

CLIMBING THE INCLUSION LADDER: ARTISANAL GOLD MINING IN TANZANIA

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ABSTRACT

Tanzania faces significant development challenges. While gross domestic product growth remains relatively impressive, many sectors are growing off a small base. Both the longevity of the acceleration and the quality of the growth are in question. Tanzania's educational outcomes remain poor, and young people are less likely to find good quality employment. A fast-growing population requires an expansion of employment opportunities, and it is not clear that these are being created. A handful of companies provide the majority of tax revenue, rendering the government reliant on foreign aid in addition to taxation. President John Magufuli's government therefore needs to broaden the tax base and diversify the economy without undermining current foreign exchange and tax earnings. Tanzania is endowed with extensive mineral resources (and recently discovered natural gas), which could mobilise resources for development, provided the sector is well governed. This paper examines the artisanal gold mining sector as an important employer and potential revenue generator. It also explores the negative social and environmental externalities associated with the sector. The barriers to entry for artisanal miners to formalise should be lowered, although this will not guarantee development. Most importantly, the government – in partnership with development organisations and the private sector – should roll out and ensure the uptake of inexpensive technologies (such as retorts) that will reduce negative externalities and increase potential positive economic spillover effects.

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ABBREVIATIONS AND ACRONYMS

AMV	Africa Mining Vision
ASM	artisanal and small-scale mining
CCM	Chama Cha Mapinduzi (Party of the Revolution)
GDP	gross domestic product
ICCPR	International Covenant on Civil and Political Rights
LSM	large-scale mining
PML	primary mining licence
PPL	primary prospecting licence
REDD	Reducing Emissions from Deforestation and Forest Degradation
WEF	World Economic Forum

INTRODUCTION

One of the key pillars of the 2009 Africa Mining Vision (AMV) is a '[mining] sector that harnesses the potential of artisanal and small-scale mining to stimulate local/national entrepreneurship, improve livelihoods and advance integrated rural, social and economic development'.¹ Artisanal mining is defined as low-tech, labour-intensive mineral extraction and processing, and is a common livelihood pursuit in sub-Saharan Africa. However, despite four decades of being on the international development agenda, 'the sector has yet to capture the attention of donor agencies, NGOs [non-governmental organisations] and host governments'.²

Despite its name, this is not a small sector. It supplies an estimated 10% of the world's gold,³ and provides between 13 and 20 million jobs worldwide. In Africa alone, approximately 3.7 million people are directly engaged in the sector, with an associated 30 million dependents, and it produces roughly 18% of the continent's gold, as well as a variety of other minerals.⁴ Estimates from Tanzania suggest that at least 1.5 million people are directly employed in artisanal mining, with 9 million dependents. The nearest competitor in terms of size is Ghana, with 1.1 million directly employed.⁵ There is a relatively strong consensus in the literature that it is poverty that tends to drive people towards artisanal mining, rather than the hope to 'strike it rich' quickly.⁶ One would therefore expect development support for the sector to feature prominently in countries' poverty alleviation strategies, especially given its current and future potential benefits. For instance, respondents estimated that artisanal miners could earn up to 10 times more in the sector than in alternative economic activities, and the income is more stable.⁷ This income is invested in a range of other sectors, from taxi services to farming. Studies suggest that incomes that raise 'the consumption levels of rural households might have substantial multiplier effects, because they are more likely to be spent on domestically produced

1 AU, 'Africa Mining Vision', February 2009, http://www.africaminingvision.org/amv_resources/AMV/Africa_Mining_Vision_English.pdf, accessed 5 May 2017.

2 Hilson G & J McQuilken, 'Four decades of support for artisanal and small-scale mining in sub-Saharan Africa: A critical review', *The Extractive Industries and Society*, 1, 1, 2014, pp. 104–118.

3 UNECA (UN Economic Commission for Africa), *Minerals and Africa's Development: The International Study Group Report on Africa's Mineral Regimes*. Addis Ababa: UNECA & AU, 2011.

4 AU, *op. cit.*, p. 26.

5 Data is taken from Hilson G & J McQuilken, *op. cit.*, p. 105.

6 Bryceson D & S Geenen, 'Artisanal frontier mining of gold in Africa: Labour transformation in Tanzania and the Democratic Republic of Congo', *African Affairs*, 2016, pp. 1–22.

