

# The new face of informality in the Tanzanian mineral economy: Transforming artisanal mining through foreign investment?

George Schoneveld, Maisory Chacha, Maria Njau, Jesper Jønsson, Paolo Omar Cerutti and Xiaoxue Weng



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Cover photo: Fortunatus Waziri, a driller, works deep within a tunnel at the Nsanganu Gold Mine, Mawemeru village in Geita District, Tanzania on March 15, 2015. Fortunatus is an orphan and is recently divorced. His only child lives with his grandmother, and he sends them money earned in the mine whenever possible. Credit: Brian Sokol/Panos Pictures

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# Executive summary

Artisanal and small-scale mining (ASM) of precious metals and gemstones has long been a mainstay of Tanzania's rural economy, contributing to the livelihoods of more than three million Tanzanians. ASM is yet to realise its full development potential, however. The sub-sector continues to be characterised by informality and is beset by social, environmental and economic underperformance issues as a result of structural resource and capacity constraints. As in other countries such as Ghana, Cameroon and Zimbabwe, foreign investors, often of Chinese origin, are increasingly participating in Tanzania's ASM chains. Bringing in much-needed capital, technologies and know-how, such investments have the potential to contribute to resolving ASM barriers, improving performance through the upgrading of their production operations and formalisation, though they could also pose a threat if not properly regulated.

This paper aims to offer new insights into the opportunities and risks associated with leveraging foreign private capital in support of ASM development. It does this by examining (1) the nature and scope of investor participation in Tanzania's ASM, (2) how (well) this participation is regulated and (3) the attendant sustainable and sector development implications. Following extensive scoping activities, four sites were selected where both Chinese and other foreign investors are actively participating in ASM. Within these sites, we conducted 155 surveys with mine employees, 19 focus group discussions with community members and 89 key informant interviews with investors, government and other key stakeholders.

Our analysis reveals how investor participation in Tanzania's ASM sector has evolved in recent years – from arm's length trading relations to increased engagement in extraction and processing. We find that such investments have contributed to fulfilling the basic livelihood needs of rural populations. Yet, by taking over *de facto* ownership and management of the mines, replacing the traditional profits-sharing model with a wage structure and offering limited technical trainings, ASM-investor partnerships have by and large failed to fulfil their transformative potential for sector upgrading. We observed limited differences between Chinese and other investors in business models and associated impacts, attesting to the sector-wide – rather than investor-specific – nature of these challenges. In light of the ongoing sector reform, this paper highlights a host of critical institutional issues that deserve greater attention if the Tanzanian government is to improve the performance of ASM and leverage the potential of foreign investment in the sub-sector. These include ineffective incentive and accountability structures, weak cross-sectoral coordination, capacity constraints, and excessive centralisation of enforcement.

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# Acronyms

|          |                                                                                  |
|----------|----------------------------------------------------------------------------------|
| ASM      | Artisanal and small-scale mining                                                 |
| CIL/CIP  | Carbon-in-leach/carbon-in-pulp                                                   |
| CMA      | Commission for Mediation and Arbitration                                         |
| CSR      | Corporate social responsibilities                                                |
| DEMO     | District environmental management officer                                        |
| DED      | District executive director                                                      |
| EIA      | Environmental impact assessments                                                 |
| EMA      | Environmental Management Act                                                     |
| EMP      | Environmental management plan                                                    |
| EPP      | Environmental protection plan                                                    |
| FDI      | Foreign direct investment                                                        |
| KPI      | Key performance indicators                                                       |
| LSM      | Large-scale mining                                                               |
| LGA      | Local Government Authorities                                                     |
| MEM      | Ministry of Energy and Minerals                                                  |
| ML       | Mining licence                                                                   |
| MM       | Ministry of Minerals                                                             |
| MSM      | Medium-scale mining                                                              |
| MT       | Metric tonnes                                                                    |
| MRO      | Mines Resident Office                                                            |
| NEMC     | National Environment Management Council                                          |
| OHS      | Occupational health and safety                                                   |
| OSHA     | Occupational Safety and Health Authority                                         |
| PPE      | Personal protective equipment                                                    |
| PO-RALG  | President's Office Regional Administration and Local Government                  |
| PML      | Primary mining licences                                                          |
| PPL      | Primary prospecting licences                                                     |
| PMO-LYED | Prime Minister's Office, Labour, Youth, Employment and Persons with Disabilities |
| RMO      | Resident Mines Offices                                                           |

|         |                                |
|---------|--------------------------------|
| SAP     | Structural adjustment program  |
| SML     | Special mining licences        |
| STAMICO | State Mining Company           |
| TIC     | Tanzania Investment Centre     |
| TMAA    | Tanzania Minerals Audit Agency |
| TRA     | Tanzanian Revenue Authority    |
| TAC     | Technical Advisory Committees  |
| UK      | United Kingdom                 |
| URT     | United Republic of Tanzania    |
| VPO     | Vice President's Office        |
| ZMO     | Zonal Mines Offices            |

# 1

## Introduction

Artisanal and small-scale mining (ASM) of precious metals, especially gold, and gemstones has long been a mainstay of Tanzania's rural economy (Chachage 1995; Fischer *et al.* 2009), and many other countries in sub-Saharan Africa (Carstens and Hilson 2009). Although the contributions of the ASM sector to national mineral output, public revenues and foreign exchange earnings are paltry compared with Tanzania's modern and highly mechanised large-scale mines (LSM), the ASM sector directly employs an estimated 680,000 Tanzanians, as opposed to 8,800 by LSM (URT 2011). With every person directly involved in ASM estimated to generate four additional indirect employment opportunities, the ASM sector in Tanzania likely provides employment opportunities to nearly three million Tanzanians. It is the most lucrative off-farm income in many rural areas (Jønsson and Fold 2011).

Despite ASM's positive contributions to rural livelihoods, it has been widely criticised across Africa for its poor social and environmental performance. In Tanzania, studies have found widespread failure to adhere to health and safety standards (Hinton 2005), environmental degradation (Kitula 2006), the use of child labour (HRW 2013), social problems emanating from demographic shifts and income and employment insecurity (Bryceson and Jønsson 2010), land conflicts (Lange 2011; Carstens and Hilson 2009) and tax avoidance and smuggling (Fold *et al.* 2014). Although Tanzania's laws and regulations governing the mining sector and its impacts are comparatively well-developed, most ASM operations in the country operate informally, often outside the purview of the state (Fisher 2008). As many regulatory agencies lack the necessary resources and incentives to enforce sector regulations effectively, the ASM sector mostly escapes the consequences of its legal non-compliance (*ibid.*). Moreover, due to limited access to finance and modern production technologies and weak linkages to LSM, most ASM operations rely on rudimentary and unsustainable production practices, fail at developing the necessary mining infrastructure and show poor economic efficiency and recovery rates

(Hentschel *et al.* 2003; Hinton *et al.* 2003). While more rights have been afforded to ASM over recent decades, the Tanzanian ASM sector has yet to realise its full potential to be able to compete on equal footing with LSM (Pedersen *et al.* 2016).

In contrast to countries such as Ghana and Zimbabwe, Tanzania is yet to develop a dynamic medium-scale mining (MSM) sector to help bridge the ASM-LSM divide. Our research shows, however, that Tanzania in recent years has witnessed an influx of foreign-owned mining companies that are participating in ASM value chains. High costs and risks associated with establishing new mining operations and declining access to mining titles within proven mineral reserves have encouraged entrepreneurial investors to explore opportunities for operating ASM mines in lieu of establishing greenfield operations. This injection of much-needed capital and modern technologies into the ASM sector has the potential to contribute to resolving some of the social, environmental and economic performance challenges associated with the sector. By enhancing ASM access to the finance, technologies, knowledge and business networks, foreign investment can help upgrade and formalise operations.

The influx of foreign capital into ASM in much of Africa is a relatively recent phenomenon. Foreign capital flows to Africa's mining sector typically originated from large multinational mining companies (often benefitting from preferential policies and incentives), which have tended to conflict and compete with ASM rather than support its development (Jönsson and Fold 2011; Helliesen 2012; Yakovleva and Vazques-Brust 2018). In African countries where injection of foreign capital into ASM has been better documented, such as in Cameroon, Ghana, and Zimbabwe, it appears that capital flows largely originate from Chinese actors seeking to exploit inefficiencies and legal vacuums in ASM (German *et al.* 2011; Hilson *et al.* 2014; Weng *et al.* 2015). As ASM licences are typically reserved for citizens, and negative preconceptions about the intentions and conduct of Chinese investors are widespread, such capital flows have not been without controversy. Rather than being viewed as an opportunity for resolving ASM performance challenges, they are widely descried for their exploitative strategies, fuelling corruption, exacerbating illegality and conflict, and further entrenching socially and environmentally detrimental mining practices (Hilson *et al.* 2014; Weng *et al.* 2015). The China-in-Africa discourse is especially susceptible to hyperbole (Brautigam and Zhang 2013; Schoneveld 2014), however, and the antagonistic characterisation of Chinese investments contributes to discursive myopia and deflects attention from structural misgovernance issues that underlie sector underperformance (Hilson *et al.* 2014). Moreover, such characterisations also inhibit constructive and proactive dialogue around mechanisms to better leverage the development potential of private (Chinese and other) investment inflows into ASM.

In this context, research was undertaken between 2015 and 2017 in Tanzania's gold and copper sector to fill knowledge gaps about (1) the nature and scope of investor participation in Tanzania's ASM, (2) how (well) this participation is regulated and (3)

the attendant sustainable and sector development implications. Given the attention in both public and academic discourse on the role of Chinese actors in the ASM sector, where possible we sought to differentiate between different types of investors and explicitly target those production areas where both Chinese and non-Chinese investors are active in ASM. Our analysis reveals how investor participation in Tanzania's ASM sector has evolved in recent years and how such investments have by and large failed to fulfil their transformative potential in sector upgrading, though still providing tangible livelihood benefits to the rural populations. We highlight a number of critical institutional issues that deserve greater attention if government is to better capture the development opportunities emanating from rising investor interest in ASM chains. Given increased political commitment to domestic value creation in Tanzania's mining sector, there currently exists ample momentum and political space to explore alternative governance options that encourage stronger productive linkages between ASM and the rest of the mineral economy.

This paper is structured as follows: As background, the following section explores the history of Tanzania's mineral economy, the evolution of the rules governing the sector and mining's contribution to national development. Following an overview of the methodological approach and associated limitations, we present the results from our research activities. This is structured into three components: (1) value chain dynamics, (2) political economy of ASM, and (3) investment impacts. In the subsequent discussion, before concluding, we reflect on some structural challenges that demand greater attention going forward and the role that recent amendments to Tanzania's mining regulations may play in resolving those.

# 2

## Background

### 2.1 Evolution of Tanzania's mineral economy

Tanzania's mineral wealth became apparent in 1898 when a German mining company discovered large gold reserves within Northwestern Tanzania's greenstone belt in today's Geita region (Chachage 1995). With the onset of World War I, all commercial mining activities ceased, only to be re-established in the 1920s under the transition from German to British rule. The first major gold rush took place in 1922 in Lupa, Southwest Tanzania, in what is now the Mbeya region (Bryceson *et al.* 2014). While early sector development primarily involved European settlers, ASM mining began to emerge with the passing of the 1929 Mining Ordinance, which enabled Tanzanians to apply for mining and prospecting licences (*ibid.*). In 1938 there were an estimated 32,000 ASM miners in Tanzania, 73% of which worked around Lupa (Lemelle 1986). During this period, small-scale mining became prevalent in the southwest, with investments from the British administration focusing on the former German gold mines around what is today referred to as the Lake Victoria Gold Fields. But it was in the northwest of the country where many large commercial gold mines, and to a lesser extent diamonds, lead, mica, and salt mines, began to concentrate. By 1936, the Geita Mine had become the largest gold producing mine in East Africa (Roberts 1986).

The mining sector collapsed during World War II as a result of labour and supply shortages and struggled to re-establish itself in the war's aftermath (Chachage 1993). Only the Williamson Diamond Mine in Shinyanga region experienced rapid expansion during the 1950s. Soon after Tanzania's independence in 1961, ASM was discouraged – it was viewed as incompatible with a modern mining economy. In 1967, as Tanzania began to centralise economic planning and pursue indigenisation policies, the state acquired

majority shares in foreign-owned projects and restricted foreign property ownership (Bryceson *et al.* 2012). In 1972, the State Mining Company (STAMICO) was established to operate nationalised mines. But when Tanzania succumbed to structural adjustment program (SAP) reforms in 1987, mining legislation was gradually liberalised. This included privatisation of STAMICO mines and removal of restrictions on the buying and selling of minerals (Chachage 1993; Lange 2006). As part of broader economic reforms, the government enacted the National Investment Promotion and Protection Act in 1990, which prioritised mining investments and provided incentives and guarantees for mining investors (*ibid.*). These reforms restored investor confidence, leading to a rapid increase in foreign direct investment (FDI) in both mining and prospecting over the 1990s. By 1998, the mineral economy had attracted more than US\$2.5 billion of investment, especially in the gold sector in Northwestern Tanzania (Bryceson *et al.* 2012).

Due to low agricultural commodity prices and a changing government stance on ASM, many peasants began to embrace mining during the 1980s as a livelihood option in mineral-rich regions of the country as an alternative to agriculture (Bryceson *et al.* 2012). This resulted in a series of major gold and gemstone discoveries and a rapid expansion of ASM (Chachage 1993). During the SAP era in particular, the government began to appreciate the potential of the mining sector to promote broad-based growth. This led to the formulation of the Mining Policy in 1997 and the ratification of the Mining Act in 1998. While both the Policy and the Act were highly investor friendly, the government also sought to provide avenues for the more than 500,000 ASM miners at that time to be more productively integrated into the mineral economy and to formalise their claims (Fisher 2007). With the 1998 Mining Act, ASM miners were offered the same opportunities as large-scale investors to obtain prospecting and mining licences through claims referred to as Primary Prospecting Licences (PPL) and Primary Mining Licences (PML) (Jønsson and Fold 2009). The Act though did not differentiate between truly artisanal mining relying on rudimentary technologies and more modernised small-scale mining operations.

Mining authorities had a limited capacity to inform ASM miners about their legal rights and to process PML applications, however. Consequently, they favoured applications from exploration and mining companies tied to speculative investment rather than livelihood generation (Moody 2007; Jønsson and Fold 2014). This enabled larger investors, both foreign and locally owned, to secure claims over large areas that were mined by ASM operators. The ensuing conflict is ongoing and unresolved, and was one of the reasons behind the establishment of the Presidential Mining Review Committee in 2007 tasked with examining options to better integrate ASM into the mineral economy and capture domestic value from large-scale commercial mining. This ultimately resulted in a new Mining Policy in 2009 and a new Mining Act in 2010.

Key provisions of the 2010 Mining Act include (Jønsson and Fold 2014):

- Establishment of designated PML mining areas,
- Decentralisation of PML applications to Zonal offices,
- Extension of PML validity from 5 to 7 years (and abolishment of PPL),
- Reserving PML and gemstone mining for Tanzanian citizens or corporate bodies only,
- Confiscation of mining licences held for speculation,
- Awarding licences on a 'first come, first serve' basis in cases of conflicting claims,
- Buying and selling permits through dealer and brokering licences or export permits for commodities originating from licensed mines,
- Increasing royalty payments (calculated according to gross revenue instead of 'net back-value'), and
- Enabling government to acquire direct stakes in future mining projects.

Building on the 1998 Mining Act, the 2010 Mining Act provides for six types of licences that regulate mineral value chain activities. Table 1 summarises the rights, obligations and restrictions of the different types of licences. Broadly: Special Mining Licences (SML) are reserved for investments exceeding US\$100 million and are valid for the estimated life of the ore body, whereas Mining Licences (ML) are reserved for projects with capital investments between US\$100 thousand and US\$100 million and are valid for 10 years. PML licences are exclusively available for Tanzanians with investments not exceeding US\$100 thousand. A 2015 amendment to the Mining Act raised the 'initial capital investment' to US\$5 million for a PML (albeit with some confusion as to the definition of initial capital investment). Only those eligible for a PML (ie Tanzanian nationals) can obtain either broker or dealer licences to buy and sell minerals. Nevertheless, non-Tanzanians are permitted to obtain undivided participating shares not exceeding 75% in dealer licences. Brokers are not permitted to export however; this is reserved for dealers and PML, ML and SML holders. Non-residents are permitted to buy from registered dealers and mining licence holders when a Special Export Permit is obtained.



Table 1: Types of mineral licences

| Type of licence              | Rights                                                                                                                                                                                                                                              | Obligation and restrictions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Special Mining Licence (SML) | <ul style="list-style-type: none"> <li>• Exclusive right to extract licensed minerals for the estimated life of the ore body</li> <li>• Eligible for 'development agreement' with the government for obligation reductions or exemptions</li> </ul> | <ul style="list-style-type: none"> <li>• For capital investments exceeding US\$100 million</li> <li>• Foreign investors not permitted to mine gemstones without ministerial approval</li> <li>• Subject to the allocation of an Environmental Certificate through an Environmental Impact Assessment</li> <li>• Payment of royalties on gross value of production</li> <li>• Government has the right to have a free carried interest</li> <li>• Produce proof of technical and financial capacity</li> </ul> |
| Mining Licence (ML)          | <ul style="list-style-type: none"> <li>• Exclusive right to extract licensed minerals for no more than 10 years</li> </ul>                                                                                                                          | <ul style="list-style-type: none"> <li>• For capital investments between US\$100,000 and US\$100 million</li> <li>• Foreign investors not permitted to mine gemstones without ministerial approval</li> <li>• Subject to the allocation of an Environmental Certificate through an Environmental Impact Assessment</li> <li>• Payment of royalties on gross value of production</li> <li>• Produce annual procurement plans</li> </ul>                                                                        |
| Primary Mining Licence (PML) | <ul style="list-style-type: none"> <li>• Exclusive right to both mine and prospect within licensed area for 7 years (renewable)</li> <li>• Can upgrade to ML</li> </ul>                                                                             | <ul style="list-style-type: none"> <li>• Initial capital investment should not exceed US\$5 million</li> <li>• Area cannot be subject to other mineral rights, except for gemstone mining within areas licensed for prospecting</li> <li>• Subject to submission of an Environmental Protection Plan (EPP)</li> <li>• Only for individuals, partnerships and corporate bodies comprised exclusively of Tanzanians</li> </ul>                                                                                  |

| Type of licence     | Rights                                                                                                                                                                                                                         | Obligation and restrictions                                                                                                                                                                                                                       |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Prospecting Licence | <ul style="list-style-type: none"> <li>• Exclusive right to undertake exploration activities in designated area for 4 years (renewable for 3 years)</li> <li>• Right to sell gemstones uncovered during exploration</li> </ul> | <ul style="list-style-type: none"> <li>• Area cannot be subject to other mineral rights</li> <li>• Not more than 20 licences per investor if total area exceeds 2,000km<sup>2</sup></li> </ul>                                                    |
| Dealer Licence      | <ul style="list-style-type: none"> <li>• Right to buy and sell licensed minerals for 12 months (renewable)</li> <li>• Right to export minerals</li> </ul>                                                                      | <ul style="list-style-type: none"> <li>• Tanzanian individuals or corporate bodies need to own at least a 25% share and be qualified to obtain a PML</li> <li>• Pay royalties on behalf of miners</li> </ul>                                      |
| Broker Licence      | <ul style="list-style-type: none"> <li>• Right to buy and sell licensed minerals for 12 months (renewable)</li> </ul>                                                                                                          | <ul style="list-style-type: none"> <li>• Not permitted to export</li> <li>• Restricted to individuals or corporate bodies eligible for a PML</li> <li>• Can only sell to licensed dealers</li> <li>• Pay royalties on behalf of miners</li> </ul> |

A number of (especially institutional) amendments were made to sectoral legislation in 2017 following a controversial conflict over underreported grades of copper concentrates (and by implication royalty and tax avoidance). In June 2017, the government tabled three bills in the National Assembly, namely, the Written Laws (Miscellaneous Amendment) No. 4 of 2017 with amendments to the Mining Act of 2010; Natural Wealth and Resource Contracts (Review and Renegotiations of Unconscionable Terms) Bill 2017; and the Natural Wealth and Resources (Permanent Sovereignty) Bill 2017 (see Table 2 for an overview of relevant amendments). The bills were signed into law under a certificate of urgency less than a month later, affording minimal opportunity for consultation and debate. In October 2017, the 2016 Notice on Assignment of Ministerial Functions (Instrument) was amended to create the Ministry of Minerals (MM), mandated to formulate and monitor implementation of Tanzania’s mining policies. Prior to this, these responsibilities fell under the Minerals Division within the Ministry of Energy and Minerals

(MEM). In January 2018, seven subsidiary legislative instruments were gazetted, which offer further guidance on the implementation of the (amended) Acts<sup>1</sup>.

