmental Management Officer	DED's office – Same	2
10/5/2017	Tanzania Minerals Auditing Agency (TMAA)	TMAA's office – Dar es Salaam	3
26/5/2017	UN Women Tanzania	UN offices, Dar es Salaam	1
5/6/2017	Occupational Safety and Health authority (OSHA)	OSHA's office – Dar es Salaam	1
8/6/2017	National Bank of Commerce (NBC)	NBC headquarter, Dar es Salaam	1
9/6/2017	TIB Development Bank	TIB, headquarter, Dar es Salaam	3
14/6/2017	MEM, Sustainable Management of Mineral Resources Project (SMMRP)	SMMRP's office, Dar es Salaam	1
15/6/2017	NMB		2

Date	Stakeholder/institution	Venue	Number of participants
Team Two (covering Geita and Shinyanga)			
25/4/2017	Geita District Council – District Commissioner	DC's office – Geita	1
	Anglo Gold Ashanti – Geita Gold Mine (GGM)	GGM, Geita	1
27/4/2017	Gold miners in Nyarugusu (PML owners)	Mining sites	3
28/4/2017	Geita Resident Mine Officer	RMO office – Geita	1
2/5/2017	Shinyanga Region – Regional Commissioner and the Regional Administrative Secretary	Regional office – Shinyanga	2
	Zone Mining Office – Assistant Commissioner for minerals	ZMO office – Shinyanga	1
2/5/2017	PetraDiamond – Mwadui Diamond mine	Community Relations Manager	1
3/5/2017	Kishapu District Council – District commissioner and District Administrative secretary	DC's office- Kishapu	2
	Kishapu District Council – District Executive Director and his team of experts	DC's office	3
3/5/2017	NEMC – Lake Zone office – Mwanza	NEMC– Mwanza office	1

Appendix B: Focus group discussions conducted

Date	Stakeholder/institution	Venue	Number of participants
Team One (covering Dar es Salaam, Tanga and Same)			
10/4/2017	Ministry of Minerals (MEM)	MEM's office in Dar es Salaam	4
20/4/2017	Ag. Commissioner for minerals	RMO office in Tanga	5
	Assistant commissioner – Eastern Zone		
	Resident mine office (RMO) – Tanga		
21/4/2017	Tanga City Council (Ag. City Director and his management team)	Council's office	4
	Limestone and aggregate miners of Mafuriko Amboni village	Mafuriko Amboni meeting arena	13
22/4/2017	Kalalani village leaders, TAREMA and gemstone miners	Kalalani village government office	16
29/4/2017	Makanya village – Village government leaders and Gypsum miners	Makanya village government office	22
9/6/2017	State Mining Cooperation (STAMICO)	STAMICO's office, Dar es Salaam	9
Team Two (covering Geita and Shinyanga)			
20/4/2017	Geita Regional Miners' Association (GEREMA)	GEREMA's office – Lwamgasa village	5
25/4/2017	Geita District Council – District Executive Director and his team of management	DED's office – Geita	14
26/4/2017	Lwamgasa village government council	Lwamgasa village government office	15
28/4/2017	HEKIMA SACOSS	Lwamgasa	7
29/4/2017	Nyarugusu Ziwani Village government council	Village government office	18
1/5/2017	Maganzo village government council	Village government office	16
	Diamond miners in Maganzo village	Maganzo village	15
2/5/2015	Maganzo Small Scale Miners Association (MSMA)	Maganzo	5

Appendix C: International treaties, conventions and protocols relevant to ASM in Tanzania

The Minamata Convention on Mercury

This is an international treaty which was approved by delegates representing nearly 140 countries on 19 January 2013 in Geneva with the objective of "protecting human health and the environment from anthropogenic emissions and releases of mercury and mercury compounds". The convention was adopted and signed at a diplomatic conference held in Kumamoto, Japan on 10th October 2013. In support of its objective, the Convention has provisions that relate to the entire life cycle of mercury, including controls and reductions across a range of products, processes and industries where mercury is used, released or emitted. The treaty also addresses the direct mining of mercury, its export and import, its safe storage and its disposal.