7 Interviews conducted during fieldwork in Tanzania in April 2016. This kind of sentiment also appears in almost all academic research work on artisanal mining in Tanzania. See, for example, Fisher E, 'Occupying the margins: Labour integration and social exclusion in artisanal mining in Tanzania', *Development and Change*, 38, 4, 2007, p. 752; Jönsson JB & N Fold, 'Mining "from below": Taking Africa's artisanal miners seriously', *Geography Compass*, 5, 7, 2011, pp. 481–482.

goods'.⁸ Revenue generated from the artisanal mining sector provides opportunities for both taxation and economic diversification.

The AMV recognises that there are complex challenges associated with including artisanal mining in attempts to optimise a country's resource endowments. The UN Economic Commission for Africa's explanation of the sector's absence in poverty alleviation strategies is that negative perceptions of the industry tend to undermine such efforts. Artisanal and small-scale mining (ASM) works from a low capital base, is hardly mechanised, and is often hazardous to labourers and the environment. Yet these are sound reasons to afford it primacy in development efforts. There is no reason why artisanal mining cannot serve as a stepping stone out of poverty, with the correct policies and levels of support. It could even become a key rung on the ladder towards inclusive development.

This paper aims to provide practical policy suggestions towards alleviating the negative externalities associated with artisanal and small-scale gold mining⁹ in Tanzania, and harnessing the potential positive spillovers. Negative externalities are defined as the divergence between private returns and social (including environmental) costs, and may include the impact of mercury use, for instance. Positive spillovers are conversely defined as the divergence between private costs and social returns. Reinvesting revenue into other economic activities, for instance, contributes to higher aggregate employment and production.

It begins by providing an overview of Tanzania's political economy landscape to locate the challenge of artisanal mining within the broader ambit of related development challenges. It then provides a brief history and examination of current artisanal mining practices in Tanzania, after which it highlights the institutional context in which artisanal miners operate. Finally, it explores how current policies could be adapted, or new policies implemented, to reduce negative externalities and amplify positive spillovers.

POLITICAL ECONOMY LANDSCAPE

In May 2016 *The Economist* ran a story on Tanzania called 'Government by Gesture'.¹⁰ The new president, John Magufuli, opened Parliament after his 2015 election victory with a reiteration of his campaign promise of free secondary education for all Tanzanians. Disconcertingly, in 2016 his government 'started expelling foreign workers without

8 Gupta S, Pattillo A & S Wagh, 'Effect of remittances on poverty and financial development in sub-Saharan Africa', *World Development*, 37, 1, 2009, pp. 104–115.

9 Artisanal mining is technically informal, and sometimes illegal. Small-scale mining, at least in the Tanzanian case, is formalised through the acquisition of a primary mining licence or a mining licence. The terms are used in this way throughout the text.

10 *The Economist*, 'Government by gesture: A president who looks good but governs impulsively', 28 May 2016, <http://www.economist.com/news/middle-east-and-africa/21699470-president-who-looks-good-governs-impulsively-government-gesture>, accessed 4 July 2016.

proper permits, including thousands of Kenyan teachers'.¹¹ Several interviewees expressed disquiet over the president's propensity for impulsiveness. Within his ruling party, the Chama Cha Mapinduzi ('Party of the Revolution', or CCM), Magufuli is relatively insulated from the effects of rooting out corruption, provided he acts within the parameters of goodwill afforded him by 'CCM grandees such as Kikwete [the former president], who remains the party's chairman',¹² and the rest of the party elite. Firing people on the spot and purging ghost workers from the bloated public payroll may be good politics – and necessary for transformation – but such actions are not enough to lift Tanzania onto a sustainable development trajectory.¹³ Interviewees expressed their concern that only politically expedient 'surface' corruption would be addressed while deeper structural malfunction would be left unreformed. Magufuli has remained silent, for instance, on the 2015 Zanzibar election issue, where almost all accounts suggest that the opposition party had won.¹⁴ The CCM called for a re-run in which the opposition refused to participate.

The perception that Magufuli will only address superficial corruption may undermine his credibility in the long run, especially if anti-corruption drives are not supplemented by a bold economic vision.¹⁵ Moreover, the relative peace and stability that Tanzania has enjoyed since independence should be a foundation for inclusive growth. Without institutional reform, however, particularly in terms of encouraging private sector growth and investment, the country will not realise its potential prosperity.

