

Upgrading Tanzania's artisanal and small-scale mining through investor partnerships

Opportunities and challenges

George Schoneveld¹, Maisory Chacha², Maria Njau², Xiaoxue Weng³ and Jesper Jonsson²

Key messages

- Foreign investors are increasingly partnering with ASM operators to access mineral rights and reserves, in a high risk and high cost environment.
- This has led to an upgrading of ASM operations and indirect technology diffusion across mining areas through 'demonstration effects', but this upgrading may disrupt existing benefit sharing arrangements between ASM laborers and pit-owners/license holders.
- Upgrading of ASM, through capital infusion and technology advancement, is also accompanied by high environmental and occupational health and safety risks.
- The constrained capacity of sub-national institutions and lack of cross-institutional coordination are hampering governmental efforts to monitor and improve environmental and occupational health and safety practices of partnerships.
- Policy discussion is needed on the ASM-investor partnership model's benefits and risks, and how best to harness its potential to upgrade the sector, as well as support the sustainable development of rural mining communities.
- Effective institutional coordination among key government institutions, particularly at sub-national level, is urgently needed to reduce the high environmental and labor safety risks posed by mechanized small-scale mines.

Introduction

Artisanal and small-scale mining (ASM) of precious metals and gemstones has long been a mainstay of Tanzania's rural economy (Chachage 1995; Fischer et al. 2009). Although the ASM sector's contributions to national mineral output and foreign exchange earnings are incomparable to those of large-scale mining (LSM) in Tanzania, the sector is estimated to directly employ 680,000 Tanzanians, as opposed to the 8,800 employed in LSM (URT 2011). Given the prediction that every person directly involved in ASM generates four indirect employment opportunities, the ASM sector in Tanzania likely results in direct and indirect employment opportunities for nearly three million. For many Tanzanians, it is the most lucrative accessible source of rural income (Jonsson and Fold 2011).

Despite ASM's positive contributions to rural livelihoods, it has been widely criticized for its poor social and environmental performance. This is attributable to widespread failure to adhere to health and safety standards (Hinton 2005), environmental degradation (Kitula 2006), the use of child labor (HRW 2013), land conflicts (Lange 2011; Carstens and Hilson 2009) and social problems emanating from demographic shifts, and income and employment insecurity (Byceson and Jønsson 2010). Although the laws and regulations that govern the mining sector and its impacts are comparatively well-developed in Tanzania, in practice most ASM operations in the country operate informally, often outside the purview of the state. Since many regulatory agencies lack the necessary resources and incentives to effectively enforce sector regulations, the ASM sector is only minimally confronted by the consequences of its legal non-compliance. Equally, because access to finance and modern production technologies is limited and linkages to LSM are weak, most ASM operations rely on rudimentary and unsustainable production practices, are unable to develop the necessary mining infrastructure,

1 CIFOR Kenya

2 COWI Tanzania

3 International Institute for Environment and Development

and are confronted by poor economic efficiency and recovery rates. As a result, the ASM sector is yet to realize its full development potential.

In contrast to countries such as Ghana and Zimbabwe, Tanzania still lacks a significant medium-scale mining (MSM) sector to help bridge the ASM-LSM divide. However, in recent years Tanzania has witnessed an influx of foreign-owned mining companies that are directly engaging with ASM. The high costs and risks associated with establishing new mining operations, coupled with declining access to mining titles within proven mineral reserves, have encouraged entrepreneurial investors to explore opportunities to partner with ASM operations instead of establishing greenfield operations. This injection of much-needed capital and modern technology has potential to contribute to resolving some of the performance challenges facing the sector.

This brief presents results from a study that critically examined:

1. the dynamics of ASM-investor partnerships
2. the partnerships' contributions to local development and ASM upgrading, as well as impacts on the environment, and
3. how, and how well, these partnerships have been regulated by the Tanzanian government.

The brief concludes with a number of regulatory options that governments facing similar predicaments may wish to consider when seeking to formalize and regulate the impacts of investor partnerships with informal commodity producers.