These changes reflect rising resource nationalism in Tanzania, with the current Presidency actively seeking to better internalise the domestic revenue generation potential of extractive industries in Tanzania, which are largely controlled by foreign stakeholders. The President's focus on the mining sector was evident throughout the 2015 Presidential campaign. Soon after assuming office, the President stressed that Tanzania is not earning its fair share from the country's mining operations, particularly large-scale mining companies. In an effort to regulate the sector more stringently, the President banned the export of mineral ores and concentrates, citing irregularities in estimating the value of contained minerals and the disincentives such exports create in terms of investments in domestic processing capacity. A temporary ban on issuing mining licence was imposed, not to be lifted until internal problems are resolved and new institutional structures are in place.

These decisions particularly affected Acacia Mining, the country's largest gold producer, which derives significant income from concentrate exports (see section 4.1 for more details). They moved into the spotlight when, in March 2017, 277 containers with concentrates were held up in Dar es Salaam Port over alleged undervaluation of concentrates (and resultant royalty and tax underpayment). On 4 July 2017, Acacia Mining served a notice of arbitration against the Government of Tanzania over the ban on exporting mineral concentrates. This was followed by another notice of arbitration by another major gold mining operation, AngloGold Ashanti, over the new Natural Wealth and Resources (Permanent Sovereignty) Act of 2017. At the time of writing, disagreements between LSM and the government are yet to be fully resolved. Since restrictions imposed on exports could be viewed as export quotas, and an export licensing regime, Tanzania, as a World Trade Organization member, may become vulnerable to legal action for breaching its obligations under the General Agreement on Tariffs and Trade (GATT). Provisions under all three Acts may also conflict with Tanzania's bilateral investment treaties promising protection to a number of large mines (eg by denying access to internal arbitration and expropriation without adequate compensation). Such issues could result in further changes to Tanzania's mining regime in future.

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<sup>1</sup> These include: Mining (Mineral Rights) Regulations No. 1; Mining (Minerals and Mineral Concentrates Trading) Regulations No. 2; Mining (Local Contents) Regulations No. 3; Mining (Radioactive Minerals) Regulations No. 4; Mining (Mineral Beneficiation) Regulations No. 5; Mining (Geological Survey) Regulations No. 6; Mining (Audit and Inspection of Records) Regulations No. 7

Table 2: Salient features of the 2017 Amendments to Tanzania’s mining regulations

| Act                                                                                                  | Amendment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The Written Laws (Miscellaneous Amendment) Act, 2017                                                 | <ul style="list-style-type: none"> <li>• Abolishes the Mining Advisory Board and replaces it with the Mining Commission which is a body corporate capable of suing and being sued, which shall be the advisor to the Government on mining matters.</li> <li>• Deleting the Zonal Minerals Officer designation and replacing it with the Mining Commission.</li> <li>• Increased State participation in all mining operations, under ML or SML. The government shall have not less than 16 non-dilutable free carried interest shares in the capital of a mining company. The government can also acquire up to 50% of shares of the mining company.</li> <li>• All minerals in the country shall be the property of the republic and shall be vested in the president in trust of the people of Tanzania.</li> <li>• A PML holder may contract a foreigner for technical support.</li> <li>• There will be Mines Resident Officer stationed in every mining site where mining operations take place.</li> <li>• There shall be a National Mineral Resources Data Bank and the government shall own all mineral data generated. The mineral rights holder shall be required to submit copies of geological data generated to GST free of charge.</li> <li>• Royalties are increased from 4% to 6% and from 5% to 6% of gross mineral value for metallic minerals and gemstones/diamonds, respectively.</li> <li>• Mineral rights holders are required to prepare and seek approval of corporate social responsibility, procurement and local content plans.</li> </ul> |
| Natural Wealth and Resources Contracts (Review and Re-Negotiation of Unconscionable Terms) Act, 2017 | <ul style="list-style-type: none"> <li>• Grants power to the National Assembly to review any arrangements or agreements made by the Government relating to natural wealth and resources.*</li> <li>• After a resolution by the National Assembly to review a contract, the government shall, within 30 days, serve the other party with a notice to review the contract.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

| Act                                                            | Amendment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Natural Wealth and Resources (Permanent Sovereignty) Act, 2017 | <ul style="list-style-type: none"> <li>• Proclaims that the people of Tanzania shall have permanent sovereignty over all natural wealth and resources.</li> <li>• Grants power to the National Assembly to secure and approve interests of Tanzanians in agreements for extractions, exploitation or acquisition and use of natural wealth and resources.</li> <li>• Grants power to the National Assembly to review all arrangements or agreements on natural resources extraction.</li> <li>• Prohibits the exportation of raw resources for beneficiation outside Tanzania.</li> <li>• Stipulates that the earnings from the arrangements or agreements are required to be disposed or retained in the banks and financial institutions in the country.</li> <li>• Prohibits settlements of disputes in foreign court or tribunal.</li> </ul> |

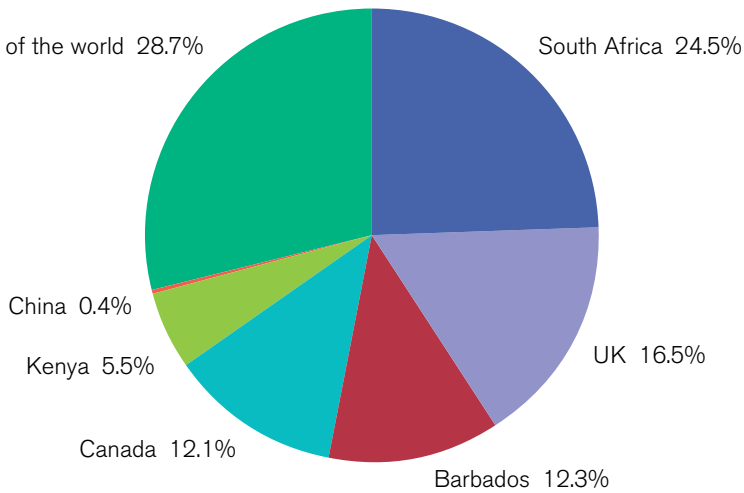
\*This provision was in September 2017 reportedly scrapped in a (yet to be published) amendment to the Act

## 2.2 The role of mining in the Tanzanian economy

Tanzania is the largest recipient of foreign direct investment (FDI) in East Africa, with an FDI stock of US\$18.5 billion in 2015 (UNCTAD 2017). 45.9% of this FDI stock is concentrated in the mining and quarrying sector, followed by manufacturing (16.1%), and increasingly oil and gas (7.9%) (TIC 2015). With some investments into the manufacturing sector likely involving mineral value addition, mining and quarrying constitute the majority of FDI stock in Tanzania. In addition to playing a critical role in industrial development, the mineral economy is also the largest source of foreign exchange earnings in Tanzania. Between 2011 and 2015, minerals accounted for 51.5% of Tanzania's annual average export earnings of US\$5.25 billion (UN COMTRADE 2017).

Approximately two-thirds of the FDI stock originates from only four countries: South Africa, United Kingdom (UK), Barbados, and Canada (Figure 1). Most South African and Canadian FDI flows consist of large capital investments in the gold mining sector, while FDI flows originating from the UK have focused primarily on the oil and gas and beverage sector. Flows from Barbados are more difficult to establish. As a tax haven, most of investors registered in Barbados hail from across the globe. The official contribution of China to the FDI stock (0.4%) is negligible in comparison, though this may increase in future with large planned investments in iron ore and coal mining.

Figure 1: Foreign direct investment stock in 2013 Tanzania by investor origin

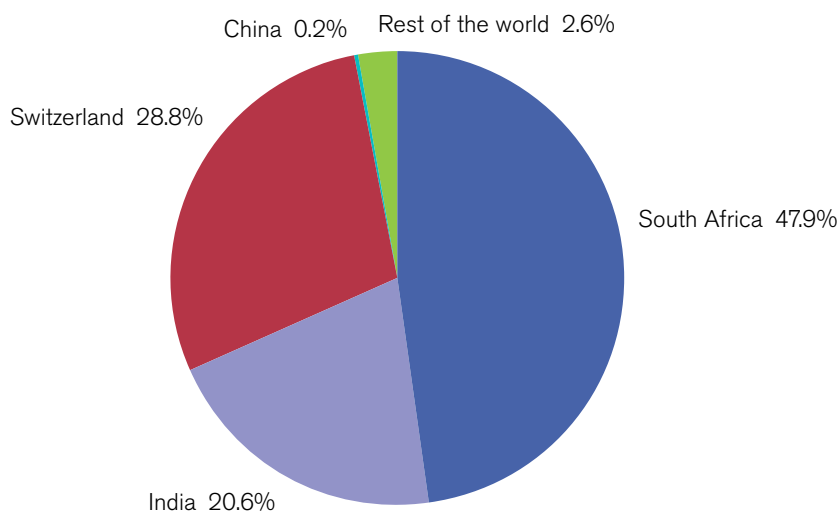


Source: TIC 2015

The target mineral for foreign investors has historically been gold. In 2015, Tanzania was estimated to be the fifth largest producer of gold in Africa after South Africa, Ghana, Mali, and Sudan. In 2016, Tanzania's six large-scale gold mines produced an estimated 44,293 kg of unwrought gold. This was exported in its entirety at a value of US\$1.8 billion (TMAA 2017), equivalent to 31.1% of Tanzania's total export earnings. The Geita Gold Mine, owned by South Africa's AngloGold Ashanti, accounted for 34.6% of production of the six large mines, with the three mines operated by Canada's Barrick Gold subsidiary Acacia Mining (Bulyanhulu, Buzwagi, and North Mara), accounting for 57.9% (*ibid*). The remaining output is largely attributable to STAMICO's subsidiary Stamigold and Shanta Gold from the Channel Islands. The Geita and the three Acacia gold mines all process gold ores into dore bars onsite, though none presently have the capacity to refine them into pure gold, which is undertaken outside Tanzania. Dore bars are semi-pure alloys of gold and silver, typically with a gold purity exceeding 85%. The gold that cannot be effectively recovered from concentrates have until recently been exported as concentrates.

The major export destinations for Tanzanian gold are South Africa and Switzerland, which between 2011 and 2015 accounted for 76.7% of the total gold export value (Figure 2). These trade patterns are primarily a reflection of the gold refining networks of major gold producers in Tanzania. As one of the world's largest gold markets, India is also a major export destination. With jewellers of Indian heritage based in Tanzania playing a prominent role in purchasing and processing gold originated from ASM, their market networks in India presumably accounted for some of these exports.

Figure 2: Major export markets for Tanzanian gold (2011–2015)



Source: UN COMTRADE (2017)

Official statistics only capture production data provided by SML and ML licence-holders, however. Gold produced through ASM is not systematically tracked. On the basis of monitoring and auditing, the Tanzania Minerals Audit Agency (TMAA) estimated that in 2016, 1,450 kg of gold have been produced through leaching and elution plants in Mbeya, Mwanza and Geita (TMAA 2017). Only 30.1 kg of gold directly produced and/or sold by ASM was recorded by monitoring and auditing activities (*ibid.*). Considering that around 685,000 ASM miners are active in Tanzania (URT 2011), of which 60 to 67% are primarily engaged in gold production (Bryceson *et al.* 2012), the amount of gold directly produced by ASM is likely considerably larger than TMAA estimates. Some estimates suggest that ASM is responsible for 10 to 15% of total national output (UNEP 2012), which would be equivalent to approximately 4,500 to 6,750 kg per annum. Although the reprocessing of tailings is increasingly emerging as a viable enterprise for small-scale producers, the large discrepancy between audited production through leaching and elution and directly from mining highlights that ASM gold output may be significantly higher than official statistics suggest, with most gold obtained through amalgamation likely traded on informal markets.

In contrast to neighbouring DR Congo and Zambia, copper in Tanzania was rarely specifically exploited in the past; it tended to be mined as a by-product by the large-scale gold companies. According to TMAA (2016), the large gold mines produced 6,487 metric tonnes (MT) of copper concentrates in 2015. Equivalent to approximately 1,600 MT of contained copper, this is insignificant compared to Zambia's output of 750,000 MT of contained copper in 2016. Due to the comparatively low volumes produced and the nature of the ores, none of the large mines found it economically viable to invest in copper

smelting and/or refining capacity. Until a March 2017 ban on ore and concentrate exports to promote investments in domestic value addition, copper has mostly been exported as ores or concentrates.

In the 2010s, Tanzania experienced a surge in copper ore mining. Between 2006 and 2012, Tanzanian copper ore and concentrate exports increased from nil to 37,134 MT (at a value of US\$324 million) (UN COMTRADE 2017). The lion's share of these exports (51.4%) was destined for China, the largest copper importer in the world. Comparable increases in the quantity of gold and manganese ores imported by China were also observed in this period. Since ores tend to contain numerous minerals, it is highly probable that significant proportions of other types of ores also contained copper. After 2012, coinciding with a drop in world copper prices, copper ore exports gradually fell, with only 1,325 MT officially exported in 2015. Regardless, the rapid rise in (copper) ore exports over the early 2010s points to an increase in copper mining activities in Tanzania, which, considering quantities, likely does not solely originate from the large-scale mines. Recent environmental and business permit applications for small- and medium-scale copper smelters suggest that a domestic copper market relying on ASM is emerging and investors are beginning to appreciate Tanzania's copper production potential. However, declining world copper prices may have slowed interests in the sector, as falling export quantities appear to suggest.



# 3

## Methods

### 3.1 Approach

To identify suitable case studies and develop a better understanding of broader industry context, scoping visits were undertaken to Mwanza, Geita, Arusha, Singida, Dodoma, Kilimanjaro, Kigoma, Mbeya and Katavi regions between September 2015 and April 2016. These regions were identified as important mining hotspots, with some evidence of Chinese participation, based on analysis of secondary data and available literature. The scoping visits involved 123 key informant interviews with regional and district government and chain actors using a snowball approach on *inter alia* (changes in) value chain dynamics, major local and foreign chain actors, geographic distribution of mining activities, and environmental, social, and governance challenges.

Scoping results revealed that Chinese investors are currently active primarily in gold and copper exploitation. Since dynamics in the Tanzanian gold and copper value chain differ significantly due to the nature of the commodity and differences in sector maturity, it was decided to sample two Chinese mining investments in each chain for more rigorous case study analysis. This enables comparisons not only between actors in the same chain, but also across chains. In the selection of the four case studies the following factors were considered: (a) scale and maturity of investment to enable analysis of impacts; (b) location to ensure a diversity of Tanzania's geographies are captured; and (c) the availability of a suitable comparator in order to more effectively contrast the conduct of Chinese with non-Chinese actors (eg one within the same geography and sector and of similar size). Case study investments are summarised in Table 3.

Table 3: Case study investments

| Location           | Mineral | Chinese mine | Comparator |
|--------------------|---------|--------------|------------|
| Geita Region       | Gold    | 1            | 2          |
| Mbeya Region       | Gold    | 1            | 1          |
| Kilimanjaro Region | Copper  | 1            | 1          |
| Dodoma Region      | Copper  | 1            | 3          |

At each selected site, key informant interviews (89 in total) were held with investors, local government, community leaders, and other chain actors to identify sustainable development implications of mining activities and place-specific value chain and political economic dynamics. Around the Chinese mining operations, 155 semi-structured surveys with local miners involved in the mining operation were administered. These interviews served to identify socio-economic characteristics of those integrated into Chinese mines, livelihood impacts, and (perception on) labour conditions and relations. Issues similar to those captured by the survey were also discussed through 19 focus group discussions with other important local stakeholder groups such as youth and women in host communities and those employed at comparator mines.

Findings from the research activities at the four sites were used to design a follow-up political economy analysis. This involved interviews with 9 national-level government departments in Dar es Salaam and 13 regional and district-level departments. Framed around regulatory issues faced and posed by the case study investments, these interviews aimed to generate more in-depth insights into interactions between government departments across sectors and scales, conflicting and overlapping mandates, capacity constraints, and incentive and accountability structures.

## 3.2 Limitations

Emerging medium scale mining (MSM) is a politically sensitive issue since widespread non-compliance with prevailing mining and associated tax and environmental legislation is prevalent and partially condoned. Moreover, as a dynamic and profitable sector characterised by widespread informality, it is widely recognised as an important source of extra-legal public rents. Consequently, unpacking such processes raises numerous challenges since many stakeholders are reluctant to disclose sensitive information. Therefore, large numbers of interviews and extensive triangulation of findings were necessary.

Due to the plethora of confounding variables, isolating the effect of Chinese markets and actors on value chain dynamics and socio-economic development and the environment is decidedly complex. While using counterfactual case studies gave valuable insights into differences in the conduct between Chinese and non-Chinese owned projects, it must be recognised that external validity is limited. Still, by systematically unpacking the role of different types of actors and markets in Tanzania's gold and copper value chains, this research is well placed to tease out behavioural particularities and patterns to permit some degree of extrapolation.

Moreover, because of funding limitations, surveying activities were not undertaken with individuals at comparator projects. Instead, the topics covered in the surveys – such as labour conditions and relations, livelihood contributions, and broader community impacts – were tackled through focus group discussions. Although this limited the opportunity for quantitative comparisons, the focus group discussions did yield valuable qualitative insights into between-project differences and dynamics.