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POPULATION

Economists are partial to the idea of a demographic dividend – the presence of a large and growing market of potential consumers and producers. But Marx had a point in noting the contradiction of workers in British factories being unable to afford the very products they were producing. Tanzania faces a similar but even deeper problem. Its population is growing at a blistering pace but the nature of its economic growth is such that it will lack the capacity to absorb a future over-supply of unskilled labour. It is not just that workers will be unable to afford manufactured goods; there will be very few jobs available

11 *Ibid.*

12 Anyimadu A, 'Politics and Development in Tanzania: Shifting the Status Quo', Chatham House Research Paper, 18 March 2016, p. 7, <https://www.chathamhouse.org/sites/files/chathamhouse/publications/2016-03-politics-development-tanzania-anyimadu.pdf>, accessed 4 July 2016.

13 Pilling D & J Aglionby, 'Tanzania's new president shakes up east Africa's "sleeping giant"', *Financial Times*, 27 June 2016, <http://www.ft.com/cms/s/0/0eae9b54-3c5c-11e6-9f2c-36b487ebd80a.html#axzz4DQbSWROV>, accessed 4 July 2016.

14 For an in-depth treatment of the Zanzibar issue and an overview of Tanzania's post-election political economy situation, see Anyimadu A, *op. cit.*

15 Cheeseman N, 'Deconstructing the Magufuli miracle in Tanzania', *Democracy in Africa*, 16 October 2016, <http://democracyinafrica.org/deconstructing-the-magufuli-miracle-in-tanzania/>, accessed 19 October 2016.

The importance of support for small-scale mining as a key pathway to poverty alleviation cannot be overemphasised, as opportunities in the formal sector will remain elusive for some time

in manufacturing at all. This is significant because manufacturing is crucial to setting any developing country onto a sustainable development path.¹⁶

The UN's 2015 demographic modelling found that Tanzania's current population of 53 million was likely to reach 299 million by 2100, a fivefold increase that would make the country one of the 10 largest in the world.¹⁷ By contrast, Kenya's population is currently 46 million and will reach only 157 million by 2100. Such growth in Tanzania can only be construed as a dividend if the supply of labour it provides is absorbed by a growing economy. This is unlikely to be the case, as the current gross domestic product (GDP) growth is off a low base and not labour-intensive. Currently 45.2% of the population are under the age of 15, 57% of the voters in the 2015 elections were under the age of 35,¹⁸ and youth unemployment is arguably the biggest socio-economic challenge. The government recognises that sustainable growth is hard to achieve under the circumstances, and the CCM understands that current and future employment provision is crucial to maintaining political support among the younger generation. To be successful, there are major challenges – outlined below – that the government must overcome. In this context the importance of support for small-scale mining as a key pathway to poverty alleviation cannot be overemphasised, as opportunities in the formal sector will remain elusive for some time.

EDUCATION

Tanzania met the Millennium Development Goal 2 of achieving universal primary education five years ahead of schedule, in 2010. It has also 'made the most progress in Africa on primary education over the last ten years'.¹⁹ There is, however, some distance to go if educational outcomes are to equip Tanzanians with the skills to flourish in a competitive global market. Upper secondary level school enrolment, for instance, is only at 4%, and lower secondary is at 39%.²⁰ Besides, enrolment does not ensure competent numeracy and literacy. A 2014 study found that 'many children that attend school are

16 Rodrik D, 'An African growth miracle?', *Journal of African Economies*, 2016, pp. 1–18.

17 UN, Department of Economic and Social Affairs, Population Division, *World Population Prospects: The 2015 Revision, Key Findings and Advance Tables*, 2015, p. 24, https://esa.un.org/unpd/wpp/publications/files/key_findings_wpp_2015.pdf, accessed 4 July 2016.

18 Anyimadu A, *op. cit.*, p. 18.

19 Lee L, '21st century progress in Africa: Achieving MDG2 in Tanzania', Impatient Optimists, Bill & Melinda Gates Foundation, 4 November 2013, <http://www.impatientoptimists.org/Posts/2013/10/21st-Century-Progress-in-Africa-Achieving-MDG-2-in-Tanzania#.V3uKG1c7o9E>, accessed 5 July 2016.