Methods

Following scoping visits to the regions of Mwanza, Geita, Arusha, Singida, Dodoma, Kilimanjaro, Kigoma, Mbeya, and Katavi, through which 123 private and public-sector key informants were interviewed, four districts were selected for follow-up research, namely Geita (Geita region), Chunya (Mbeya region), Mwanza (Kilimanjaro region), and Mpwapwa (Dodoma region). The first two sites, where five ASM-investor partnerships were analyzed, are well-established ASM gold mining areas, while the latter two sites, where five ASM-investor partnerships were similarly analyzed, are emergent copper mines areas. The study purposely selected sites in two different mineral segments in order to account for the mediating role of sub-sectoral specificities.

At each selected site, a total of 89 key informant interviews were held with investors, local government officials, community leaders, and other actors in the value chain (e.g. brokers/dealers, input suppliers, processors) to identify the sustainable development implications of mining activities, as well as place-specific value chain and political economic dynamics. An additional 155 semi-structured surveys were administered with miners directly participating in four of the ten partnerships; 19 focus group discussions were then held with other key local stakeholder groups, such as youth and women in host communities, with the aim of identifying localized impacts.

Research findings from the four sites were then used to design a follow-up political economy analysis, which involved interviews with nine national-level government departments in Dar-es-Salaam and 13 regional and district-level departments.

Overview of partnerships

The ASM gold sector first began to experience major foreign capital inflows in the mid-to-late 2000s, when investors began to establish leaching plants (particularly in Geita district) to recover gold contained within unused tailings. While such plants created an opportunity for ASM operations to benefit from what were long perceived as waste products of insignificant economic value, they rarely involved partnership or technology transfer arrangements. However, as prices for tailings began to rise, in the context of increasing competition and declining supply, many foreign leaching investors began to explore opportunities to gain more direct control over gold resources, by engaging in mining themselves.

In Tanzania's fledgling ASM copper sector, foreign investors entered primarily as intermediaries. Record global copper prices in the early 2010s resulted in a rush to buy and export copper ores and concentrates from ASM; mostly this involved Chinese buyers with links to the Chinese market. However, as prices began to fall and buyers were confronted by ore quality and quantity issues, by 2014 most buyers had either exited the market or - as with the gold sector - begun to explore opportunities to directly engage in production.

In both sectors, the economic imperative to vertically integrate drove foreign investors to establish partnerships with multiple holders of Primary Mining Licenses (PML) - an ASM license reserved for Tanzanian citizens. While Tanzanian law prohibits foreigners from operating on PMLs in forms other than technical assistance, the majority of investors took over all ASM mining and processing activities within the PML through these partnerships. This typically involved them investing in and employing machinery and practices associated with modern, more mechanized mines. For many of these investors, this approach to accessing and exploiting mineral rights is considered to be less expensive, time-consuming, and bureaucratically complex than establishing new mines following official procedures. Establishing a new mine involves, for example, considerable investments in prospecting, feasibility study(ies), and environmental impact assessment(s), which often consumes in excess of five years before investments in actual extraction can be made. Likewise, in gold mining, few mineral and prospecting rights over established mining areas are even available. Tanzania's five large-scale gold mines control the majority of Tanzania's proven gold reserves; PML holders and holders of prospecting and exploration licenses, typically consisting of a mix of foreigners and urban elite Tanzanians, hold rights over much of what remains. Therefore, accessing proven reserves in Tanzania often requires the engagement of existing license holders.

Mixed impacts on employment, environment, and sector development

In all but one of the ten partnerships with PML holders captured in this study, investors opted not to retain or build on the established organizational structure of ASM operations. ASM typically involve a three-tiered responsibility and profit-sharing system: between the PML holder (responsible for legality issues and overall security); the pit holder (responsible for financing and developing the mine); and the miners (responsible for extraction and processing) (see Figure 1 for a stylized depiction and Bryceson et al. (2014) and Kulindwa et al. (2003) for a more elaborate characterization). Under arrangements like these, ASM miners are essentially shareholders and are able to derive significant gains from a productive mine, but, in the absence of salaries, also bear the costs of underperformance. Under mines operated through PML-investor partnerships on the other hand, a more formalized organizational structure is adopted, where miners are employees and receive a fixed salary (Figure 2). While this provides a more secure income and, in most cases, some secondary benefits, miners are less vested in the performance of the mine and forego the opportunity to derive financial benefits from its profitability. Local communities benefit from investors' reinvestment in mining infrastructure, but, other than employment, communities under this arrangement derive few direct benefits from their land's mineral wealth.