Our research activities preceded the legal amendments approved in mid-2017 that fundamentally changed the functions of MEM and TMAA and introduced new rules governing the sector. This may over time alter state-business relations, quality of regulatory oversight and value chain dynamics more generally. This study therefore has been unable to observe the effects of these amendments or evaluate the effectiveness of the new regulatory institutions and instruments it has produced (notably the Mining Commission that is expected to be formed in March 2018). However, our analysis of the existing political economic context will provide important insights into the challenges that the Tanzanian government may encounter and need to account for when effecting these institutional reforms and implementing new sector rules. Similarly, our analysis of value chain structure and investor behaviour offers insights into the potential implications of new rules on (sub-) sector development. In particular, this research can be viewed as a baseline study (seeing that it was completed only two months prior to amendment approval) against which reform progress can be assessed.



Young men pour water into a powdered mix of gold and other materials during the extraction process at Nsangano Gold Mine, Mawemeru village, Geita District, Tanzania on March 19, 2015. The gold will remain stuck to the surface of the wet towels, while the lighter materials will wash away. While effective, this method is not as profitable or environmentally friendly as more advanced techniques that omit the use of mercury. Credit: Brian Sokol/Panos Pictures



# 4

## Value chain dynamics

### 4.1 The evolution of the Tanzanian gold value chain

The gold value chain is highly fragmented, with large-scale commercial and ASM producers serving different markets and engaging different types of chain actors. The six large gold producers are vertically integrated, involved in all activities from mining to exporting. Gold is processed through gravity separation and carbon-in-leach/carbon in pulp (CIL/CIP) into dore bars on sites, with ores and tailings originating primarily from on-site mines. These companies mostly mine through SMLs that cover some of Tanzania's largest proven gold reserves, most of which had already been exploited by large-scale mining companies well before Tanzania gained independence. Gold dore bars are exported to overseas refineries in the absence of adequate domestic refining capacity. Tanzania's only large-scale refinery, Dar-es-Salaam based Mwananchi Gold Company, closed in 2007, after one year of operation, due to ownership disputes. AngloGold Ashanti, for example, exports its dore bars largely to Rand Refinery in South Africa – one of the world's largest gold refineries co-owned by

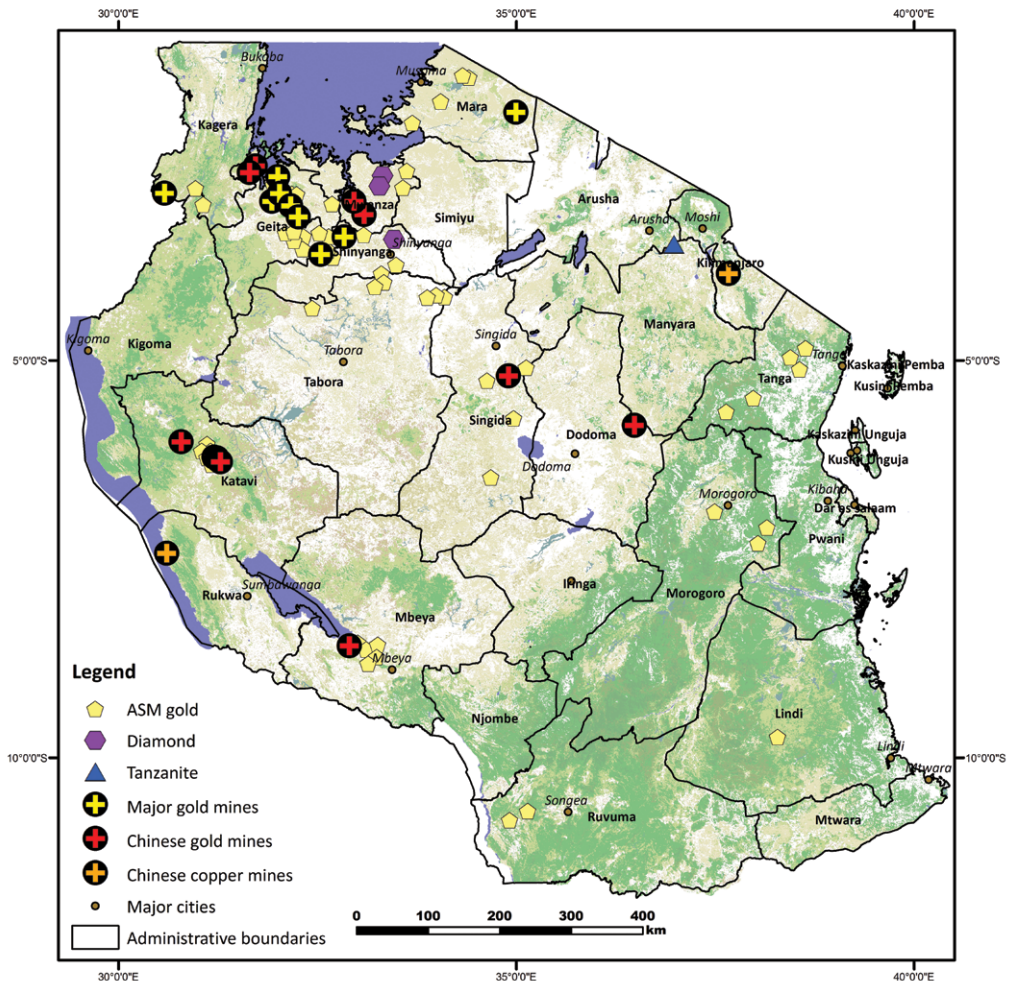
AngloGold Ashanti – which refines an estimated 80% of Africa's gold. Acacia Mining in contrast exports its dore bars to refineries in Switzerland, home to five of the world's ten largest refineries, which collectively account for 38% of total global annual refining capacity (The Real Asset Company 2013).

In contrast to the other four SML mines, ores extracted at two of the Acacia Mining mines are sulphide rather than oxide ores. Since a large proportion of gold in sulphide ores is locked within sulphide minerals alongside copper and silver that cannot be recovered without specialised smelting or roasting facilities, approximately half of Acacia's gold is exported as concentrates produced through froth flotation, typically to copper concentrate smelters in China (Marc Richmond) and Japan (Sumitomo Metals). In most cases, dore bars and concentrates are refined or smelted under tolling agreements, where the processor is paid a fixed processing fee and the minerals remain under ownership of the mine. The mines then sell the gold to intermediaries – notably gold bullion banks, which offer amongst others vaulting, clearing and trading services. The international refining and trading process is typically regulated through the London Bullion Market Association to safeguard gold quality and establish chain of custody. Because refineries often operate on small profit margins, are heavily regulated, and rely on cheap and reliable electricity access and economies of scale, it is rarely viable for major gold mines to invest in on-site refineries (or copper concentrate smelters). Nevertheless, construction of such processing facilities in Tanzania has been at the forefront of recent demands from the Tanzanian government to LSM investors to enhance value addition. Whether this will happen given viability concerns is yet to be seen. No tangible commitments have been made to date.

Most LSM gold projects in Tanzania are located along the Lake Victoria Greenstone Belt that passes through Geita, Mwanza, Mara, Simiyu, Shinyanga and Tabora regions in northwest Tanzania. Although large prospecting licences have been allocated to companies outside the Greenstone Belt, only few large investors with SML and ML licences are actively mining for gold outside the traditional areas, the exception being Shanta Gold with its New Luika Mine in Mbeya Region.

Although approximately 80% of Tanzania's more than 500,000 ASM gold miners are concentrated along the Lake Victoria Greenstone Belt, ASM gold production is considerably more geographically dispersed than LSM. Traditional ASM gold mining areas include the Lupa goldfields in the southwestern highlands (Mbeya region), the Mpanda goldfields in the west (Katavi region) and the Sekenke goldfields in central Tanzania (Singida region). The ASM sector has historically played an important role in new gold discoveries, which in recent years resulted in rapid expansion of ASM gold mining to regions such as Tanga, Morogoro, Lindi, and Ruvuma (see Figure 3).

Figure 3: Overview of gold mining in Tanzania

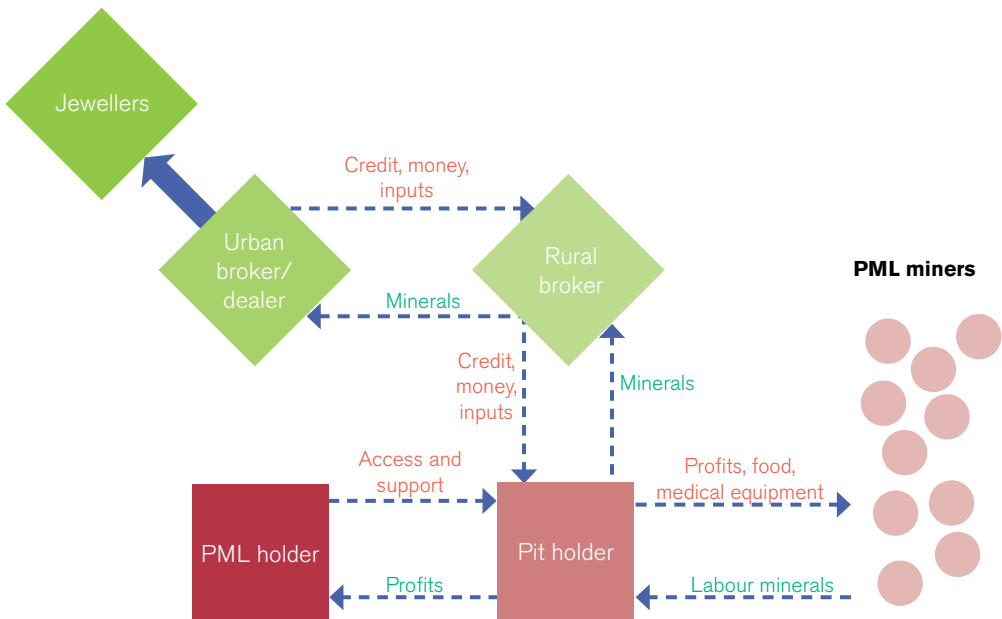


Source: Authors' representation based on research findings and Bryceson *et al.* (2012); MEM (2017)

Tanzania's ASM gold value chain is considerably more dynamic than the LSM chain, involving more complex business linkages and a larger array of different economic actors. Gold mining itself is typically organised through either a two or three-tiered profit sharing arrangement. Mining activities are typically coordinated through so-called pit holders, who source mining inputs and make the necessary capital investments to develop the mine. They subsequently organise and oversee labour activities at the site, involving drillers, diggers, hoisters, and watchmen. The relationship between pit holders and the workers is often governed by informal output sharing arrangements, with each receiving a percentage of gold ores produced (sometimes after deduction of pit holders' costs). Amongst workers, gold proceeds are generally distributed on the basis of worker roles through internal arrangements. While pit holders provide food and contribute to medical

expenses, workers do not receive wages; their incomes are dependent solely on the mine's gold output. Since pit holders are responsible for operational expenses and capital investments, they bear most of the financial risk. Where the mineral rights are under licence, which in recent years is increasingly the case, a three-tiered system prevails that includes the PML holder. In such cases, the licence holder is responsible for ensuring legality of operations and often informally sub-leases the mineral rights to pit holders in exchange for a share of outputs. While most licence holders lack mining experience and therefore require the expertise of pit holders for successful exploitation of their PML, in some cases the licence holders may also be the pit holders (Mwaipopo *et al.*, 2004; Jønsson and Fold, 2009) (see Figure 4 for a stylised depiction of the ASM value chain).

Figure 4: Typical ASM value chain structure



Gold ores are processed in close proximity to the mines where water is readily available. Processing firstly involves crushing the ore with hammers (or a jaw crusher) and then grinding the reduced-size rocks into fine particulates using dry ball mills. The ground ore is then concentrated by washing it over a sluice, before mixing it with mercury to amalgamate the gold. The amalgam is subsequently heated to evaporate the mercury. In the past, processing was often a standalone activity. Processors were either paid with tailings (ie the slurry remaining from sluicing and amalgamation that can be used for reprocessing) or for their labour. Some mines transported their ores to processors themselves, while others sold ores to middleman on site based on estimated gold content. These dynamics began to shift in the late 2000s, however, as the market value of tailings began to rise. Cyanide leaching plants capable of processing low-grade ores and fine



gold particles that traditional methods are unable to separate began to emerge in most major ASM gold mining sites. These tailings contain considerable gold since recovery rates from amalgamation rarely exceed 40%. While large-scale gold mines have long relied on leaching for processing their own ores, due to difficulties in establishing chain of custody and reputational risks of sourcing from informal producers, tailings are rarely procured externally. In an attempt to replicate the success and technologies of small-scale leaching in Zimbabwe, Zimbabwe-linked investors began establishing leaching plants in Geita district in the late 2000s to process the region's abundant and unused ASM tailings. With the local ASM sector not fully recognising the value of tailings, leaching offered significant first-mover advantages. This resulted in a mushrooming of small-scale leaching plants. Initially, the Zimbabweans were followed by medium-scale Chinese, Middle-Eastern and European investors, with much of the ASM sector starting to develop rudimentary vat leaching plants by 2012 as knowledge and technologies became more accessible and the economic potential of investing in further value addition became more apparent. Since the vast majority of leaching plants operate informally, accurate data on the number of leaching plants is unavailable. Around the Lupa goldfields, mining officials estimated that more than 100 leaching plants were operating in 2017. Of these, only 10 were formally registered, according to mining officials.

The rising perceived value of tailings resulting from rising competition has motivated the ASM sector to control processing more closely, spurring greater integration of extraction and processing. With simple vat leaching plants costing as little as TZS 30 million<sup>2</sup>, many ASM mines are now involved in both traditional processing and leaching. Small-scale leaching plants tend to rely largely on their own tailings since they are unable to match the prices of buyers from larger more commercialised leaching plants, of whom Chinese buyers in particular have a reputation of paying well for tailings. Leaching typically occurs on the outskirts of villages to reduce health risks associated with cyanide use.

Elution – to desorb the gold that is loaded onto activated carbons during the leaching process – is typically undertaken in larger towns due to the need for reliable electricity access. Chunya, the closest major town to the Lupa Goldfields, currently hosts 12 elution plants. Since the costs and technical complexity of establishing an elution plant exceed those of leaching plants, elution plants tend to be standalone operations (the exception being some of the larger foreign owned leaching plants which often have elution capacity). Moreover, like large international refineries, because of the comparatively small margins and benefits derived from economies of scale, it is rarely viable for small mines to invest in this type of processing. Most elution plants operate through tolling arrangements, with those bringing in the loaded carbons retaining ownership over contained gold.

The gold obtained from amalgamation and leaching is typically sold to local brokers that tend to operate across varying scales. At the village-level, larger numbers of small,

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<sup>2</sup> This is equivalent to approximately US\$13,500 at January 1, 2018, exchange rates.

often unlicensed, brokers buy and sell gold. In major gold producing areas such as Itumbi in Mbeya and Nyarugusu in Geita, between 10 and 15 brokers are typically active within a village at one time. These brokers tend to sell and be connected to larger brokers or sometimes dealers in large towns and major cities such as Chunya, Geita, Mwanza, Arusha, Mbeya, Dar es Salaam, and Nairobi, with the two latter cities being the main export centres (Jönsson and Fold, 2014). Brokers play an important role in the development of the ASM sector. Most brokers provide financial capital to pit holders, allowing them to develop the mining infrastructure and shoulder the running costs. They are also the principal suppliers of mercury, which, due to increasing stringent use and sale regulations, is often smuggled into Tanzania from Zambia (where it passes through from Zimbabwe and South Africa) and Kenya through urban broker and jeweller networks (Lassen *et al.* 2016).

Broker profit margins have begun to decline in many places. This is due to the sector's maturity, low barriers to market entry, declining ASM gold output in established gold mining areas, increasing availability of market information to miners through mobile technologies, and a high degree of competition amongst buyers. Typically, brokers will pay 85–90% of world market gold prices. As a result, suppliers wield substantial bargaining power, with brokers attempting to differentiate themselves to and lock-in suppliers by offering forward support services. These arrangements are often informal. Brokers themselves usually receive loans from larger urban brokers and dealers to provide these support services and are in turn locked into their own supply arrangements.

Most of the gold passing through these broker/dealer networks ultimately ends up with domestic jewellery makers or dealers associated with this segment, either in Dar es Salaam or in Nairobi. Better-resourced and independent local brokers may bypass urban brokers and sell their gold directly to jewellers to maximise profit. However, because of the risk of being robbed in the process, travel expenses, and dependency on urban brokers for capital, most small brokers are compelled to seek the protection and support associated with being embedded in influential trading networks, which tend to expand across different gold producing zones and for some into international markets. Significant quantities of gold from the northeast is smuggled in unrefined form to jewellers in Kenya, especially Nairobi.

Most of the gold originating from Tanzania's ASM sector, however, seems to be sold to one of a few Tanzanian jewellers, all of whom are said to be of Indian/Pakistani descent. These jewellers typically have numerous stores or buying entities across Dar es Salaam and Mwanza and buy gold 'over the counter'. Since this node of the value chain is highly consolidated, with many of the major jewellers being intimately connected through shared social and familial networks, they have substantial leverage in dictating terms of trade. As they also often finance urban brokers and are an important source of mercury, they are arguably at the head of ASM resource dependency structures. These jewellers generally

smelt ASM gold using borax and acid treatment in small-scale back-yard operations to enhance purity, which is subsequently processed into jewellery or simple gold bars. Popular opinion holds that ASM gold is then typically smuggled overseas (especially to UAE and India) through jeweller networks. But according to some jewellers, because Tanzania is a net importer of gold jewellery and domestic demand remains unfulfilled by domestic production, it would make little sense to export ASM gold or jewellery either formally or informally.