20 World Bank Group, 'Tanzania: Engaging the Private Sector in Education', SABER (Systems Approach for Better Education Results) Country Report, 2015, http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2015/10/13/090224b08313e881/1_0/Rendred/PDF/SABER0engaging0port000Tanzania02015.pdf, accessed 27 July 2016.

not learning basic skills within the first few years of education'.²¹ A lack of proficiency in English literacy is particularly problematic, as it increases barriers to entry in the jobs market. Literacy is not improving despite higher enrolment and completion rates at the primary level. Exacerbating this is the fact that Tanzanian graduates are ranked as the second-least employable in East Africa, 'with 61 per cent assessed as having no basic job market skills, compared to 51 per cent of Kenyan graduates'.²² However, African Development Bank research economist John Anyanwu found that, as of 2010, Tanzania had a youth employment-to-population ratio (the proportion of employed youth, aged 15 to 24 years) above 60%, an outlier in sub-Saharan Africa (where the average is 36.8%). This was despite a low employment ratio relative to income levels between 1991 and 2010 (which follows the pattern of most natural resource-wealthy economies).²³ At first glance this contradicts the view that youth unemployment is a rising challenge. However, it appears that this figure reflects employment in artisanal mining, with very low corresponding incomes.²⁴

In this context, until educational outcomes improve it is crucial that labour-absorptive economic activities for a low-skilled labour force are supported through appropriate policy and governance mechanisms. While parents employed in artisanal mining, for instance, may not be equipped to help their children with homework – an important determinant of education success – some source of income is crucial to avoid the long-term effects of child poverty.²⁵ Beyond mere employment, government policies to support artisanal mining should thus include an adult education component that equips parents to help their children with schoolwork. The positive spillovers of adult education are extensive and a necessary condition for attaining universal upward social mobility.²⁶

DEVELOPMENT AND THE ECONOMY

One of the best indications of a country's *development* progress (as opposed to mere economic growth) is whether its infant mortality rate has improved over time. Infant mortality is typically concentrated in the lowest income quintiles and is a sensitive measure of numerous other factors that are often difficult to measure accurately and

21 Uwezo, 'Are Our Children Learning? Literacy and Numeracy Across East Africa 2013', 2014, <http://www.uwezo.net/wp-content/uploads/2012/08/2013-Annual-Report-Final-Web-version.pdf>, accessed 5 July 2016.

22 Anyimadu A, *op. cit.*, p. 20.

23 Anyanwu JC, 'Characteristics and macroeconomic determinants of youth employment in Africa', *African Development Review*, 25, 2, 2013, pp. 107–129.

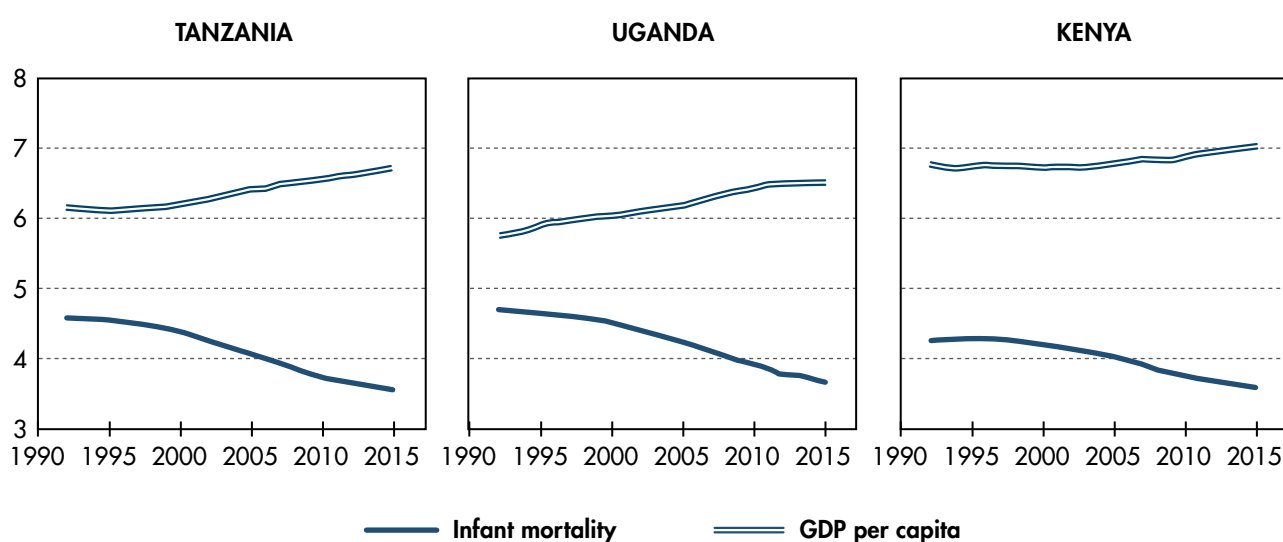
24 While incomes are low in artisanal mining, it is generally accepted in the literature, and respondents confirmed this, that incomes in the sector are higher than can be attained elsewhere.