On one hand, because fully mechanized mines are – unlike ASM – capital rather than labor intensive, the take-over of ASM operations by investors not only results in a shift in profit distribution to stakeholders with more capital, it arguably also threatens to reduce the availability of opportunities for the rural population in the long term. On the other hand, with

less than 10% of Tanzania's 30,000+ PMLs estimated to be operational, investors also have a positive net effect on rural off-farm employment generation, by reactivating dormant or undeveloped mines typically held for speculative purposes. This, however, seems to depend on the region; for example, this reactivation effect was not strong in Geita and Chunya where many of the PMLs absorbed by investors were already active ASM gold mines, while copper mining areas benefited more, as a large proportion of the PMLs were undeveloped.

Skills development has been weak across most of the mines, as the vast majority of locally accessible employment options are of a menial nature, with more technical positions generally reserved for expatriate staff. Only one of the mines instituted a training program; yet this mine also alleged that once employees completed the training, they left for better paid jobs elsewhere. This reveals the weak economic rationale for investors to continue such programs. None of the mines developed collaborative relations with other ASM operations that involve technology transfer or capital provisioning. As a result, PML-investor partnerships are yet to generate direct positive technological spillover effects, beyond the 'demonstration effect'. Nevertheless, investors have made key sectoral-level contributions through capital-intensive technologies and value addition in modern processing facilities. In addition, local ASM operators who have upgraded their operations noted that the existence of foreign-PML mines with advanced technology was crucial in demonstrating the profitability of the new business model. While occupational safety and health and environmental performance and compliance issues plague many investors' partnerships, due to the adoption of more modern extraction and processing practices they do tend to outperform most ASM operations in this respect. This relates, for example, to higher adoption