## 4.2 Penetrating mature markets: the emergence of PML-MSM partnerships in gold

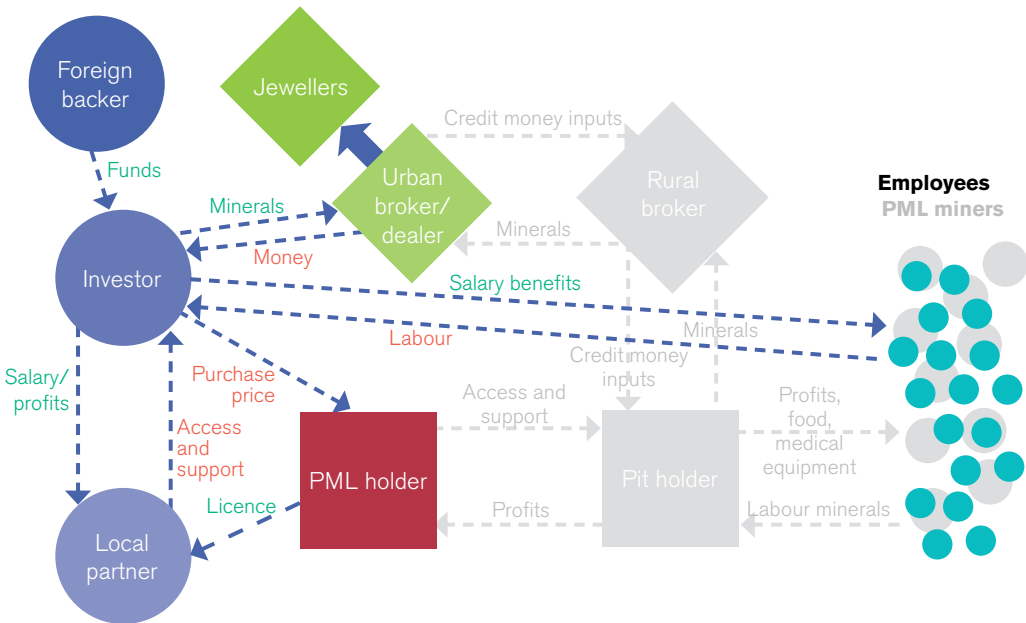
As a comparatively mature value chain, with small midstream profit margins and a tightly controlled end-market, there have arguably been few economic opportunities for Chinese actors to effectively participate in the gold trade. As a result, we were not able to identify any notable Chinese actors in this segment. Chinese and other foreign investors were quick to capitalise on and exploit inefficiencies in the incipient tailing market, however. When the tailing market began to emerge and ASM miners were unable to fully appreciate the economic value of tailing, oversupply and information asymmetry were profitably exploited by early movers. In this context, Chinese and other foreign actors were able to easily penetrate and significantly capitalise on the tailings market. In contrast to most other leaching plant operators, Chinese actors exploited their comparatively significant financial capacity to purchase large volumes with terms that were typically better than those offered by their competitors. Compared to most other leaching plants, the Chinese-owned plants were often backed by affluent investors in China prepared to take significant risks due to the highly saturated mineral economy in China. Most non-Chinese owned leaching plants tend to pay miners half the estimated value upfront, paying the other half once the tailings have been processed. This reportedly often led to significant payment delays, mistrust and conflicts. In contrast, most Chinese plants pay upfront and at higher prices, often stock-piling tailings to ensure plants run at optimal capacity. As a result, the price per MT of tailings more than quadrupled over the past five years in Mbeya, from approximately TZS 30,000 to TZS 130,000 per MT. Across the board, interviewed leaching plant operators and tailing suppliers ascribe this to heightened, Chinese-driven, competition. In the Geita area, six Chinese leaching plants seem to be operational at the time of the research, while the tailing market in Mbeya is almost fully controlled by one large Chinese leaching plant with a processing capacity of 250MT of tailings per day.

In addition to processing, Chinese actors in recent years also began to participate in service delivery. The Geita cyanide, caustic soda and quicklime market – essential

chemicals for leaching and elution – is for example controlled by two Chinese chemical suppliers. Moreover, most of the more modern and efficient CIP/CIL plants in Geita are reportedly constructed by Chinese companies. Chinese actors have therefore played an important role in facilitating the development of the leaching market and in turn helping it mature to a point where tailing prices better reflect their true economic value.

Most foreign leaching investors began to explore opportunities to develop their own mining operations as rising tailing prices and competition and dwindling supply began to affect profit margins. LSM companies, including Chinese state-owned companies such as Henan Mining and Anhui Geology, typically enter the sector by applying for a prospecting licence and subsequently an ML once geological surveying activities have identified viable deposits. However, many MSM companies, especially those that initially entered the market upstream, are increasingly commencing mineral extraction activities through PML holders instead, without investing in the necessary prospecting and permitting. While Tanzanian law prohibits non-Tanzanian companies from engaging in PMLs in forms other than technical assistance, MSM companies are increasingly buying PMLs (through Tanzanian partners or employees) and/or partnering with incumbent PML holders (see section 5.3 for more details and Figure 5 for a stylised depiction of how investors penetrate ASM value chains).

Figure 5: Typical mode of MSM penetration into ASM gold value chain



These companies often invest in upgrading PML mining and processing infrastructure and take over responsibilities ordinarily ascribed to pit holders. This approach to accessing and exploiting mineral rights is for junior MSM companies considered to

be less expensive, time-consuming and bureaucratically complex. The formal process, for example, involves considerable investments in prospecting, feasibility studies, and environmental impact assessments – often taking more than five years before investments in mining can be made. Engaging PMLs in areas with proven deposits also reduces the imperative to invest in prospecting. Moreover, few mineral and prospecting rights over established gold mining areas are available. The six SML mines control an estimated 85% of Tanzania's proven gold reserves, the remainder being controlled by PML holders. Therefore, accessing proven reserves areas with known gold mining viability in Tanzania often requires the engagement of existing licence holders.

In the short term, this partnership model seems to benefit the parties involved: investors obtain access to mineral rights and mining operations, Tanzanian PML licence holders receive financial compensation, and mining workers receive stable salaries (see section 6 for details). In the long term, however, it will likely fail at transforming Tanzania's ASM sector to achieve full social, environmental and economic performance. This is because it allows foreign investors to take over *de facto* ownership and management of ASM mines and replace the traditional profits-sharing structure with a wage structure without investing in local employees' skill development. These implications are discussed further in Section 5.3, 6 and 8.

Most of the Chinese and other foreign companies that invested in leaching plants are now also participating in gold mining, initially almost exclusively through existing PMLs. Although it could be expected that many of these companies would export directly through their own (foreign) trading networks, due to the low profit margins absorbed by brokers and jewellers there has been little imperative to bypass local intermediaries. Most of the gold produced by these companies thus enters the market through traditional ASM-broker-jeweller channels; the recent usurping of ASM by medium-scale mining companies has not disrupted long-established ASM trading structures. On the contrary, some brokers indicated that the investments by foreign companies in upgrading ASM mining infrastructure and in reprocessing tailings have increased the availability of gold on the ASM market. Foreign investors often struggle to break into this long-established trading structure.

An example is the attempt by the Federal Bank of the Middle East (FBME), through its subsidiary African Precious Metals Ltd. (APM), to buy gold directly from miners. Between 2006 and 2009, APM established five gold buying offices in the area south of Lake Victoria (Mwanza town, Nyarugusu, Rwamagasa, Ushirombo, and Nyakagwe). However, they all closed down after only a few years. With the purchasing and operational costs as well as the royalty, they were simply not able to compete with local buyers, who in addition had close relations to many of the miners, providing operational loans, equipment and mercury.

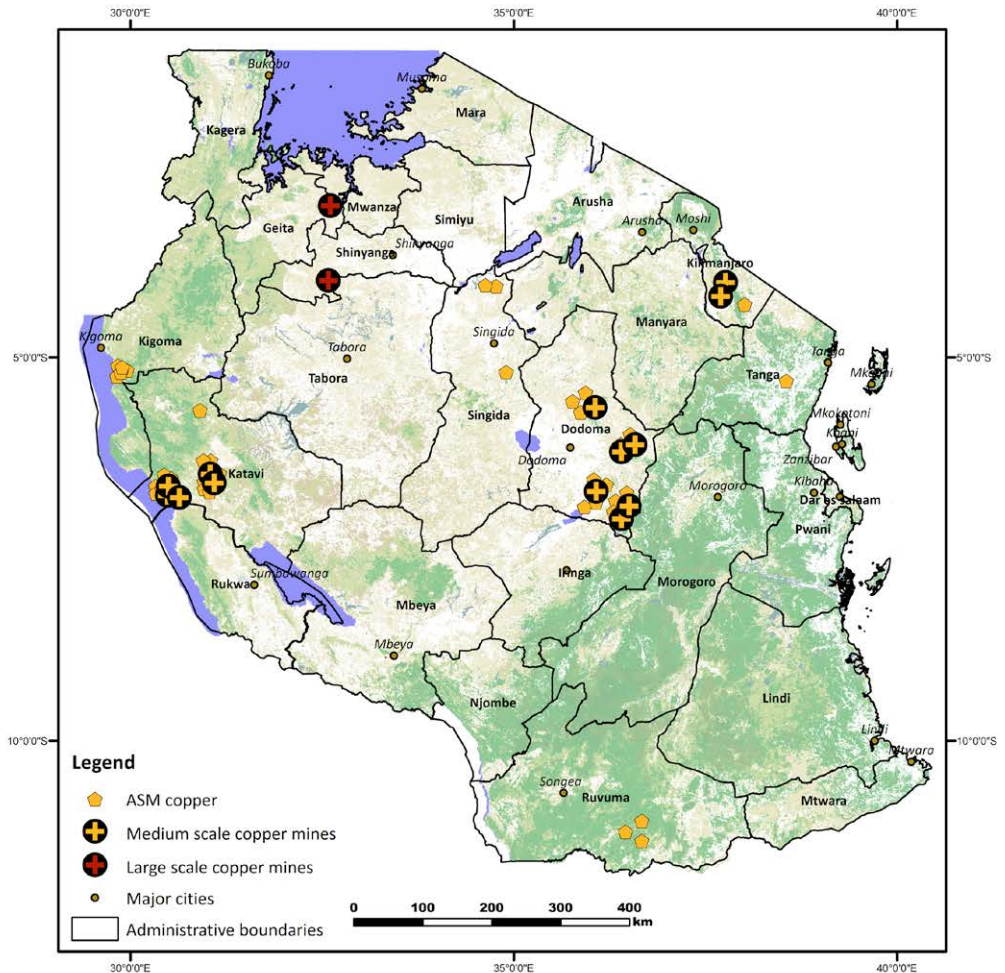
## 4.3 The emergence of new informal markets: the case of Tanzanian ASM copper

German and British companies attempted to mine copper in the Kilimanjaro region in the 1930s and 1950s, respectively, but abandoned these operations due to the poor grade of the copper ores. Besides having long been mined as a by-product in the two Acacia mines, Bulyanhulu and Buzwagi, and exported as concentrates, copper has in the latter half of the 20<sup>th</sup> century rarely been expressly targeted. But rising demand for copper – driven especially by industrial development in China – began to drive up world copper prices in the late 2000s. By 2010, copper prices peaked at almost US\$10,000 per ton, up from less than US\$2,000 in five to ten years earlier. Despite the absence of domestic copper mining capacity, record copper prices prompted many Chinese buyers and/or their agents to explore opportunities to source copper in Tanzania, also because they had been unable to effectively penetrate the captive copper markets of Zambia and DR Congo.

Initially, Chinese buyers engaged Dar es Salaam and/or upcountry brokers – often through Chinese intermediaries such as individuals who for a long time have had well-established business networks in Tanzania as well as the Tanzania-China Mining Association – to explore opportunities for sourcing copper ores from areas with presumed copper deposits. With news of Chinese demand for local copper ores rapidly spreading, as brokers began to actively scout for suppliers, miners familiar with local mineral occurrences began to independently invest in the extraction of copper. In a pattern resembling those of earlier gold rushes in Tanzania, new miners were quickly attracted to areas where ores could be viably extracted. This encouraged those capable of effectively navigating the PML licensing process (typically not directly involved in extraction) to seek exclusive access to those deposits, often for more speculative and/or investment purposes. As a result, ASM copper mining began to emerge at scale in Mpanda (in Katavi region), Ibagwa and Londoni (in Singida region), Mpwapwa and Chamwino (in Dodoma region), Kilosa in Morogoro region, Uvinza in Kigoma region, Handeni in Tanga region, Mwanga and Same in Kilimanjaro region, and Tunduru in Ruvuma region (see Figure 6). Between 2011 and 2013, more than 3,000 PML applications for copper mining were approved, with only a handful of PML licences for copper predating that period. This surge in PML applications prompted the MEM to demarcate ASM copper mining areas in Uvinza, Tunduru and Mpanda.

Much of the copper ores mined by ASM were of insufficiently high grade to warrant exporting at low volume; concentration of copper in ores rarely exceeded 15%. Although ores with less than 1% copper is profitably mined in some parts of the world, this requires close vertical coordination and investment in large processing facilities in order to benefit from economies of scale. Because Tanzania's incipient copper sector lacks such processing capacity, large volumes need to be exported to offset low margins resulting

Figure 6: Overview of copper mining in Tanzania



Source: Authors' representation based on field research and MEM (2017)

Note: Large-scale mines depicted in the figure only produce copper as a by-product. In contrast, copper mining is (officially) the core business of all depicted medium-scale mines.

from high transportation costs for the export of low-grade ores to China to become commercially attractive. Because the ASM sector, with little experience in mining copper at a large scale, was unable to consistently meet surging demand, many Chinese buyers began to forward finance PML holders and supply equipment to help ramp up production and mine at greater depths. Such support arrangements, typically channelled through brokers, often failed to significantly enhance output. One reason was that capacity of Chinese buyers to provide meaningful technical assistance tended to be limited, with most Chinese buyers drawn to the sector from other sectors – ranging from timber to cattle and textiles – in pursuit of quick returns. When copper prices plummeted in 2014 back to the levels of the early 2000s, most Chinese buyers exited the sector, sometimes

abandoning equipment and supply agreements. Many of our non-Chinese interviewees claimed that the tendency of Chinese entrepreneurs to source through intermediaries defrauded many. For example, the quality of the ores in actual shipments often did not reflect the quality of copper ores given for sampling prior to purchasing, with samples allegedly often originating from DR Congo or Zambia.

Recognising that processing ores enhances the economic viability of exporting, some investors began investing in copper processing facilities during Tanzania's copper boom. Some of the first investments in copper processing included a small Taiwanese-owned froth flotation plant in the port of Tanga (for sulphide ores), an American-Korean leaching plant in Dar es Salaam (for oxide ores), and a small Danish-owned smelter in Dar es Salaam. The leaching and froth flotation plants typically bought ores from ASM, concentrated these to 25–40%, and exported them predominantly through Chinese buyers to China. All but the Tanga plant ceased operations as a result of either legal or financial issues.

Problems with sourcing copper of adequate quality and quantity also drove increased investment in mining. Moreover, compared to gold, copper deposits are considerably less likely to be subject to competing claims. As a result, a number of larger companies were able to secure MLs for copper extraction – notably, Kastan Mining (US) in Kilosa, Sino-Energy (China) in Mpanda, Loyal Faith (China-South Africa) in Mpanda, and Zhong Tan (China-Tanzania) in Mwangi. Although these companies did invest in mining infrastructure and geological surveying, none are actively mining their MLs, with Kastan and Zhong Tan having completely ceased operations. It has been suggested by some stakeholders that some of the Chinese ML holders sought to obtain MLs without intention to invest in its development, but rather to resell to large mining companies unwilling to invest time and resources in the bureaucratic ML application process.

The companies that made the most significant capital investments into the sector and continued to operate as copper prices collapsed were those engaging PML holders. At least 10 MSM companies from a variety of countries (eg China, Oman, India, Russia, USA, and Canada), which were operating through PMLs at the time of research were identified, operating under arrangements similar to those in the gold sector. In the research areas, two companies – one in Kilimanjaro region involving Chinese investors and one in Dodoma region involving Indian investors – also invested in froth flotation plants in close proximity to their PMLs. The Indian plant, constructed by a Chinese company, became operational in 2016, while the Chinese plant started operation in 2017. While both companies began extracting ores and developing stockpiles well before commissioning their processing facilities, both plan to source copper ores from ASM in due time. One of the other Chinese mines also plans to construct processing facilities. This could reinvigorate the local copper ore market, as most ASM ceased operations in 2014 when copper prices collapsed and buyers exited the market.



Tracing the evolution of Tanzania's copper market illustrates the chaotic dynamics of emergent informal sectors. In this case, the commercial viability of copper mining and trade in Tanzania was unknown, thereby deterring early movers from incurring high sunk costs in the establishment of mining infrastructure, especially as the copper price bubble was unlikely to sustain itself in the long-run given comparatively low historical prices. Without direct commercial relations between buyers and suppliers, intermediaries played a pivotal role in matching demand with supply. In the absence of market intelligence and established markets, buyers were highly dependent on intermediaries to minimise transaction costs, especially as early producers were small and highly geographically dispersed. Because laboratory testing of small ore quantities from numerous sources was not viable prior to buying and rules of engagement were poorly defined, both intermediaries and miners were well positioned to exploit buyer dependency and vulnerability. This exploitation is also partly unique to the Chinese business model, with many neglecting to undertake proper due diligence such as feasibility studies and geological surveys. This reflects a broader business model commonly observed among Chinese SMEs operating in Africa (Weng *et al.* forthcoming), which some interviewees view as a “gambling mentality” underpinned by access to risk capital.

As opportunistic behaviours eroded trust in the market and prices collapsed, most buyers withdrew from the sector and ASM miners lost their market. The only remaining investors were those active higher up in the value chain able to overcome trading risks by exercising greater control over production. This resulted in the usurping of ASM at the expense of productive engagement of ASM. Nevertheless, investments in processing capacity could create new market opportunities for ASM in future, especially because direct trustful relations between suppliers and buyers are more likely to develop now that investors are more active upstream and intermediaries can be more effectively bypassed. Though with the ore and concentrate export ban now in place, copper mining operations will either need to invest in establishing smelting operations, as one of the sampled investors claimed to be doing, or increase their dependency on external smelters. This may in the short-term result in monopolistic relations between copper miners and processors until adequate investments in processing capacity have been made in Tanzania and competition creates more equitable pricing structures. Given the potentially detrimental effects of the export ban on the fledgling copper sector, improved midwifery by government would be appropriate to prevent the collapse of ASM copper under such monopolistic conditions.

# 5

## Political economy

### 5.1 Key public institutions and regulations

This section provides an overview of the key public institutions that govern the mining sector and the regulatory frameworks that guide their activities in order to provide the necessary background for the following political economy analysis concerning Tanzania's mining governance regime and the distribution of roles and responsibilities amongst relevant public institutions. It is based on key informant interviews and analysis of relevant policies and legislation.

#### Ministry of Minerals (MM)

The overarching policy and legislation guiding the activities of the newly established MM are the Mining Policy (2009), the Mining Act (2010), as amended in 2017, and the Natural Wealth and Resources (Permanent Sovereignty) Act 2017 (see section 2.1), and a host of subsidiary legislative that establish sector-specific rules on *inter alia* environment, occupational safety and health, trade, local content and beneficiation. With the Mineral Division of the MEM now elevated to the status of a ministry, the MM is now headed by its own dedicated minister. This is likely to be an advantage in that the Minister and the Permanent Secretary will be able to dedicate more time to the mining sector than before, where the rapidly growing energy sector had also been part of the ministry's portfolio.

Before the 2017 amendments to the Mining Act and the establishment of the MM, the Mineral Division of the MEM operated through a decentralised structure, with the central ministry supported by 26 regional offices. This included 10 Zonal Mines Offices (ZMO) and 16 Resident Mines Offices (RMO), which were responsible for implementing and enforcing the Act. The ZMOs had responsibility over between two and five regions, while

the RMO often over a single district where mining activities are especially prevalent and closer monitoring and support is deemed necessary. All MEM administrative layers had responsibilities for inspections, with central MEM undertaking inspections nationwide – often at mines of national strategic interest – and ZMOs in mining areas within their jurisdictions that were not already served by RMOs. These inspections in theory covered the full spectrum of mining legality issues, ranging from licensing to health and safety, labour rights, environment and royalty payments. While central MEM had the sole authority to allocate MLs and SMLs, PML allocation were fully decentralised to the ZMOs, including approval of Environmental Protection Plans (EPP) that are mandatory for all PML holders. The RMOs in turn had the authority to allocate blasting, explosive storage and carbon movement (for leaching) permits. Extension support also tended to be the remit of RMOs.