25 Harper C & R Marcus, 'Mortgaging Africa's future: The long-term cost of child poverty', *Development*, 43, S1, 2000, pp. 65–72.

26 Blanden J, 'Cross-country rankings in intergenerational mobility: A comparison of approaches from economics and sociology', *Journal of Economic Surveys*, 27, 1, 2013, pp. 38–73.

reliably. For instance, access to clean water and sanitation; indoor air quality; female education and literacy; prenatal and neonatal health services; caloric intake; disease; and income are all difficult to measure among the poor, but are well captured in infant and child mortality rates – the lower the rate, the higher the access to the abovementioned services is likely to be. Figure 1 (using a logarithmic scale) indicates the relationship between infant mortality and GDP per capita from 1992–2015 in three comparable East African countries: Tanzania, Uganda and Kenya. Hypothetically, development indicators should improve as a country’s wealth grows.²⁷

FIGURE 1 INFANT MORTALITY VS. GDP PER CAPITA GROWTH



Source: World Bank, ‘World development indicators’, <http://databank.worldbank.org/data/reports.aspx?source=world-development-indicators#>, accessed 20 October 2016

Tanzania’s infant mortality rate declined from 99 per 1 000 live births in 1992 to 35 per 1 000 live births in 2015. Improved outcomes such as these are also attributable to exogenous factors such as global technological health improvements rather than only to endogenous factors such as economic growth. Nonetheless, Tanzania has made remarkable progress in terms of human development over the last 25 years in conjunction with its economic growth. GDP per capita has nearly doubled since 1992, from a low base of \$475 in that year to \$842 in 2015. Due to relative peace and stability (an enduring legacy

27 While infant mortality does reliably capture the effects of poverty, GDP per capita tells us something about wealth creation but not about its distribution. Inequality remains a problem in all three countries despite aggregate GDP per capita growth.

of Julius Nyerere's early post-colonial leadership), this growth is a linear upward trend. By way of contrast, Kenya's GDP per capita was \$875 in 1992, dipped to \$848 in 1994, and then climbed steadily upwards to reach \$1,133 by 2015. Uganda's infant mortality rate was 107 per 1 000 live births in 1992, dropping to 38 by 2015, while its GDP per capita grew from \$309.69 in 1992 to \$673 in 2015.

If Tanzania is to continue making economic and social progress, and defend the gains it has made thus far, sustained, inclusive growth is necessary. In the context of a globally stagnating economy this will require a highly competitive and attractive investment landscape. Investment tends to precede economic growth, and attracting it depends on initial conditions being met, most important of which are a private sector-friendly business environment and high-quality educational outcomes across a broad swathe of society.²⁸ Unfortunately, consensus is relatively strong that Kenya and Uganda both have more private sector-friendly investment policies than Tanzania, along with better educational outcomes.²⁹

Without private sector growth and integration into the economy, improvements to human welfare are unlikely to be achieved. However, private large-scale mining (LSM) or oil extraction, if not used as levers to diversify the economy, can prove an exception to this general norm. Foreign private firms often extract oil and minerals, making large profits abroad and enriching local elites and their inner patronage circles, at the expense of ordinary citizens. Those elites then tend to use that wealth to suppress political dissent or make side payments to co-opt potential opposition. This is one manifestation of the resource curse – in weakly governed states, resource wealth tends to strengthen the state and weaken the governed citizenry.³⁰ In Tanzania one of the criticisms levelled at the country and large donors such as the World Bank is that large foreign mining interests are encouraged while artisanal miners, who have been operating since long before private capital arrived, are marginalised.³¹

Private LSM can crowd out artisanal mining if not managed properly, and create intractable conflicts between corporates and artisanal miners. Large tracts of land that were previously mined informally under customary rights may, for instance, be allocated to foreign corporates. This creates tension between formal and informal mining, in part because the state does not have the capacity or the technology to manage land rights effectively – there is no centralised database of land and mineral rights allocations. There is a more general risk as well that LSM will become an enclave economy in Tanzania, disconnected from other parts of the economy. One of the ways in which this risk can be mitigated is to create

28 Rodrik D, 'Getting interventions right: How South Korea and Taiwan grew rich', *Economic Policy*, 10, 20, 1995, pp. 53–107.