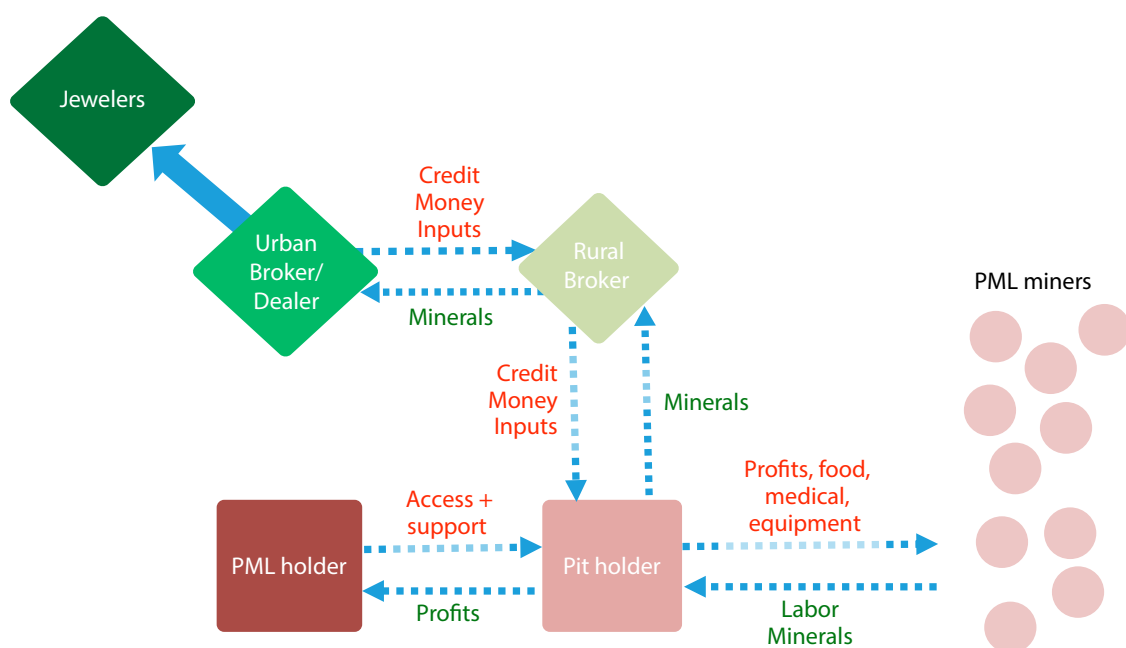


Figure 1. The traditional ASM organizational model

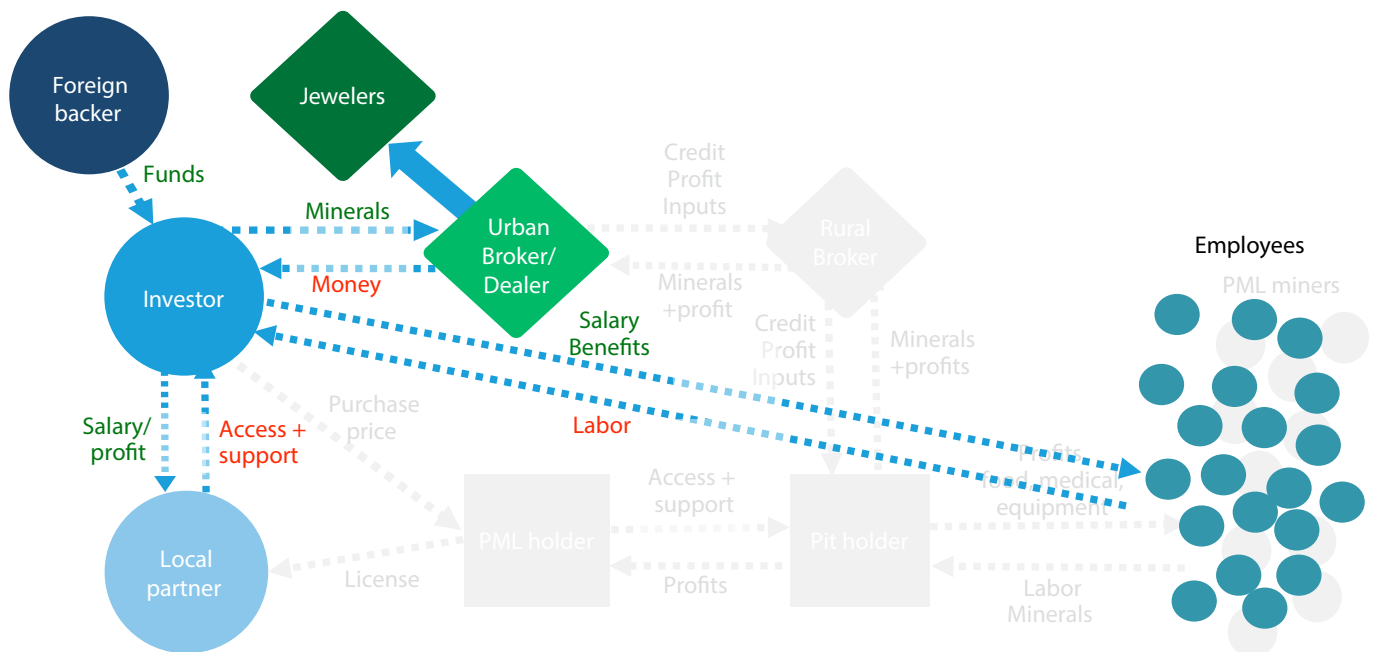


Figure 2. ASM-investor partnership model

rates of technologies that minimize risk of cyanide and mercury contaminations, as well as more efficient extraction techniques that reduce dependency on open-pit mining, which is more likely to involve deforestation, loss of soil fertility, and air pollution than underground mining. Likewise, in contrast to most ASM operations, the majority of investors also contribute to community development activities as part of their corporate social responsibility.

Regulatory dynamics and challenges

Analysis of how, and how well, PML-investor partnerships have been regulated has revealed a number of (predominantly institutional) challenges. These deserve greater attention, if the public sector is to play a more meaningful role in leveraging these partnerships to enhance the social, environmental, and economic performance of ASM.

Local Government Authorities (LGA) 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 unable to achieve their productive potential due to capacity and resource constraints, most government stakeholders view the mechanization of PMLs by foreign investors as an encouraging development that helps stimulate the ASM - and thus the local - economy. Foreign investor mining PMLs are therefore largely condoned, with no evidence of any state actors forcing investors to comply with prevailing mining regulations, or to upgrade the PML license to a Mining License (ML) that would enable investors to operate legally. It is generally feared that doing so will deter investment, given the costs and time of establishing a mine under an ML.