The 2017 amendments to the Mining Act removed the ZMO designation and transferred all responsibilities to the Mining Commission. In the execution of their duties, RMOs are now also accountable to the Mining Commission, though none of the amendments resulted in an explicit change in the RMOs' roles and responsibilities. However, as executive officers now accountable to the Mining Commission, RMOs' responsibilities will now likely also include some of the Mining Commission's auditing functions that were previously the responsibility of TMAA (likely by integrating TMAA auditors into the RMO structure). By conferring regulatory functions onto the Mining Commission, MM responsibilities are more limited than the Mineral Division of MEM and restricted to policy development and monitoring of the Mining Commission. This is also reflected in the reduced responsibilities and authorities of the minister of MM compared to the minister of MEM.

## Tanzanian Minerals Audit Agency (TMAA)/Mining Commission

As pressure mounted to better capture gold revenues in Tanzania, the former MEM has since 2003 actively audited production at major gold mines, first through contracted assayers and later through the Gold Audit Program (GAP). Following the 2009 Mining Policy, the TMAA was established as a semi-autonomous agency under the Executive Agencies Act to carry forward these activities in a more independent capacity. As justification for establishing a separate agency, the TMAA was not only mandated to audit production for corporate tax and royalty purposes, but through Memoranda of Understanding with the Tanzanian Revenue Authority (TRA) and the National Environment Management Council (NEMC) also capital investments and operating expenditures, production quality, and environmental performance. Since the TMAA was not an authority, its audits were forwarded for action to MEM, NEMC, and TRA who in contrast do have enforcement capacity.

The TMAA was structured into Minerals Valuation & Laboratory Services, Environmental Monitoring and Auditing, Mineral Production & Export Monitoring, and Financial Auditing and Analysis. Its auditing activities were carried out through nine zonal offices and so-called strategic audit stations. These stations had auditors based in close proximity to processing facilities or in case of the large mines permanently based on-site.

Recent events drew unwanted attention on the TMAA, with the TMAA held accountable for the alleged undervaluation of Acacia Mining's concentrates. Following the recommendation of the Commission charged with investigating the affair, President Magufuli discharged TMAA's CEO of his functions and dissolved its board. In addition, the President ordered the investigation of senior TMAA officials by the Prevention and Combating of Corruption Bureau (PCCB). In the subsequent amendments to the Mining Act, the Agency became redundant, with all of its activities shifted to the newly established Mining Commission, which, in essence, has been made responsible for regulating and monitoring the mining sector in Tanzania by taking over the responsibilities of the TMAA, the Mining Advisory Board, the ZMO and the MEM commissioner of mining.

In contrast to the TMAA, the Mining Commission has regulatory functions and the power to issue, revoke and suspend mining licences, lending it more enforcement capacity (see Section 22 of The Written Laws (Miscellaneous Amendments) Act of 2017 for a full overview of functions). An Executive Secretary appointed by the President, reporting to the Minister of the MM, is responsible for the management of the Mining Commission. In addition to the RMOs of MEM's Mineral Division now reporting the Executive Secretary, The Written Laws (Miscellaneous Amendments) Act of 2017 also created the position of Mines Resident Office (MRO), who is *inter alia* charged with monitoring day-to-day operations and production records "in every mining site where mining operations take place" (Section 27(1)). While the Act does not specify what constitutes a 'mining site', it is likely that MROs will have similar responsibilities as the former TMAA auditors at strategic audit stations. This suggests that while reporting lines will certainly change, the amendments will likely incorporate the executive structures of TMAA and MEM into the Mining Commission without fundamentally altering (and disrupting) the functions of its employees. However, creating a 'leaner' core team of sector experts with diverse expertise and similar reporting lines could generate much-needed efficiency gains. Since the Mining Commission was in early 2018 still to be established, its precise institutional structure is yet to be fully defined.<sup>3</sup>

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<sup>3</sup> A Mining Commissioner who will serve as the CEO of the Commission was appointed on January 9, 2018.

## National Environment Management Council (NEMC)

NEMC was established as a semi-autonomous executive agency under the 1983 National Environmental Management Act to enforce, review and monitor environmental impact assessments (EIA). It is headed by a Director General, which reports to Minister of State for Environment under the Vice President's Office (VPO). NEMC, along with the Division of Environment that is responsible for coordination and developing environmental policies, was transferred to the VPO in 1995 in an attempt to raise the political profile of environmental management issues. As a regulatory agency, NEMC is now responsible for implementing the 1997 National Environment Policy, the 2004 Environmental Management Act (EMA) that repealed the 1983 Act, and the 2005 Environmental Impact Assessment and Audit Regulations. It is structured into five technical directorates, which include Environmental Compliance and Enforcement, Environmental Impact Assessment, Environmental Research and Planning, and Environmental Information, Communication and Outreach. NEMC operates through its headquarter in Dar es Salaam and five zonal offices.

In the mining sector, NEMC is responsible for ensuring all mining and mineral processing operations, including ASM, adhere to Tanzania's environmental legislation. All mining projects in principle require a full EIA, though ASM projects may be exempted when, upon submission of a project brief that details project activities and potential impacts, NEMC is satisfied that impacts can be adequately managed through proposed mitigation actions. In reality, however, departmental coordination for environmental monitoring and enforcement is limited, as discussed later. NEMC has the authority to inspect mineral projects, demand environmental audits, and issue penalties or revoke environmental certificates in case of non-compliance with environmental standards.

## Occupational Safety and Health Authority (OSHA)

OSHA was established as a semi-autonomous executive agency under the 1997 Executive Agency Act to enhance employee productivity by mainstreaming good occupational health and safety (OHS) practices. OSHA is guided by the Occupational Health and Safety Act No. 5 of 2003 and 2009 Occupational Health and Safety Policy. The formal rules are promulgated in the 2003 Occupational Health and Safety Act, which repealed the 1950 Factories Ordinance in order to cover all types of workplaces. Tanzania still lacks a coherent OHS standard, however, with numerous, sometimes disparate, sectoral regulations defining their own set of standards (such as the 2010 Mining (Safety, Occupational Health, and Environmental Protection) Regulations). OSHA is foremost charged with enforcing the OHS Act, which it does through *inter alia* workplace registration, inspections, risk assessments, trainings, and accident investigations. It has the authority to issue fines and compliance/prohibition notices. Besides regulatory

responsibilities, OSHA is also a service provider, offering, for example, advisory services, short courses and medical examinations.

The CEO of OSHA is the Chief Inspector, who reports to the Permanent Secretary of the Prime Minister's Office, Labour, Youth, Employment and Persons with Disabilities (PMO-LYED). OSHA is comprised of three directorates, which include Occupational Safety and Health and Training, Research and Statistics. Like many others, OSHA operates through a decentralised structure, which includes six zonal offices and four regional offices that assist the zonal offices located outside those regions.

## President's Office Regional Administration and Local Government (PO-RALG)

The Ministry of Regional Administration and Local Government Authority was established under the 1977 Constitution, which in turn established Local Government Authorities (LGA) in, amongst others, districts and villages through the 1982 District Authorities Act. The Ministry is now under the President's Office (PO) and referred to as PO-RALG, which is headed by a Minister of State. In the current government structure, the central government is principally represented at the sub-national level through Regional and District Commissioners, both political appointees. These commissioners are charged with ensuring that the activities of LGAs align with government policy objectives. LGAs, which are autonomous and multi-sectoral, are comprised of Councils, which in rural areas are District Councils and in urban areas City or Municipal Councils. In the case of District Councils, the Council is headed by a chairman who is elected by the Council members, which consist primarily of members elected from individual wards (councillors) and Members of Parliament representing their constituency. The administration and management of the LGAs is the responsibility of the District Executive Director (DED) in a District Council; Municipal Director (MD) in a Municipal Council; and City Director (CD) in a City Council, who are Presidential appointees. Lower-level government bodies such as the Village Council and the Ward Development Committee report to the DED.

The primary responsibilities of the LGAs are to maintain law and order and support the development of their jurisdiction through development programmes and service delivery (eg healthcare, infrastructure and agricultural extension). Those departments charged with implementation are in turn monitored and supervised by standing committees that report to the Council. These committees are typically established through sectoral legislation and include finance, administration and planning, education, health and water, and economic affairs, public works, and environment. Of relevance to regulating and supporting the mineral sector are the district land, environmental management, forestry, community development, and investment departments (where established). The land department plays an important role in enabling mining projects to obtain surface rights over their licences areas and in resolving land conflicts; the environmental management department

in monitoring environmental impacts and ensuring proper environmental permitting; the forestry department in monitoring expansion of mining onto forest reserves and ensuring payment of exploitation fees; the community development department in liaising between investors and communities in establishing corporate social responsibilities (CSR) commitments; and investment departments in facilitating investment. While officers in those departments are employed by the LGA, they are often formally also required to report to sectoral ministries.

## Others

Besides supporting OSHA, PMO-LYED, through its Labour Division, enforces the 2004 Employment and Labour Relations Act. They are therefore responsible for ensuring that expatriate employees at mining companies are issued working permits, labour laws are followed, and labour conflicts are resolved. Through regional Labour Offices, PMO-LYED conducts workplace inspections to monitor legal compliance, especially with respect to contracting issues. Labour conflicts are brought before the Commission for Mediation and Arbitration (CMA), headed by the Labour Commissioner.

The Ministry of Water & Irrigation plays an important role in issuing water rights and in monitoring water quality and effluent discharge laws, in accordance with provisions of the Water Resources Management Act of 2009. The Ministry of Natural Resources and Tourism, furthermore, is responsible for ensuring that mining operations adhere to such environmental legislations as the 2013 Wildlife Conservation Act and the 2002 Forest Act. When mining licences comprise areas designated as forest reserves, the Ministry, through the Tanzania Forest Agency (TFA), is responsible for the issuance of permits and ensuring permitting conditions are met.

As a mining licence only affords exploitation rights, licence holders are required to obtain surface rights from the owners of the land in the form of a Right of Occupancy (when outside reserve land). Alienation involves negotiation between parties over terms of alienation (eg compensation payment), as per provisions of the 1999 Land Act, 1999 Village Land Act and 1967 Land Acquisition Act. The Ministry of Lands, Housing and Human Settlements Development is responsible for ensuring compliance with the Acts, assisting in valuations, and resolving conflicts that may emerge; notably in the case of forced evictions. When mining companies are foreign-owned, the Right of Occupancy will be issued in the name of the Tanzania Investment Centre (TIC), which in turn will allocate investors derivative rights.

Finally, the Tanzania Revenue Authority (TRA), with offices at the district level, administers Tanzania's tax laws such as the 2004 Income Tax Act, the 2014 Value Added Tax Act and the 2004 East Africa Community Customs Management Act. Major taxes that TRA seeks to recover from mining operations include (corporate) income tax, withholding tax and value added tax. The TRA has the authority to audit and inspect, receiving support

from TMAA. It is also responsible for issuing export permits and, more recently, monitoring compliance with the ore and concentrate export ban.

## 5.2 ASM informality dynamics<sup>4</sup>

Here, we analyse how informality is manifested in the ASM sector and the relationship between ASM actors and public authorities. In addition to demonstrating the challenges of addressing pervasive informality in ASM, this helps contextualise the political-economic dynamics specific to ASM-MSM partnerships (5.3). We heavily draw on results from research activities conducted at our four research sites, regional capitals, and in Dar-es-Salaam.

ASM activities are most likely to occur without proper licensing during the early phases of a mineral rush. Enterprising economic and political elites with capacity to navigate the licensing bureaucracy quickly follow suit to secure claims to those newly discovered areas – with examples abounding of local politicians controlling more than 100 PMLs in such areas. Recently, an on-line system for applying for PMLs has been launched. The system has been criticised by ASM operators for being too complicated, however. PML holders, often lacking the necessary technical experience to effectively manage such operations, have traditionally outsourced mining activities within their PML to pit holders, by and large through informal agreements resembling sub-leasing. With PML holders rarely investing their own capital and labour in developing their PMLs, they bear little operational risk, while generating high returns when viable deposits are discovered. Arrangements between pit holders and brokers and miners and other labourers are similarly informal. Therefore, while the rights over minerals are often secured through formal channels, how production is organised, returns are distributed, and minerals are marketed is governed almost completely by informal arrangements.

Similarly, because most PML operations fail to comply with myriad pertinent regulations, formal rules are also widely flouted. For example: processing often occurs without processing licences and permits; working conditions rarely conform with occupational safety and health regulations, with miners rarely possessing personal protective equipment (PPE), shafts being poorly reinforced, ventilation systems being absent, mercury being used without protection and retort, and explosives being used without permits and adequate safety precautions; child labour is not uncommon; and relevant environmental regulations – relating to management of waste, effluent and toxic gasses, protection of forests and riverine areas, and reclamation of land following decommissioning – are rarely adhered to, as are Tanzania's many tax regulations.

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<sup>4</sup> Despite changes to TMAA and MEM, we refer in this analysis to the institutional setup at the time of research and writing, in recognition that institutional dynamics may change in response to recent institutional reforms that are yet to fully take effect (see Discussion section for a reflection).



Due to human and financial resource constraints, regulatory agencies rarely actively monitor PML operations. For many, the transaction costs of monitoring PMLs outweigh the returns (eg through royalties, fees and tax incomes), with the more than 30,000 approved PMLs dispersed across often poorly accessible areas. Moreover, few PMLs operate for extended periods of time; less than 10% are estimated to be active at any given time. This reduces the capacity of regulatory agencies to undertake targeted inspections. Nevertheless, even in established mining areas such as Nyarugusu and the Lupa Goldfields, where greater oversight is both warranted and feasible, few authorities systematically monitor legality and performance issues. When mineral rushes occur, MEM does actively promote and facilitate PML licensing, but rarely sanctions PML holders for non-compliance with other mining rules. The ZMOs (before the amendments) and RMOs consider sector development and revenue generation – not impact mitigation – their primary duties. This is reflected also by internal evaluation mechanisms. For example, revenue generation and the number of licence issuances are widely cited as the key performance indicators (KPI) in ZMO and RMO performance evaluations, for which annual targets are set. MEM is often keen to promote licensing since licensing fees are an important source of ministerial income.

TMAA's mandate through its TRA and NEMC MoU is explicitly cross-sectoral, yet, as it is ultimately accountable to the MEM Permanent Secretary, its priorities are in practice very much in line with those of MEM. This is partly reflecting in its staff composition. For example, 20 mineral auditors are employed at its largest zonal office in Mwanza, but only two financial auditors and one environmental auditor. Moreover, when strategic audit stations are established, TMAA first conducts a cost-benefit analysis to determine whether the costs of such a station can be recovered through the expected revenues. This highlights how auditing activities are guided almost exclusively by TMAA's ability to collect royalties; TMAA officials at both the central and zonal level have acknowledged this. ASM activities are thus rarely audited, with mineral auditors strategically focusing on larger processing facilities where it can more viably monitor mineral flows originating from different sources. Following the emergence of elution plants in or in close proximity to urban areas, ASM gold produced from tailings is almost fully accounted for (and formalised). Mineral auditors personally oversee the elution process by placing TMAA seals on processing facilities. When an elution plant wishes to process, TMAA auditors are summoned to remove the seals and supervise processing. This enables auditors to monitor production closely, significantly reducing the capacity of ASM to circumvent their royalty and tax obligations (at least for gold extracted from tailings). TMAA does not systematically conduct production or environmental audits at ASM mines and traditional processing facilities because they are too small, numerous and geographically dispersed. Therefore, gold produced through amalgamation, in contrast to gold produced from tailings, almost exclusively serves informal markets and contributes marginally to public revenues. This is clearly reflected in the 2016 TMAA production data, which suggest that

ASM gold obtained from leaching and elution exceeds that obtained from amalgamation by a factor of 48. In practice, leaching likely contributes less than half of total ASM gold recovered from ores. While this illustrates the scale of tax evasion and/or informality, it also demonstrates how the booming tailing market has increased the ability of the government to capture some revenues from ASM.

NEMC, OSHA and sectoral LGA offices are also disinclined to actively monitor ASM activities. Larger investors are more easily targeted, both from a logistics and costs perspective. OSHA and NEMC fund their inspections through standardised inspection fees levied on registered workplaces and those with environmental certificates. Since ASM operations are often not formally registered with these authorities and/or are reluctant to pay inspection fees, they tend to remain outside their purview. Especially compared to sub-national mining institutions, OSHA and NEMC often lack sectoral expertise and manpower, limiting their ability to effectively inspect smaller operations. For example, only four technical staff are employed at NEMC and five at OSHA in the Northern Zone, whose responsibilities span three regions and all sectors. Similarly, a major gold mining district such as Chunya only has one District Environmental Management Officer (DEMO).

Because NEMC lacks the resources to identify those mineral projects that demand an EIA, it is highly dependent on other institutions to provide them with the necessary information about projects that are incompliant with EIA regulations. While leaching and elution plants and those ASM projects with a large environmental and social footprint require an EIA under the 2004 EMA, very few, if any, have done so. MEM and the LGA (through the DEMO) are well placed but hesitant to inform NEMC about such projects or directly encourage such projects to comply with environmental regulations. NEMC and EIA regulations stifle sector development according to many MEM and LGA officials. LGA officials often also have to contend with local politics. Not only does ASM mining support a considerable proportion of their constituency in major mining districts, many PML holders also wield considerable political influence. DEMOs, and other sectoral departments in LGAs, are in a particularly difficult position. Since they are accountable foremost to the DED and are expected to report to NEMC (and other authorities such as OSHA) through LGA hierarchies, the relationship between local sectoral departments and their ministerial counterparts is often subjected to and undermined by local politics. OSHA's zonal office in the Southern Highlands, for example, experienced hostility from some of the mining LGAs. Moreover, citing safety concerns, some OSHA zonal offices have been unwilling to inspect ASM operations without LGA security support. In the case of MEM, longstanding conflicts over environmental compliance rules also frustrate collaboration with NEMC. For example, a subsidiary regulation of the 2010 Mining Act specifies that PML holders do not require an EIA but an Environmental Protection Plan (EPP), contradicting rules established under the 2004 EMA.

While legally (and as emphasised multiple times during NEMC interviews), the EMA supersedes all other legislation, this remains a source of unresolved tension between the two institutions. An internal Circular from the Commissioner for Minerals reportedly also extended the EPP requirement to small elution and leaching plant operators. In practice, the EPP is merely a formality and poorly scrutinised, and in some zones also poorly enforced. As the EPPs are approved by the ZMO and copies are rarely shared with NEMC, MEM often completely bypasses NEMC when it comes to ASM environmental matters. Although stakeholders at NEMC indicated that they do not have any issues with the EPP, they do contend that the EPP generally fails to properly account for the use of high-risk chemicals such as cyanide. As a result, NEMC want such projects to be registered for an EIA, which will require the preparation of an appropriate Environmental Management Plan.<sup>5</sup>

TMAA does have responsibilities towards NEMC and has greater specialised capacity to undertake comprehensive environmental audits in the sector. However, while audit reports are systematically shared with NEMC, they tend to focus on large operations with EIAs that are already under the purview of NEMC. This also applies to TRA, which, lacking support from the LGA and resources of their own to closely monitor ASM production, is highly dependent on TMAA – not only for information on the value of minerals produced, but also on the more comprehensive financial audits conducted by TMAA. The emphasis by TMAA on larger mines and processors limits TRA capacity to determine ASM tax liabilities.