In summary, the convention requires signatory countries to[9]:

- Reduce and where feasible eliminate the use and release of mercury from ASM
- Control mercury air emissions from coal-fired power plants, coal-fired industrial boilers, certain non-ferrous metals production operations, waste incineration and cement production
- Phase out or take measures to reduce mercury use in certain products such as batteries, switches, lights, cosmetics, pesticides and measuring devices, and create initiatives to reduce the use of mercury in dental amalgam
- Phase out or reduce the use of mercury in manufacturing processes such as chlor-alkali production, vinyl chloride monomer production, and acetaldehyde production
- In addition, the Convention addresses the supply and trade of mercury; safer storage and disposal, and strategies to address contaminated sites.
- The Convention includes provisions for technical assistance, information exchange, public awareness, and research and monitoring. It also requires Parties to report on measures taken to implement certain provisions. The Convention will be periodically evaluated to assess its effectiveness at meeting its objective of protecting human health and the environment from mercury pollution.

Tanzania signed the Minamata convention on Mercury on 10 October 2013 but has yet to ratify it. However, the convention obtained the required 50 ratification parties on 5 May 2017. As such, the Convention became binding to all its parties on 16 August 2017.

[9] www.epa.gov/international-cooperation/minamata-convention-mercury

The United Nations Framework Convention on Climatic Change (1992)

The objective of the United Nations Framework Convention on Climatic Change (UNFCCC) is to stabilise the concentration of greenhouse gases (GHGs) in the atmosphere, at a level that allows ecosystems to adapt naturally and protects food production and economic development. Article 4 commits parties to develop, periodically update, publish and make available national inventories of anthropogenic emissions of all GHGs not controlled by the Montreal Protocol (by source) and inventories of their removal by sinks, using agreed methodologies. It commits parties to mitigate GHGs as far as practicable. Since ASM operations are likely to be one of the sources of GHGs, this convention is applicable.

Other ASM relevant international conventions ratified by Tanzania include: -

- ILO Convention, C138 Minimum Age Convention, 1973 (ratified by Tanzania (United Republic of) on 16:12:1998) which prohibits child labour;
- ILO Convention, C182 Worst Forms of Child Labour Convention, 1999 (ratified by Tanzania (United Republic of) on 12:09:2001). Therefore, in accordance with these Convention requirements, ASM will have to adhere to the ILO Convention, particularly in child labour employment. ASM operators must ensure that no child labour is practised throughout the project's life cycle;
- ILO Convention, C148 Working Environment (Air Pollution, Noise and Vibration) Convention, 1977 (ratified by Tanzania (United Republic of) on 30:05:1983) which protects workers against occupational hazards in the working environment due to air pollution, noise and vibration. ASM must ensure that workers are protected against occupational hazards.

Knowledge Products

Research Report

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Sustainable markets

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Artisanal and small-scale mining (ASM) is increasingly important for the development of Tanzania's economy, with an estimated one million people directly employed in ASM and many more dependent on it for their livelihood. Tanzania's government has taken steps to improve and formalise the sector but small-scale miners still face many challenges, including difficulty in obtaining mining land and licences; inadequate support to improve skills and protection of the environment; limited access to tools and technology; and difficulty in accessing markets.

In 2017 IIED, in collaboration with Tanzanian partners MTL Consulting and HakiMadini, convened a multi-stakeholder dialogue process in Tanzania to help national stakeholders to identify solutions to promote formalised, rights-based, productive ASM within a more inclusive and responsible mining sector. This report presents the findings of research carried out to inform this dialogue. The research is based on a desk study, stakeholder mapping, and stakeholder engagement using interviews, focus group discussions and site visits. Stakeholders consulted include mining communities, ASM associations, including women's groups, service providers, civil society organisations, government agencies at regional, district and village level, media and academia.

This research provides an insight into the potential and positive impacts of ASM as well as highlighting the existing challenges facing the sector. Stakeholders consulted proposed a number of solutions for overcoming ASM challenges. As a result of the national dialogue and this research, a roadmap for reform of the ASM sector in Tanzania has been drafted, and a 'learning and leadership' group of ASM representatives has been formed to refine and take this roadmap forward.

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