Vested interests also play into this. For example, a number of LGA and mining officials familiar with local mining operations and mineral deposits were found to assist investors – typically in an unofficial capacity - in identifying and negotiating partnership arrangements. Similarly, many investors, at least initially, wrongly assumed that by operating under the veil of a PML, they too could benefit from the de facto regulatory exemptions that apply to PMLs; for example, by hiring labor informally, neglecting to upgrade mining licenses, and failing to adhere to environmental regulations, tax, migration, and occupational health and safety regulations. Many of the investors alleged that this made them especially vulnerable to rent-seeking behavior by regulatory authorities. Where investors become an important target for rent-seeking, certain regulatory authorities arguably become compromised in the fulfilment of their mandates, and in turn become vested in investors continuing to operate in an extra-legal capacity.

Weak horizontal and vertical coordination within government also affects how well PML-investor partnerships are regulated in relation to environmental and social impacts. Stakeholders that are typically more familiar with mining operations on the ground (e.g. Ministry of Minerals (MM) and LGAs) are often disinclined to inform authorities such as National Environment Management Council (NEMC) and the Occupational Safety and Health Authority (OSHA), who are often **understaffed and underfunded**, about problematic and improperly licensed mines.¹ This severely

¹ The government recently announced a sharp increase in the appointment of environmental inspectors (from 60 to 435), drawing on existing government staff from NEMC, LGAs, and other departments. The appointment empowers inspectors to stop or fine an operation for non-compliance, although it remains to be seen whether new inspectors will be availed with the necessary resources to undertake monitoring and enforcement work.

Table 1. Options to regulate ASM-investor partnerships

	Option 1 Business as usual	Option 2 Tougher enforcement	Option 3 Adapt existing regulations	Option 4 Alternative business models
Objective	<ul style="list-style-type: none"> Allow the situation to evolve organically 	<ul style="list-style-type: none"> Remedy negative impacts through formalization 	<ul style="list-style-type: none"> Develop new regulations to accommodate the needs of MSM 	<ul style="list-style-type: none"> Promote business models that integrate rather than displace ASM activities
Requirements	<ul style="list-style-type: none"> Avoid disruptive policies and regulations 	<ul style="list-style-type: none"> Investment in government enforcement capacity Address internal politics and disincentives 	<ul style="list-style-type: none"> Re-evaluation of existing regulations and government mandates Improved dialogue between government and MSM 	<ul style="list-style-type: none"> More involvement of CSOs in brokering multi-stakeholder dialogues Develop adaptive capacities and learning amongst investors, ASM, CSOs, and government
Risks	<ul style="list-style-type: none"> Negative impacts remain unresolved Concentration of mineral rights by allowing investors to accumulate PMLs 	<ul style="list-style-type: none"> Investors stop investing due to costs Investors abandon their investments Widening of informality gap between investors and ASM 	<ul style="list-style-type: none"> Concentration of mineral rights by allowing investors to accumulate PMLs Widening of informality gap between investors and ASM 	<ul style="list-style-type: none"> Investors abandon their investments Power imbalances if ASM enters into one-sided contract Opportunistic trading practices (e.g. side-selling) Loss of value addition
Opportunities	<ul style="list-style-type: none"> Predictability Investor confidence Mineral output growth 	<ul style="list-style-type: none"> Improved labor conditions, environmental performance, and public revenues 	<ul style="list-style-type: none"> Investor confidence Mineral output growth Improved social and environmental performance 	<ul style="list-style-type: none"> Upgrading of ASM Develop domestic mining capacity Profits internalized

constrains the government’s capacity to monitor environmental and occupational safety risks associated with mechanized mines. This can partly be seen as a conflict between a development and revenue generation agenda on the one hand, and a regulatory agenda related to environmental and social compliance on the other. This is typically reinforced by the **(misaligned) key performance indicators (KPI)** that staff within such institutions are evaluated on. In addition, even though LGAs have dedicated staff members tasked to monitor social and environmental compliance (such as the District Environmental Management Officers), because these staff are typically required to report through LGA hierarchies that are inclined to prioritize local development agendas, effective communication with relevant sectoral counterparts (such as NEMC and OSHA) is, in practice, often undermined by local politics. While the former Tanzania Minerals Audit Agency had an explicitly cross-sectoral mandate, due to their KPIs being focused on revenue generation, they tended to focus their auditing activities on larger mines with the potential to recover mineral royalties.