As mentioned, the trade of gold produced through traditional processing is by and large informal. While larger urban brokers tend to be officially licensed, the smaller rural brokers often fail to obtain the necessary licences. They do so partly to avoid visibility, but also because enforcement is limited. Identifying such brokers is arguably more challenging than identifying active ASM operations because they are not as spatially bound and are more likely to be ephemeral and opportunistic operations. As a result, little effort is devoted to promoting their formality. Regardless, licensed or not, brokers are vested in underreporting the quantities they source to avoid paying taxes, especially for minerals such as gold that can easily be smuggled out of the country or become formalised without being subjected to taxation. For example, when gold is bought by local jewellers and crafted into jewellery, it no longer attracts royalty charges since one cannot ascertain whether the gold was bought as scrap gold (not subject to royalties) or recently mined gold (subject to royalties). Therefore, processing gold into a final product is an attractive

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<sup>5</sup> In a bid to harmonise EPP and EIA requirements, MEM has recently commissioned work to upgrade the EPP by formulating improved EPP guidelines that comply with the EMA. Under the proposed EPP guidelines, NEMC zonal offices will be involved in reviewing the submitted EPP together with the DEMO of the relevant LGA. This is in line with the amendments, which were made to the Mining Act of 2010 under the Written Laws (Miscellaneous Amendment) No. 4 of 2017. The amendments introduced Part VII – Environmental Principles and Liabilities, in which Section 106 stipulates that the licence holder who conducts mining operations shall comply with the environmental principles and safeguards prescribed in the EMA, which is enforced by NEMC.

strategy to circumvent tax obligations and formally bring it to market. Moreover, in jewellery form, gold can be more inconspicuously exported.

## 5.3 Regulating ASM–MSM partnerships

The 'partnerships' that in recent years have begun to emerge in the gold and copper sector between ASM and MSM and between Tanzanian citizens and foreigners have affected how regulatory institutions interact with the ASM sector. Initially, many of these partnerships were established without any direct involvement of public actors. Case study investors typically began their PML engagements through Dar es Salaam based connectors that negotiated terms of PML purchase on their behalf, often without investors personally visiting the sites (let alone undertake geological surveys). In some cases, the PMLs were formally transferred to Tanzanian nationals affiliated with the investor, in others they remained in the name of the original licence holder. Lacking direct engagement with PML holders and due diligence, investors were often defrauded, bought PMLs at heavily inflated prices, or later encountered unresolved licensing conflicts. Wary of engaging Tanzanian counterparts, Chinese investors often relied on local Chinese networks and platforms for market intelligence and intermediation, but experienced similar issues. This highlights how, in contrast to popular perception, Chinese business relations in such contexts are not necessarily characterised by trust and national solidarity. In fact, most Chinese investors interviewed expressed greater distrust towards compatriots than Tanzanian nationals.

Because of the myriad issues encountered in obtaining PMLs in this way, investors either withdrew their intentions to invest (as in the copper sector) or began more directly to involve politically and/or economically influential Tanzanians as partners through minority shareholding constructions. These Tanzanian partners frequently acquired a few dozen PMLs in specific areas of interest and registered these in their own name. They also played an integral role in liaising with local authorities, brokers and dealers and host communities. In at least two of the four Chinese case studies, LGA and/or mining officials familiar with local mining operations and mineral deposits facilitated acquisitions against a commission.

Foreign investors buying up PMLs can do so legally and in their own name when this involves conversion to an ML. As a PML is reserved for Tanzanian citizens, investors are not permitted to undertake any activities on a PML. However, conversion to an ML is a costly and lengthy process – typically involving a feasibility study, an EIA and an Environmental Management Plan (EMP). It also invites additional scrutiny from regulatory authorities and raises costs of production (eg through inspection fees and relevant compliance costs). Therefore, most investors into PMLs will only seek to fully formalise their operations once profitable. This said, we found that where especially high sunk

costs are incurred, for instance when investing in processing facilities, investors were more inclined to undertake an EIA (albeit typically after processing facilities had been commissioned). Both NEMC and MEM officials are less inclined to turn a blind eye to improperly formalised processing than mineral extraction because the unregulated use of toxic chemicals is more likely to produce adverse societal impacts (notably water pollution).

LGAs and most sectoral ministries and agencies consider rules governing PML ownership excessively stringent and insufficiently compatible with local development priorities. With PMLs often used for speculative purposes or limited in their production potential due to capacity and resource constraints, most government stakeholders view exploitation of PMLs by foreign investors as an encouraging development that facilitates ASM upgrading, reactivates dormant PMLs and enhances mineral output. A smaller number of larger operations also enables the government to better oversee, regulate and capture fiscal earnings from mining activities. Foreign investors mining PMLs are therefore largely condoned, with no evidence of any state actors *forcing* such investors to comply with prevailing mining regulations. It is generally feared by LGAs and MEM that doing so will deter investment in ASM. With many of these foreign investors ostensibly lacking the time horizon and resources to develop greenfield mining projects, such fears are likely not unfounded.

While genuine (sector) development concerns partly underlie failure to enforce established licensing rules, the role of complicity, self-enrichment and vested interests can in some cases not be completely dismissed – as illustrated by the role of public officials in facilitating PML acquisition. Arguably, investments that operate on the fringes of legality create opportunities for regulatory authorities to establish and exploit clientelist relations. Most surveyed investors – both Chinese and others – felt unreasonably scrutinised by zonal, regional and district level authorities, accusing them of demanding informal payments to turn a blind eye to non-compliance issues. Regardless of the intentions, most investors are negligent of a host of formal regulations (beside those related to mining licensing and EIA). Many investors initially wrongly assumed that operating under the veil of a PML would allow them to benefit from the *de facto* regulatory exemptions applying to PMLs. Therefore, most commenced their operations by hiring workers informally, employing expatriates without proper working permits and paying little heed to OHS and environmental regulations. Not only have such investors proven to be especially vulnerable to exploitation and extortion in practice, they have also become a primary target for litigation. For example, employee turnover at most surveyed mines is high, as theft of equipment and minerals by employees is rampant and performance expectations are rarely met. The attitude of especially Chinese employers towards local employees is often strongly imbued with ethnocentric undertones. When somebody is dismissed, compensation is often sought through the CMA, which tends to rule in favour of the worker, especially when labour laws were not followed. One Chinese company that

informally employs less than 30 local fulltime workers at any one time claimed to face an average of 30 to 50 litigation actions per year.

In light of these challenges, most of the PML investors that developed commercially viable mining projects gradually upgrade their operations in line with existing regulation. This behaviour is partly a result of the growing recognition that the costs of non-compliance tend to exceed the cost of compliance, especially as investor vulnerability rises with greater capital investment. Therefore, some of the investors surveyed are currently in the process of conducting feasibility studies and EIAs to convert their PMLs into MLs, are now registered workplaces with OSHA, have begun to offer contracts to their workers and pay social security obligations, and regularly host TMAA auditors. Although Tanzanian labour laws prohibit companies from offering employees fixed term contracts for tasks of permanent nature, the vast majority of employment contracts are however for a fixed duration (three or six months), as permanent contracts severely reduce staffing flexibility. While we failed to establish how contracting is typically organised, we found that two investors outsourced all staffing to labour sub-contractors, which in one case was a company co-owned by the investor. This is likely a strategy to protect investors from labour-related liabilities and evade restrictive labour regulations.

As investors are gradually pushed into formality so are the regulatory activities of public authorities. Internal pressure to undertake formal inspections and audits rises as companies become more visible. This often results in a centralisation of regulatory enforcement, with, for example, inspectors from central NEMC, OSHA and PMO-LYED providing more direct oversight. In these national-level institutions, sub-regional offices are often viewed as lacking the technical capacity to undertake proper inspections and/or being too deeply entrenched in local politics to offer objective evaluations. The reluctance of OSHA in the Southern Highlands to conduct inspections due to perceived hostility from LGAs suggests there may be some merit to this view.

In the past, zonal NEMC and DEMOs were for such reasons completely bypassed by central NEMC in the EIA review and environmental permitting process. They often did not even receive copies of the final EIA reports. This has changed with the recent decentralisation of the Technical Advisory Committees (TAC) tasked with providing technical inputs on EIAs. In addition to national stakeholders, the TAC now comprises zonal NEMC and OSHA, the DEMO, and other relevant sectoral departments within the LGA. While inspections of major projects, mining included, remain highly centralised, the decentralisation of the TACs has been well received by sub-national institutions. They like that it makes the EIA approval process more participatory and transparent, improving local access to detailed information about investment projects.

The environmental certificate (like the mining licence) is a powerful instrument in Tanzania. In contrast to OSHA, PMO-LYED and TRA, NEMC (and MEM) have the authority to revoke a certificate (or licence) in case of non-compliance or prevent a project

from coming off the ground by rejecting applications. While MEM for reasons highlighted before is disinclined to cancel a licence, NEMC readily uses its authority. For example, most sampled investors with EIAs have been forced to temporarily cease their operations as a result of certificate suspension, often due to effluent management issues. In all cases, certificates were reinstated, sometimes without violations cited in the compliance notice having been addressed. Arguably, this concentration of authority to determine the fate of an investment project can be easily abused for either personal or political ends. Although this study is not well placed to draw conclusions about this, many investors and government institutions expressed scepticism about NEMC intentions, questioning why oversight becomes more centralised when projects begin operating at scale. The Council's reputation and credibility have recently come into the spotlight, following the decision by the Minister responsible for Environment to dismiss the Council's board of directors and make leadership changes.<sup>6</sup> This was reportedly the result of complaints by local and foreign investors on issues of corruption, bureaucracy, unnecessary delays, conflict of interests and extortions surrounding the EIA procedure.

In our case studies, TMAA used to audit mines more rigorously when investors began to formalise their operations and the business case for targeted mineral auditing improved. This was typically undertaken in collaboration with the RMO and former ZMO inspectors so as not to appear as separate entities. The distinction between TMAA and MEM was often a source of confusion for investors. In contrast to some of the other institutions, their collaboration tends to be coordinated at the sub-national level. Besides mineral audits at investor processing facilities, TMAA also undertook rigorous financial and environmental audits, albeit comparatively infrequently due to human resource (and priority) constraints. For example, a Chinese gold producer that employs more than 300 people across four active mines was, after the initial environmental audit in 2013, re-audited only in 2016. Nevertheless, audit reports (in hard copy) are systematically shared with TRA and NEMC through institutional hierarchies, despite strained relations between the latter and MEM.

Although closer collaboration between MEM inspectors and TMAA auditors would enable more effective oversight, MEM was found to rescind licences only in rare cases of serious incompliance issues with the Mining Act. MEM officials at sub-national level perceived their inspections as having a technical advisory rather than a regulatory function. Despite MEM having a support role in practice, there was little evidence to suggest that MEM sought to promote more meaningful ASM-MSM partnerships. MEM did not seek, for example, to explore mechanisms that would foster technology transfer to local mines, provide more skills development for local workers and enable Tanzanian ASM miners to upgrade operations through investment rather than simply transferring mineral rights

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<sup>6</sup> According to Citizen (2017), the dismissed officials were quickly reinstated, allegedly due to political interference.

and management to investors. Partly, this is a result of a modernist discourse that favours capital-intensive operations. But the tendency of mining officials to emphasise maximisation of mineral output instead of improved distribution of costs and benefits is foremost a product of prevailing incentive and accountability structures within MEM. As discussed in the previous section, this is in large part driven by institutional key performance indicators (KPIs). In the past, it was also driven by revenue retention, with the central government hypothecating a proportion of mining revenues to MEM and TMAA. MEM and TMAA have as a result long been vested in generating fiscal earnings rather than managing societal trade-offs. However, despite revenue retention mechanisms reportedly being abolished in 2015 under the new presidency, changes in priorities were not observed (eg by becoming more attuned to societal demands). One mining office instead suggested that the loss of incentive to actively capture royalties merely reduces fiscal earnings, a claim that is reflected in their own atypical failure to meet revenue generation KPIs.

LGAs have not been directly affected by these changes in budgetary distribution mechanisms. The 0.3% service levy mines are required to pay from their turnover continues to constitute an important source of LGA income. Because of the challenges involved in collecting this levy from informal operations (and arguably opportunities for rent-seeking), LGAs are similarly vested in promoting rather than regulating ASM-MSM collaborations. However, in some cases, formal communication mechanisms between LGAs and investors are lacking, which limits the capacity of LGAs to influence how such collaborations and the attendant impacts evolve. As the RMO, with which most investors tend to liaise at the local level, is not part of the local government setup, many LGAs lament lack of alignment between MEM and LGA priorities. Conflicts that may emerge between the LGA and investors are, therefore, vulnerable to political interference from MEM. This applies both to district and lower level Councils (eg at the village level).

Despite political inference in theory enabling investors to act with impunity towards local communities, most investors, including those of Chinese origin, did actively seek a social licence to operate, especially because project endorsement by community members is essential for obtaining surface rights. In doing so, local customs tend to be followed and CSR commitments based on local demands are made, with Tanzanian partners often playing an integral role in facilitating this process, especially in the case of Chinese investors for whom cultural and language barriers tend to impede effective communication. Nevertheless, in many projects, communication tends to break down as projects mature, conflicts emerge and CSR commitments remain partially unfulfilled. In such situations, Village Councils often resort to addressing the grievances through the LGA hierarchies, which for the abovementioned reasons lack capacity and willingness to intervene or are co-opted. From the investors' perspectives, however, communities and their local leadership at times place unreasonable demands and expectations. One investor described being seen as the go-to solution for financing any large projects. Our



interviews with communities show that there is indeed a reliance on companies to develop public infrastructure such as schools, clinics and boreholes. Shifting accountability for service provision away from the government increases the risk that LGAs absolve themselves from their development responsibilities in mining areas. This is also evident in ASM areas, where LGAs are reportedly less inclined to provide public services since they are not beneficiaries of mineral royalties, and instead expect MEM to take over development responsibilities.





# 6

## Impacts

### 6.1 Employment conditions

The largest sampled MSM employer is the Chinese-owned gold mine in Mbeya, with an estimated 330 fulltime employees (Table 4). Most of the studied MSM mines typically employ between 30 and 70 employees, with expatriates on average comprising one quarter of the workforce. By and large, MSM mines employ expatriates primarily for technical positions such as mining engineers and geologists. Local employees rarely undertake technical tasks; they are usually employed for non-mechanical digging and sorting, loading and moving ores. At the Chinese mine in Mbeya where mining is comparatively mechanised, local employees also operate power drills (classified in Table 4 as a 'technical' task). Nevertheless, with almost half of the mine's employees originating from China, expatriates are predominantly responsible for the mine's more technical activities. Local employees at most sampled mines lamented lack of technical responsibilities and opportunities for knowledge acquisition. No major difference in this regard can be observed between the mines, with most mines contending that because local miners are only exposed to rudimentary mining methods at PMLs they are only qualified for menial tasks. Indeed, one of the investors' chief complaints was the low capacity of the local

workforce, thus raising the cost for investors to hire expatriate employees to fill technical gaps. Only one of the sampled mines, a comparator mine in Geita, invested in training and development of local miners. This mine, incidentally, employed the least number of expatriates (10%).

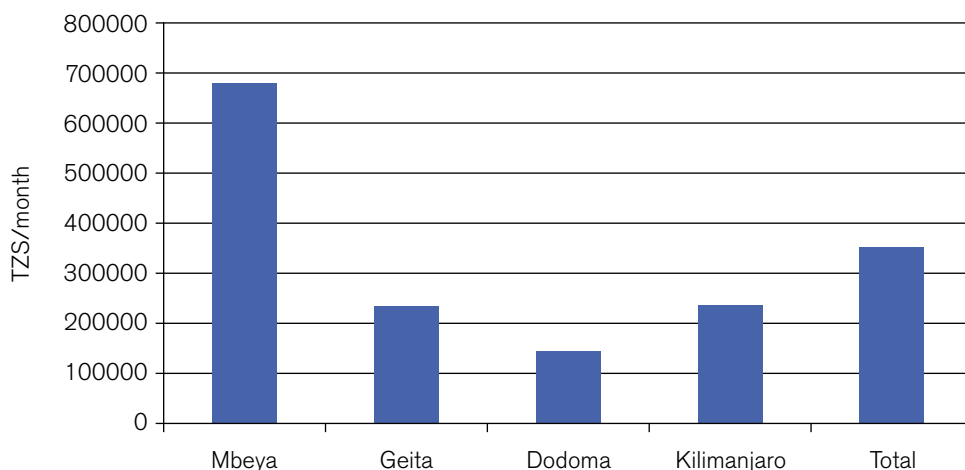
Table 4: Employment generation at Chinese-owned mines

| Investment  | Total employment | Expatriate | Female | Menial (mining) | Technical (mining) | Menial (support) | Technical (support) |
|-------------|------------------|------------|--------|-----------------|--------------------|------------------|---------------------|
| Mbeya       | 330              | 46.9%      | 0%     | 66.0%           | 31.9%              | 2.1%             | 0%                  |
| Geita       | 65               | 23.1%      | 8.0%   | 90.0%           | 6.0%               | 6.0%             | 0%                  |
| Dodoma      | 40               | 27.5%      | 0%     | 41.4%           | 3.4%               | 55.2%            | 0%                  |
| Kilimanjaro | 50               | Unclear    | 0%     | 51.7%           | 17.2%              | 31.0%            | 0%                  |

Only two of the sampled mines were in the process of offering local employees formal employment contracts. Most investors argued that because of Tanzania's restrictive labour laws formal contracts are undesirable since that reduces their flexibility to hire and fire and severely increases labour costs (eg since they then become liable to payment of a range of social security fees and employment tax). Similarly, many employees at those mines now offering formal contracts were also found to be reluctant to enter into contract since that would reduce their ability to decide when to work (and retain flexibility to tend to other livelihood activities) and opportunities for litigation.

Salary payments are either made on a weekly or daily basis. With the exception of the Dodoma copper mine, salaries tend to exceed the minimum monthly wage of TZS 200,000, as set by the government for PML operations (Figure 7). With the statutory

Figure 7: Income per month at Chinese-owned mines



minimum wage for ML operations double those of PML operations, operating through PMLs arguably helps limit labour costs. Interestingly, salaries at the Chinese mine in Mbeya, which, coincidentally, is in the process of formalising their labour relations, are on average three times higher than other examined MSM operations. Approximately 40% of employees at the mine also receive performance-based pay (Figure 8) contingent on quantities of ores moved and loaded onto carts. By and large, investors are disinclined to offer performance-based payments, with especially Chinese investors relying on coercion as a strategy to enhance worker productivity. This is a major difference between PML and MSM employment (see also Figure 4 and 5). Whereas fixed salaries are rare at PMLs for miners and income is derived solely from mineral yields, more steady salaries can be expected at MSMs, but with few opportunities to benefit from windfall profits. This can be viewed as either a pro or a con, depending on individuals' livelihood objectives (and the productivity of a mine). In focus group discussions, some workers expressed that they preferred the steady income, while others would opt for the possibility of being part of windfall earnings. Secondary benefits are rare at most mines (Figure 9). Where these are offered, they tend to involve transportation to and from work and access to medicine.