29 Anyimadu A, *op. cit.*

30 Robinson J, Torvik R & T Verdier, 'Political foundations of the resource curse', *Journal of Development Economics*, 79, 2, 2006, pp. 447–468.

31 Chachage CSL, '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: Institute for African Studies, 1995, pp. 37–108.

Weak and ineffective institutions pose potential risks to Tanzania's relative peace and stability, especially as expectations of broad-based resource wealth accrual abound

synergies between informal and formal mining. Corporates could allocate parts of their allocated rights, for instance, to small-scale mining, or agree to source foodstuffs and other local content from the communities that have sprung up in artisanal mining hotspots.³²

Tanzania has been spared the 'curse' of resource wealth because LSM is relatively new, and mineral production contributes relatively little to overall GDP (5%). However, minerals do account for a high proportion of exports (33%), making the country highly dependent on them for attracting foreign exchange. The extractive industries are weakly governed,³³ as the examination of political and economic institutions below demonstrates. Weak and ineffective institutions pose potential risks to Tanzania's relative peace and stability, especially as expectations of broad-based resource wealth accrual abound. Unmanaged and unmet expectations, coupled with growing youth unemployment, constitute risk factors. Another risk is that the potential dynamism of the private sector will be lost if investment, especially in non-resource sectors, is not encouraged.

DOING BUSINESS

Credible property rights protection is a universal requirement for private sector growth. This has implications for artisanal mining, as miners are more likely to invest in sustaining their businesses and reducing negative externalities if security of tenure is stronger and they are not treated as disruptive illegal operators. The general economic wisdom is: 'Without property rights, individuals will not have the incentive to invest in physical or human capital or adopt more efficient technologies.'³⁴ More broad-based property rights for artisanal gold miners could therefore improve efficiency and reduce the extent of the illicit market at work in Tanzania's artisanal gold mining sector.³⁵

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- 32 See Geipel J, James H & E Nickerson, 'The Relationship Between Local Procurement Strategies of Mining Companies and Their Regulatory Environments: A Comparison of South Africa and Namibia', Mining Shared Value, February 2017, <https://static1.squarespace.com/static/54d667e5e4b05b179814c788/t/58b6f689d1758ecaad9ab5cc/1488385740461/MSV-EWB-CIRDI-Local-Procurement-Regulation-SA-Namibia-Feb17-FINAL.pdf>, accessed 5 May 2017.
- 33 Natural Resource Governance Institute, 'Tanzania's performance on the Resource Governance Index', <http://www.resourcegovernance.org/our-work/country/tanzania>, accessed 20 October 2016.
- 34 Acemoglu D, Johnson S & JA Robinson, 'Institutions as a fundamental cause of long-run growth', in Aghion P & SN Durlauf (eds), *Handbook of Economic Growth*, Vol. 1, Part A. Amsterdam: Elsevier North-Holland, 2005, pp. 385–472.
- 35 There is of course a danger that this would limit the options available to artisanal miners, who currently benefit from being able to move from one informal site to another in search of greener pastures. Another risk is that only those who are politically well connected would gain access to such rights, which would create unhealthy power dynamics.

It is increasingly recognised, however, not least by the likes of economic historian Douglass North³⁶ and economist Daron Acemoglu,³⁷ that property rights protection cannot merely be imposed by external actors to mimic ‘best practice’. If policy recommendations are incompatible with the social systems – beliefs, rules, norms and cultures – that incentivise regular political behaviour³⁸ they will not gain traction. If distributing property rights is a threat to order (however undesirable that order might be in the eyes of development practitioners), the policy suggestion may simply be incommensurate with the distribution of political power. The question for Tanzania, therefore, is whether a broader distribution of secure property rights is politically palatable or realistic, and whether this would truly serve artisanal miners best.