Because of the risk and costs of non-compliance, a number of the sampled investors were beginning to invest in the formalization of their operations (e.g. workplace registration, upgrading of mining licenses and environmental permitting) to safeguard their increasing sunk investments. Such formalization fundamentally alters how investors are regulated, with central government authorities from agencies such as NEMC and OSHA taking over regulatory

functions. It is generally claimed that this **centralization of regulatory enforcement** is necessary for (foreign) investments, because sub-national authorities lack the necessary capacity to effectively regulate such projects, and are more likely to be compromised by local politics. While there is some credence to these views, centralization could threaten to **disempower sub-national authorities and undermine the ability of important regulatory authorities** to develop the constructive day-to-day working relations needed to effectively support investors in improving their social and environmental performance.

Recommendations

Our research demonstrates that PML-investor partnerships are increasingly creating mechanized small-scale mines that, employing more advanced technologies, are proving more productive than mines in Tanzania’s ASM sector have previously been. If properly leveraged, such investment could contribute to upgrading the ASM sector in Tanzania, addressing the financing gap, and potentially elevating some small-scale operations to MSM. Yet it is also accompanied by legal ambiguity and new environmental and occupational safety and health challenges. To more effectively harness its potential to contribute to sustainable development and ASM upgrading, we highlight four key regulatory options that the Tanzanian government may wish to consider moving forward. Table 1 summarizes the objectives of the four approaches, the regulatory and institutional requirements associated with their implementation, and the opportunities and

risks for the sustainable development of the Tanzanian mining sector. These options range from maintaining the status quo of condoning ASM-investor partnerships to encouraging investors to adopt business models that integrate rather than displace ASM; for example, through exclusive ore off-take agreements in return for technical support, finance, and inputs.

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References

- Bryceson DF and Jønsson JB. 2010. Gold digging careers in rural East Africa: Small-scale miners' livelihood choices. *World Development* 38(3):379–392.
- Bryceson DF, Fisher E, Jønsson JB and Mwaipopo R, eds. 2014. *Mining and Social Transformation in Africa: Mineralizing and Democratizing Trends in Artisanal Production*. London: Routledge.
- Carstens J and Hilson G. 2009. Mining and grievance in rural Tanzania. *International Development Planning Review* 31(3):301–326.
- Chachage CSL. 1995. *The meek shall inherit the Earth but not the mining rights: Mining and accumulation in Tanzania*. In Gibbon P, ed. *Liberalised Development in Tanzania*. Uppsala: Reprocentralen HSC.
- Fisher E, Mwaipopo R, Mutagwaba W, Nyange D and Yaron G. 2009. The ladder that sends us to wealth: Artisanal mining and poverty reduction in Tanzania. *Resources Policy* 34(1):1–7.
- Hinton J. 2005. *Communities and small-scale mining: An integrated review for development planning*. Washington, DC: The World Bank.
- [HRW] Human Rights Watch. 2013. *Toxic toil: Child labor and mercury exposure in Tanzania's small-scale gold mines*. Washington DC: HRW.
- Jønsson JB and Fold N. 2011. Mining 'from below': Taking Africa's artisanal miners seriously. *Geography Compass* 5(7):479–93.
- Kitula AGN. 2006. The environmental and socio-economic impacts of mining on local livelihoods in Tanzania: A case study of Geita district. *Journal of Cleaner Production* 14(3–4):405–414.
- Kulindwa K, Mashindano O, Shechambo F and Sosovele H. 2003. *Mining for Sustainable Development in Tanzania*. Dar es Salaam: Dar es Salaam University Press.
- Lange S. 2011. Gold and governance: Legal injustices and lost opportunities in Tanzania. *African Affairs* 110(439):233–252.
- [URT] United Republic of Tanzania. 2011. *Draft final report on baseline survey on artisanal and small-scale mining (ASM) activities and preparation of an ASM database*. Sustainable Management of Mineral Resources Project (SMMRP). Washington DC: World Bank.



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