Figure 8: Performance-based pay at Chinese-owned mines

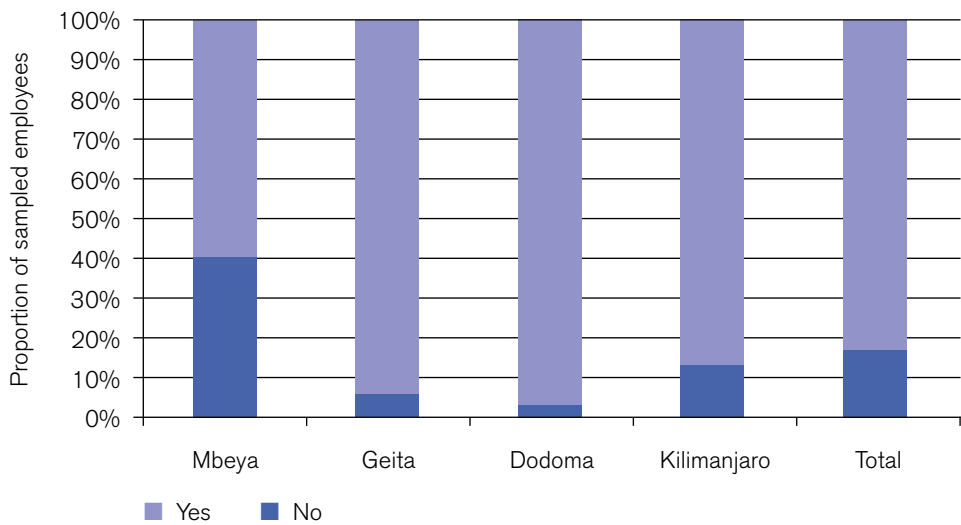
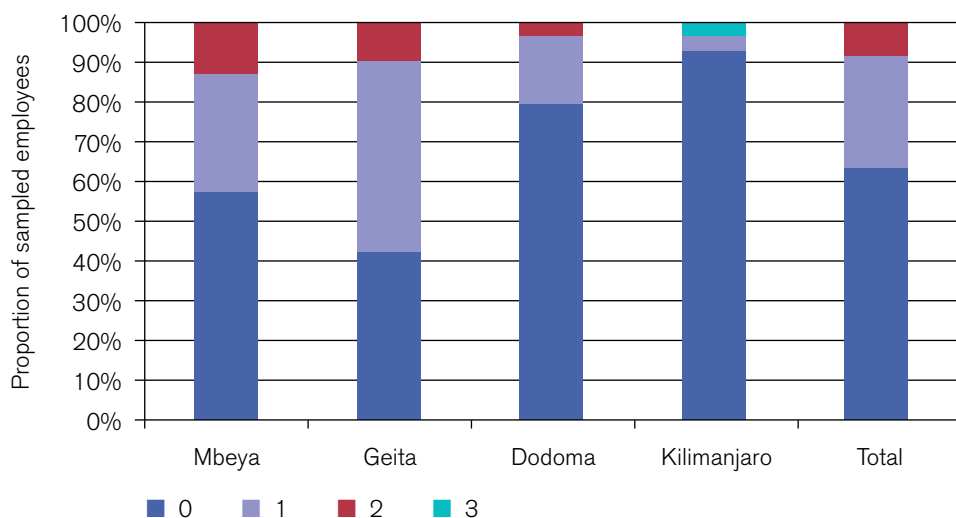


Figure 9: Number of secondary benefits at Chinese-owned mines



Personal protective equipment (PPE) is typically limited to gloves, helmets and boots (Table 5). While outperforming PMLs in this regard, PPE conditions at the sampled mines systematically fail to meet international best practices. For example, earplugs and goggles are rarely provided to miners despite working in environments where power drills and explosives are frequently used. Most mines also appear not to evacuate non-essential workers from the mines when blasting activities are carried out. The incidence of non-lethal injuries preventing miners from working is especially prevalent in the two Chinese gold mines, where the likelihood of sustaining such injuries in a given year exceeds 40% (Table 6). The comparatively low probability at the two copper mines is likely due to their development phase, with both currently investing more in development of mining infrastructure than extraction. This is also reflected in the comparatively large proportion of employees involved in support activities (Table 4). While some medical support is typically provided, when employees experience injuries at the mines they are often granted leave without pay. PPE provisions and OHS standards, more generally,

Table 5: Personal protective equipment at Chinese-owned mines

| Project     | Costume | Helmet | Boots | Earplugs | Goggles |
|-------------|---------|--------|-------|----------|---------|
| Mbeya       | 8.5%    | 80.9%  | 93.6% | 2.1%     | 2.1%    |
| Geita       | 8.0%    | 80.0%  | 70.0% | 0.0%     | 4.0%    |
| Dodoma      | 51.7%   | 55.2%  | 79.3% | 0.0%     | 3.4%    |
| Kilimanjaro | 0.0%    | 58.6%  | 55.2% | 0.0%     | 3.4%    |

were found to be consistently better at the non-Chinese comparator mines than the Chinese mines. That reflects not discrimination towards local workers at the Chinese mines, but rather adherence to less rigorous standards at project-level, with Chinese workers exposed to similar OHS standards. However, even amongst Chinese mines differences in standards can be observed (Table 5).

Table 6: Probability of injury for miners, per year worked at Chinese-owned mines

| Project     | Probability |
|-------------|-------------|
| Mbeya       | 42.8%       |
| Geita       | 47.2%       |
| Dodoma      | 25.5%       |
| Kilimanjaro | 17.7%       |

Most employees perceive working conditions at the Chinese mines negatively (Figure 10). This is often attributable to strenuous working conditions, with coercive management styles and lack of regard for worker safety largely driving these perceptions. Nevertheless, employees with experience working at ASM tend to marginally favour working conditions at sampled MSMs (Figure 11). At Chinese mines in particular, language barriers and unrealistic worker productivity expectations tend to underlie labour conflicts, which appear to be more prevalent than at non-Chinese mines. Because Chinese workers rarely remain at the mines for extended periods of time (as few have official working permits), there are also few opportunities to develop social capital. While this contributes to comparatively high worker turnover rates and job insecurity, some of the Chinese mines do appear to have become more appreciative of the need to promote worker retention, both to reduce exposure to litigation and enhance productivity. This is evident in investments in Tanzanian human resource management to help resolve labour conflicts amicably rather than through dismissal.

Figure 10: Perception of working conditions at Chinese-owned mines

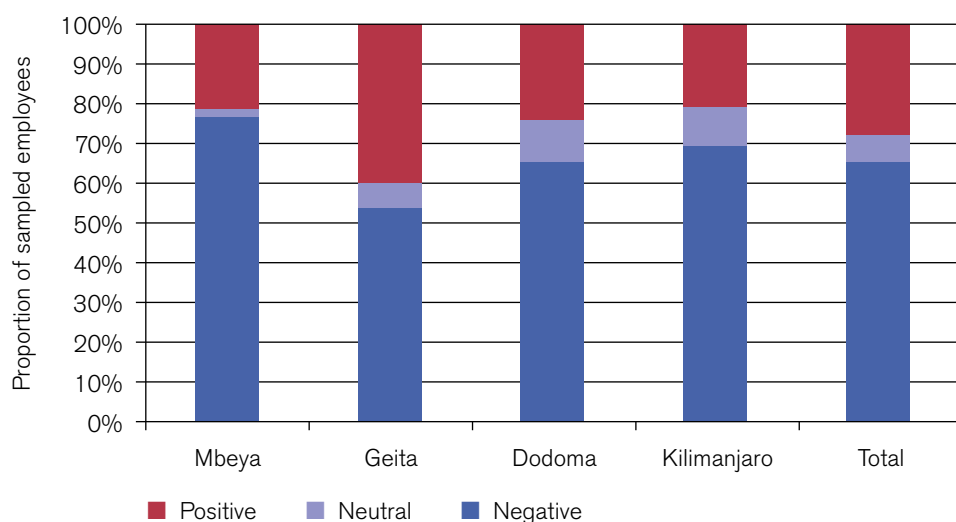
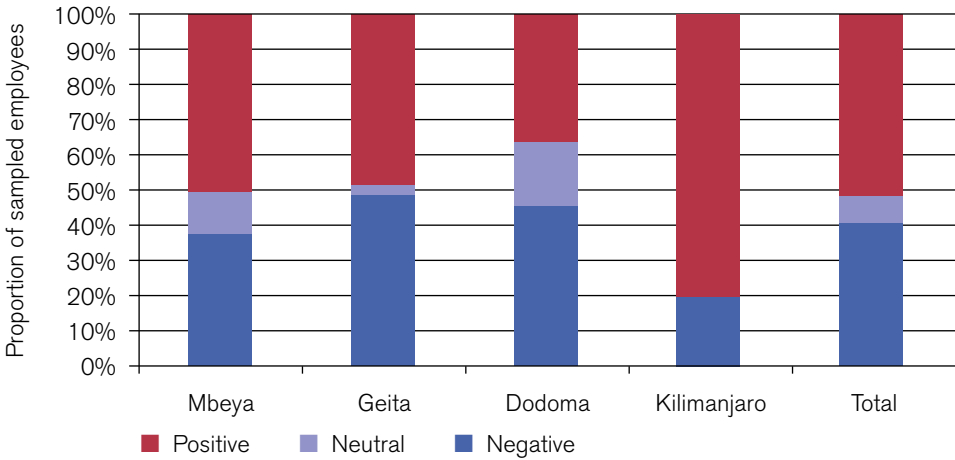


Figure 11: Perceived working conditions compared to ASM at Chinese-owned mines

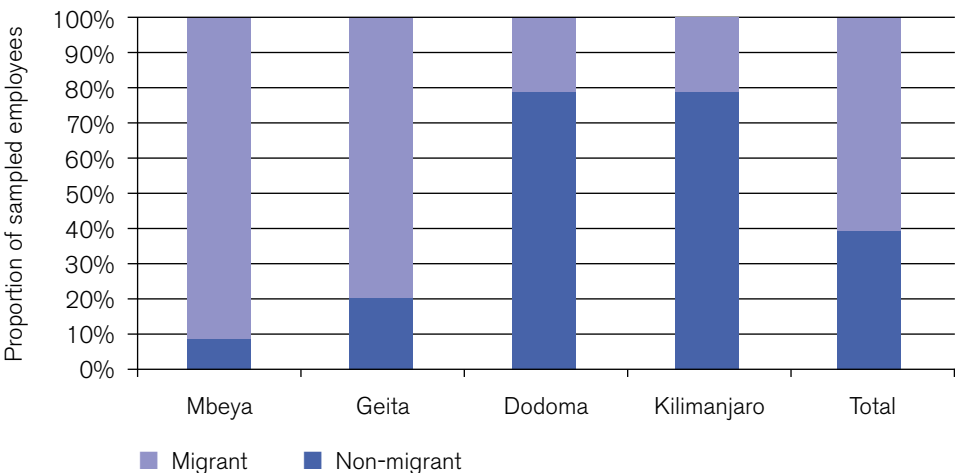


Note: This question only applied to 63 of the 155 surveyed miners that previously worked at ASM mines.

## 6.2 Livelihood impacts

Data across the four sampled Chinese mines suggests that internal migration plays an important role in explaining how MSM employment impacts worker livelihoods. Results demonstrate for example that in the gold mining areas, the vast majority of employees are migrants, while in the copper mining areas most employees are indigenous (Figure 12). Differences in livelihood impacts between investments are potentially attributable more to differences between migrants and indigenous employees than to individual investors, given the comparatively low rates of participation of non-migrants in the agricultural sector (as we will show below).

Figure 12: Workforce composition at Chinese-owned mines, by origin

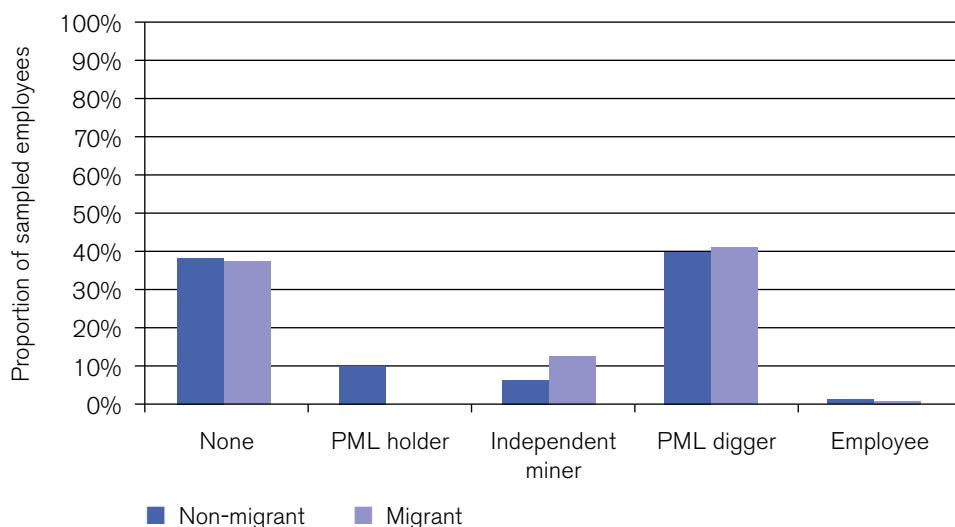




As has been well documented (eg Jønsson and Bryceson 2009), traditional gold mining areas have long been a major destination for domestic migrants. While especially Dodoma, like Geita and Mbeya, has a long history of ASM mining – initially for gemstones and later copper – it lacks the allure of gold. On average, sampled migrant employees migrated to the areas in 2013 at an age of 23, typically from rural areas where off-farm opportunities are limited. This highlights how the mining sector tends to attract young men with ambitions outside the agricultural sector. Because most of the sampled migrants (82%) migrated alone, the composition of migrant and indigenous households differs considerably. For example, the size of migrant households is less than half that of indigenous households, with dependency ratios also being considerably lower. However, external financial obligations (eg through remittances) are likely considerably higher for migrant workers.

In terms of prior mining experience, no major differences can be observed between groups, with 37% of migrant and 38% of indigenous employees not having worked in the sector previously. Most of this experience has been gained working as diggers at PML mines. On average, migrants had 2.7 and non-migrants 3.4 years of mining experience before employment at the MSM mines. Most migrants gained experience after migrating to the area, further highlighting how migrant miners tend not to be sector incumbents (Figure 13). Although most employees did have some relevant experience prior to obtaining MSM employment, few can be considered seasoned miners. This suggests that those long engaged in the PML sector are unlikely to be attracted to MSM employment. Rather, results illustrate that employment is attractive to comparatively inexperienced

Figure 13: Prior mining experience at Chinese-owned mines

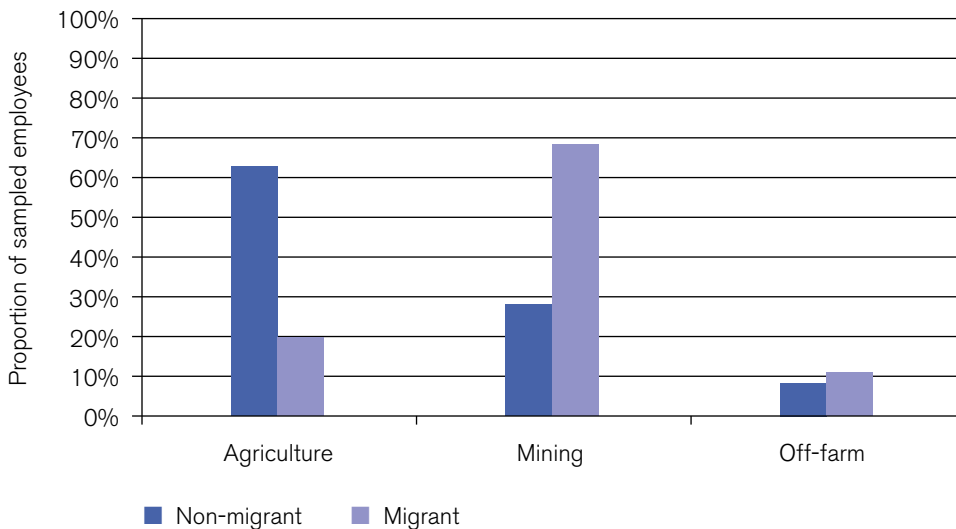


miners that likely did not reap significant benefit from the PML performance-based payment model. Work at the most profitable PMLs is also less accessible to those recently entering the sector.

In terms of livelihood activities, only 42% of migrant households were involved in agriculture besides mining, compared with 94% of indigenous households. This is also reflected in land ownership patterns, with only 5% of migrants owning land, compared with 71% for indigenous households. Those involved in farming and not owning land often obtained access through rental arrangements. Though less pronounced, migrant households are more likely to be involved in small businesses (33% compared with 20%). However, migrant households' livelihoods are considerably less diversified, being involved on average in 1.8 different livelihood activities, compared to 2.4 for indigenous households.

The importance of farming to indigenous households is reflected in the relative value sampled employees assign to different types of livelihood activities. For example, for indigenous households, agriculture remains the backbone of their livelihoods, with 63% considering it the most important livelihood activity (Figure 14). Migrants, in contrast, are considerably more dependent on their income from mining, with 68% considering it their most important livelihood activity. Since indigenous households are more likely to own land and have available additional sources of labour, mining is often a supplementary livelihood activity that fulfils in particular household cash needs, with agriculture primarily serving households' basic needs.

Figure 14: Most important livelihood activities at Chinese-owned mines



The role of mining employment in the generation of household cash income is similar across the two groups, with migrant and indigenous households on average obtaining 68% and 67% of their total cash income from mining, respectively. While few households ceased livelihood activities as a result of mining employment, 11% of indigenous households were found to have ceased their agricultural activities as a result, suggesting some competition between livelihood activities does arise when labour is diverted to MSM employment.

With salaries, except at the Mbeya mine, barely exceeding minimum wage, the income generated from MSM employment has in only few cases (11%) enabled households to reinvest in other productive activities. Despite higher incomes, employees at the Mbeya mine were not found to be more inclined to reinvest their incomes. Investments were made especially in farmland and small businesses, with no major differences between migrants and indigenous workers. Incomes foremost helped employees fulfil household needs, notably food, schooling and health care. Most employees, especially those employed by the Mbeya mine, cited positive contributions across all dimensions (Figure 15–18). Similarly, most employees also claimed to have become more capable of acquiring new household assets. Therefore, although productive livelihood spillovers are limited, the MSM projects do appear to have contributed to improving employee ability to fulfil basic needs.

Figure 15: Perceived food security impacts at Chinese-owned mines

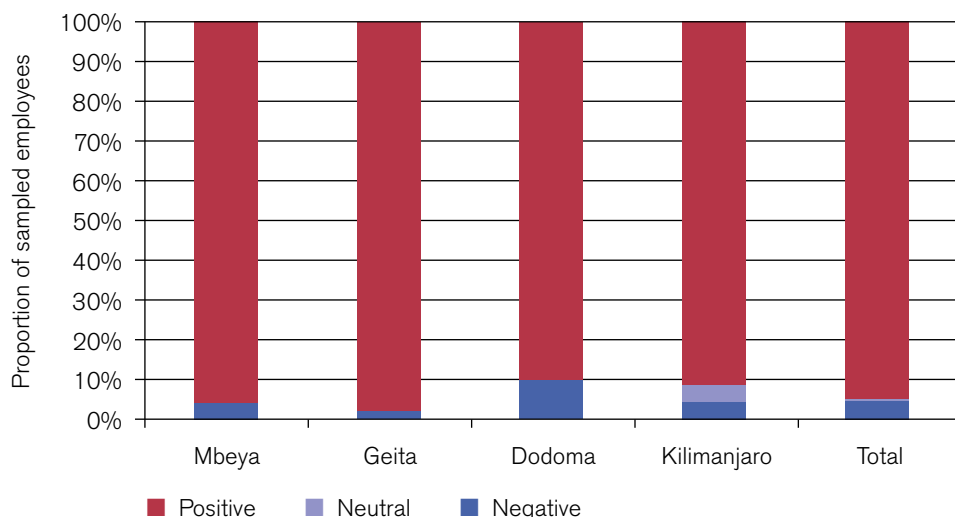


Figure 16: Perceived impacts on ability to pay school fees at Chinese-owned mines

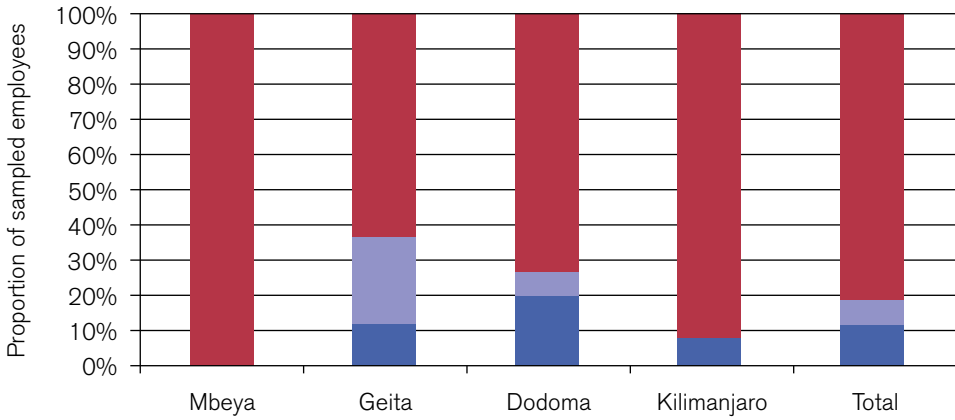


Figure 17: Perceived impacts on ability to pay medical costs at Chinese-owned mines

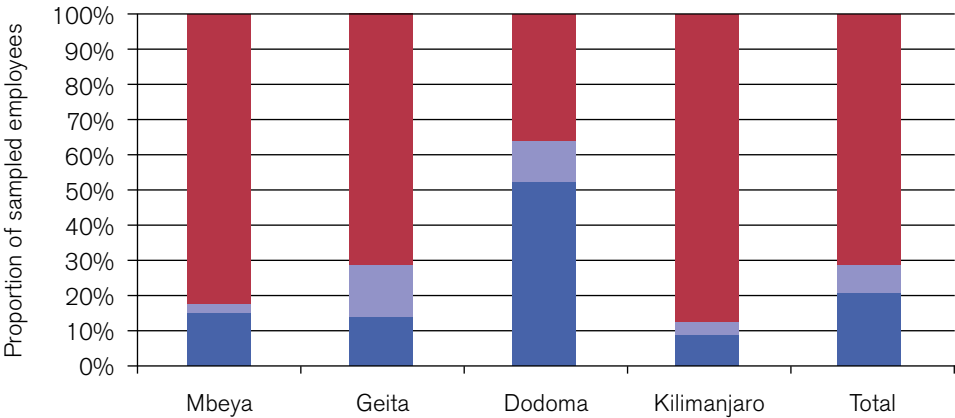
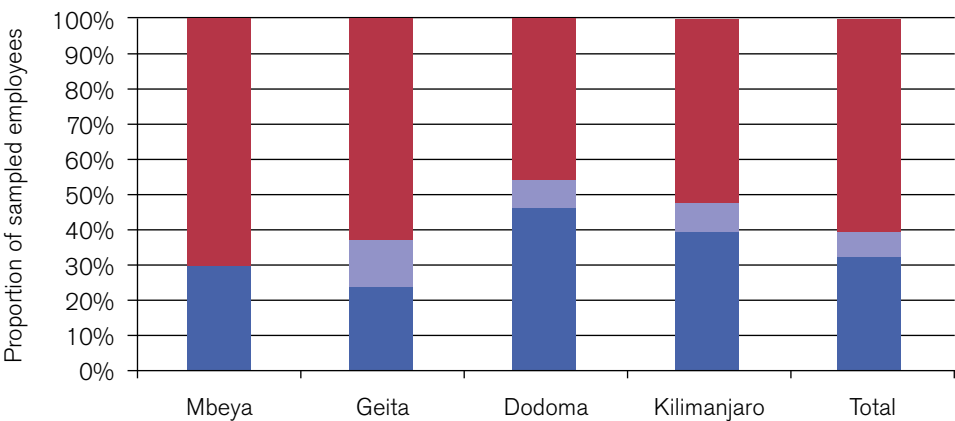


Figure 18: Perceived impacts on household asset accumulation



Key (for all charts above): ■ Positive ■ Neutral ■ Negative

## 6.3 Local development

Most mines make CSR commitments to host communities as part of the mine establishment process. For example, the Kilimanjaro mine bought mattresses for a school, rehabilitated a road, contributed building materials to a mosque, and donated money to a church. In Dodoma, the Chinese mine offered money to acquire water pipes and constructed a road. In Mbeya, boreholes were built, building materials were donated to a local school, and local sports teams were sponsored. The Chinese mine in Geita has invested least in CSR, only contributing (at the time of research) to the construction of a classroom. No major differences could be observed between the Chinese investors and comparator investors. It is generally recognised that accommodating some of the community CSR requests is necessary to alleviate conflict and safeguard operational freedom.

Despite the prevalence of what some respondents viewed as culturally inappropriate behaviour, Chinese investors are mostly considered good neighbours. Significant goodwill was created in many communities by the practice of purchasing goods locally. While lack of employment opportunities is often a key source of youth frustration towards both Chinese and non-Chinese investors, CSR activities often work to alleviate conflicts. In some cases, however, CSR does become a source of intra-community conflict where misappropriation of funds by village leadership is suspected. Moreover, many investors lament how CSR is often regarded by local government as a substitute for public service provision.

Of the case studies, the Chinese mine in Geita experienced especially hostile relations with host communities. In contrast to other Chinese mines, since CSR has not been systematically used as a tool to foster harmonious community relations, cultural infelicities and poor working conditions have been less easily forgiven. The killing of a community member by one of the company guards and the company's strained labour relations further contributed to undermining community relations. The Chinese mine in Geita instead invested in good relations with district government. As a result, the mine has been able to act with impunity, with local government rarely acting on concerns raised by the host communities. Communities suspect that local government officials have been co-opted by the mine.

Relations between the Chinese mine in Kilimanjaro and host communities are mixed. The community that granted the mine access to land tends to be the primary beneficiary of employment opportunities and CSR activities. A community downstream from the mine, which is allegedly affected by water contamination and water flow disruptions, claims to only bear the costs of the mine's development, without deriving any benefits. This frustration not only manifests itself in discontent towards the mine, but also towards village and district government that are perceived to be motivated only by self-interest.

Such dynamics highlight how (perceived) differentiated access to opportunities emerging from new investments can result in heightened distrust amongst local stakeholder groups when capture is suspected.

The most tangible local development contributions besides CSR and employment are the new incomes generated by PML operations from the sale of tailings. This, however, only applies to investors with large leaching facilities such as the Chinese mine in Mbeya and a comparator in Geita. By and large, sectoral spillovers are limited since none of the mines appear to have entered into technical partnerships with local PMLs or, with the exception of the Geita comparator, invest in local employee skills development. However, even that mine complained that their investments rarely resulted in improved productivity as skilled employees often quickly left for better paid jobs at LSMs. Instead, a large number of ASM miners, especially in the gold mining areas of Mbeya and Geita, were displaced when PMLs were acquired – suggesting that besides the demonstration effect, the MSM model that is emerging in Tanzania is more likely to conflict with rather than support the upgrading of ASM. However, in the copper mining areas where most acquired PMLs were dormant, the establishment of MSM instead reinvigorated mining in the area and enabled PMLs acquired for speculative purposes to be used productively.

## 6.4 Environment

The most publically contentious environmental disturbances are attributable primarily to processing activities. Contamination of groundwater and rivers with heavy metals released from the crushing of rock and cyanide from processing is likely to occur – often due to poorly constructed tailing storage facilities (TSF) and poorly covered leaching plants. With processing being a water-intensive activity, considerable volumes of leachate are often released into nearby waterways, resulting in contamination and disruption of downstream water flows. Other pollutants are attributed to lack of toilet facilities and proper liquid waste treatment facilities at some of the mines.

Different stakeholder groups expressed concerns over the impact from MSM on the environment, citing in particular the following issues:

- Clearance of vegetation to make way for the mines and its infrastructure. Some of the mines require large quantities of timber to reinforce mining shafts, most of which is sourced locally. This not only competes with the local demands for timber, but also results in degradation and enhanced susceptibility to erosion.
- Noise pollution from ball mills and crushers, which are often located in close proximity to settlements.
- Cattle fatalities due to livestock keepers grazing their cattle in close proximity to mines that lack adequate demarcation and security of shafts and/or trenches.
- Use of mercury for gold processing.

# 7

## Improved regulation of investor participation in ASM and the 2017 Amendments

All sampled investors that acquired and/or partnered with the holders of PMLs commenced their operations without fully adhering to Tanzanian mining, environmental and labour regulations. Their activities on PMLs, notably in the gold sector, typically resulted in the dismantling of traditional ASM organisational structures involving profit-sharing and the introduction of employee-employer relations akin to those in LSM, albeit on less propitious terms. Such new arrangements resulted in a reduced ability of artisanal miners to directly profit from Tanzania's natural resource wealth, with rents instead accumulating with foreign investors and comprador elites. Lack of investment in local training and development and willingness to engage in partnership constructions that involve technology transfers and the menial nature of accessible employment opportunities, additionally inhibit the productivity spillover potential of foreign investment in the sub-sector. Despite this, foreign investment in PMLs involves introduction of modern production practices and infrastructure, enhances access to stable off-farm incomes, increases national mineral output and public revenues, and brings mineral claims subject to speculative strategies into productive use.

For the Tanzanian state, effectively mitigating the potential risks and better leveraging the potential opportunities of such investments is no easy feat. In particular, our research demonstrates how a number of deep-seated institutional issues prevent the state from better managing these risks and opportunities to support sustainable sub-sector development. These include, amongst others:

- 1) Widespread perception that rules governing PML ownership are excessively stringent, insufficiently compatible with local and industrial development priorities, and deterring much-needed investment.
- 2) Perverse incentives and/or co-optation resulting from reliance on investors for funds (eg through taxes, royalties, levies, and fees) and personal rents.
- 3) Weak horizontal and vertical coordination (mechanisms) within and between different government entities.
- 4) Under-resourced regulatory authorities (eg LGA, NEMC and OSHA).
- 5) Weak alignment of key performance indicators with sustainable and inclusive development objectives within MEM and TMAA.
- 6) Centralisation of regulatory enforcement within NEMC and OSHA and associated disempowerment of sub-national authorities.

The recent legislative amendments driven by Tanzania government's rising resource nationalism have the potential to significantly change the conduct of both investors and government actors. For example, with the government seeking to capture more of the different sources of public mineral income, there is clearly declining tolerance for corrupt practices and tax avoidance strategies. As a result, some regulatory authorities will likely be compelled to regulate investments. This could motivate more investors to formalise their operations, but, conversely, could also contribute to raising sunk and operational costs, which in turn could force poorly capitalised investors to cease operations and deter further investment in the sub-sector. This will likely be reinforced by new domestic beneficiation, 'local content' and government shareholding rules.

Moreover, whether these changing public-sector norms will induce improved regulatory enforcement across all policy domains is yet to be seen. Other sectoral agencies are clearly not subject to the same level of scrutiny as mining institutions. Furthermore, up to now, the government is foremost concerned with capturing value at the macro-level: improving foreign exchange earnings, public income, and enhancing value addition and processing capacity. While the 2017 Amendments and 2018 Regulations do include important new local content requirements, institutionally, the amendments primarily empower and consolidate the authority of mining institutions, not LGAs, NEMC, PMO-LEYD and OSHA. Formerly, TMAA, with its cross-sectoral mandate, played an important coordination role, which was much appreciated by other authorities for improving



transparency and access to information. With the new institutional setup, where the activities of the former TMAA are no longer independent and fully subsumed into those of mining authorities (and accordingly become even more subject to MM priorities), cross-sectoral coordination could suffer despite potential efficiency gains.

While optimising societal contributions and ASM linkages has to date not featured prominently in political discourse, the government's position on management of environmental impacts is a little more ambiguous. On the one hand, a recent commitment – not directly related to mining – to increase the number of certified environmental inspectors from 60 to 435 reflects an effort to improve NEMC's enforcement capacity. Explicit emphasis in the Written Laws (Miscellaneous amendments) Act to the primacy of the EMA may also enable NEMC to more effectively contest the widespread reliance on and condonation of EPPs in the sector. On the other hand, NEMC recently introduced a process to fast-track the issuance of environmental certificates in an effort to stimulate investment. Under the new changes, NEMC provides provisional licences that are issued within three days to enable investors to commence their projects while the EIA process is ongoing. This points to preparedness to undermine the integrity of the EIA process in the name of industrial development.

By and large, recent changes to formal mining rules are unlikely to result in better management of the risks and opportunities associated with foreign investment in ASM (and rather deter these types of investment). This is fundamentally because many of the institutional challenges highlighted above are not fully addressed in the amendments. For such investments to fulfil their potential with respect to helping resolve upgrading barriers facing ASM, institutional rather than legal reforms are necessary. These would involve *inter alia* the introduction of incentives and mechanisms that foster improved horizontal and vertical coordination, changes to institutional mandates and accountability structures, investment in institutional capacities, and development of recursive learning processes in which investment proponents are active participants. This would require the state to adopt a different vision with respect to regulating investments in the sub-sector. In the conceptualisation of Evans (1995), rather than engaging investors in the role of custodian in which the state primarily regulates and enforces rules as it does now, it engages in a combination of midwifery and husbandry; the former implying facilitation, relationship building and enabling collaboration and the latter cajoling and arm-twisting. The successful FDI-led industrial development strategies in East Asia saw states play both roles. Given Tanzania's increasingly developmentalist policies, taking example from East Asian counterparts may serve its development objectives well. However, whether the transformative potential of ASM is fully appreciated by the Tanzanian government is debatable given the lack of explicit reference to ASM in recent amendments and political discourse, which has focused primarily on capturing revenues from LSM rather than productive linkages.

# 8

## Conclusion

This research has demonstrated that small and medium-sized foreign investors are increasingly targeting Tanzania's ASM in both mature (gold) and incipient (copper) markets. Despite the significant proportion of investments originating from China and the pivotal role of opportunities in the Chinese market in driving especially the development of copper ASM in Tanzania, we found a wide diversity of different investors participating in ASM, employing business models not differentiable from Chinese investors. Foreign investments have played an important role in improving the efficiency of ASM gold processing and developing a market for ASM copper ores. They have also contributed to creating employment opportunities in rural areas that offer a more stable income than traditional ASM operations and bringing PMLs that are dormant and/or used for speculative purposes into production.

In spite of their contributions to date, the participation of investors in ASM has not helped resolve barriers to upgrading that prevent ASM from achieving their full social, environmental and economic performance potential. This is in large part attributable to the business model employed by investors that involve taking over management and (de facto) ownership of PML operations, the replacement of the traditional profits-sharing structure with a wage structure, lack of investment in local training and development and reliance on non-Tanzanian employees for technical tasks. Differences between different types of investors in this regard was minimal.

In light of widespread failure to comply with a host of pertinent regulations, investor participation in ASM chains also poses a number of regulatory challenges. Results also reveal structural institutional issues that undermine the quality of government oversight. Again, we could not identify meaningful differences between different types of investors in terms of their engagement strategies and practices vis-à-vis the state, with local intermediaries/partners often responsible for managing state relations. Evidently, clientelism, as opposed to investor origin, plays a more defining role in shaping, enabling

and sustaining business models and practices that do not optimally serve societal interests. This tallies with observations from Hilson *et al.* (2014) in Ghana, who note that such investments are simply the latest expression of informality and government's failure to "recalibrate policy-thinking to adequately reflect the realities and experiences of ASM operators" (p. 302). This has been characteristic of ASM governance more generally across Africa. The prevailing political climate of Tanzania may however create the political space needed to enable policy-makers to challenge the prevailing mining regime for ASM, implement policies disruptive to existing patronage structures, and re-evaluate the role of the state in 'orchestrating' sector development. For this, there is an urgent need to move the mining discussion away from how to better capture rents from tax avoidant LSM to the needs of the sector's bottom of the pyramid. Given the emphasis by the current Presidency on extractive-led downstream industrialisation, such a shift in discourse can be anticipated in the near future.

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Knowledge  
Products

# Research Report

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Artisanal and small-scale mining (ASM) has long been a mainstay of Tanzania's rural economy, contributing to the livelihoods of more than three million Tanzanians. ASM is nonetheless yet to realise its full development potential, with the sub-sector continuing to be beset by social, environmental and economic underperformance issues as a result of structural resource and capacity constraints. Like countries such as Ghana, Cameroon and Zimbabwe, foreign investors, often of Chinese origin, are increasingly participating in Tanzania's ASM chains, which bring in much-needed capital, technologies and know-how. Therefore, such investments have the potential to contribute to resolving ASM barriers to upgrading, but could also pose a threat if not properly regulated.

This paper aims to offer new insights into the opportunities and risks associated with leveraging foreign private capital in support of ASM development. It does this by examining (1) the nature and scope of investor participation in Tanzania's ASM, (2) how (well) this participation is regulated and (3) the attendant sustainable and sector development implications. Our analysis reveals how investor participation in Tanzania's ASM sector has evolved in recent years and how such investments have contributed to fulfilling basic livelihoods needs of rural populations.

These investments however have by and large failed to fulfil their transformative potential by forging limited productive linkages with ASM miners. We also observed limited differences between Chinese and other investors in business models and associated impacts, attesting to the sector-wide – rather than investor-specific – nature of these challenges. In light of the ongoing sector reform, this paper highlights a host of critical institutional issues that deserve greater attention if the Tanzanian government is to improve the performance of ASM and leverage the potential of foreign investment in the sub-sector.

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