The World Economic Forum (WEF) attributes a 20% weighting to property rights protection under ‘Public institutions’ (which carries a 25% rating overall) in its Global Competitiveness Index. The [2015 Africa Competitiveness Report](#) specifically notes that land reforms should be instituted that ‘clearly define property rights, ensure the security of land tenure, and enable land to be used as collateral’.³⁹ On this score, derived from the 2016/17 questionnaire,⁴⁰ Tanzania ranks 99th out of 138 countries worldwide. Kenya ranks 63rd and Uganda 90th.

Extending property rights more broadly is unlikely to constitute a political threat to the ruling coalition in Tanzania, and would likely win it even more popularity than it enjoys at present. But such rights should be formulated and implemented in a way that reflects local realities and genuinely serves the interests of artisanal miners.

In terms of overall global competitiveness in 2016/17, Tanzania ranks 116th, an improvement from 121st in 2015/16. Kenya is in 96th position, down from 90th the year before. Uganda is 113th, improving from 122nd. In terms of attractiveness for private sector investment, it remains difficult to start a formal business in Tanzania. The informal sector is, however, flourishing, and entrepreneurial activity is visible all over the country. Unfortunately, much of this is trade in charcoal, which has health and environmental ramifications. Policy efforts to formalise all businesses, where appropriate, could provide socio-economic gains for Tanzania.

36 North DC, Wallis JJ & BR Weingast, *Violence and Social Orders: A Conceptual Framework for Interpreting Recorded Human History*. Cambridge, MA: Cambridge University Press, 2009.

37 Acemoglu D & JA Robinson, ‘Economics versus politics: Pitfalls of policy advice’, *Journal of Economic Perspectives*, 27, 2, 2013, pp. 173–192.

38 This definition of institutions is taken from Greif A, *Institutions and the Path to the Modern Economy: Lessons from Medieval Trade*. New York: Cambridge University Press, 2006.

39 WEF (World Economic Forum), *Africa Competitiveness Report 2015*, http://www3.weforum.org/docs/WEF_ACR_2015/Africa_Competitiveness_Report_2015.pdf accessed 19 July 2016.

40 WEF, *The Global Competitiveness Report 2016–17*, http://www3.weforum.org/docs/GCR2016-2017/05FullReport/TheGlobalCompetitivenessReport2016-2017_FINAL.pdf, accessed 5 May 2017.

The World Bank's *Doing Business 2016* report 'sheds light on how easy or how difficult it is for a local entrepreneur to open and run a small to medium-size business when complying with relevant regulations'.⁴¹ Unfortunately, the index does not consider other variables that are important for running a business, such as proximity to large markets and the quality of infrastructure. Nonetheless, as in the economic competitiveness rankings, Tanzania does not perform well when compared to its neighbours in the region or overall. In 2017 it ranks 132nd in the world (out of 190 countries), beaten by Botswana (71st), South Africa (74th), Kenya (92nd) and Uganda (115th).⁴²

TABLE 1 REGIONAL COMPARISON OF POLITICAL AND ECONOMIC COMPETITIVENESS INDICATORS

2016/17	Global Competitiveness (WEF, out of 138)	Property Rights Protection (WEF, out of 138)	Ease of Doing Business (World Bank, out of 190)	Civil Liberty (Freedom House, rank 1–7)
Tanzania	116	99	132	3.5
Uganda	113	90	115	5.5
Kenya	96	63	92	4.0

Source: WEF, *The Global Competitiveness Report 2016–17*, <https://www.weforum.org/reports/the-global-competitiveness-report-2016-2017-1>, accessed 5 May 2017; World Bank, 'Doing business: Ease of doing business in Tanzania', <http://www.doingbusiness.org/data/exploreeconomies/tanzania>, accessed 5 May 2017; Freedom House, 'Tanzania', <https://freedomhouse.org/country/tanzania>, accessed 5 May 2017

For informal artisanal miners, the most important initial factors for beneficial formalisation are the ease of starting a business (attaining a primary mining licence) and access to electricity. From a policy perspective, if the government is committed to broadening the tax base then it must be made easy for informal miners, once registered and licensed, to pay taxes. The difficulties faced by artisanal miners will be detailed later, but suffice to note here that the process is costly and bureaucratic. Getting electricity is slightly easier. The informal processing sites I visited could get electricity relatively easily, although generators are costly to run.

41 World Bank, *Doing Business 2016: Measuring Regulatory Quality and Efficiency*, 'Economic Profile 2016: Tanzania', p. 4, http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2015/11/20/090224b0831eddf0/1_0/Rendered/PDF/Doing0business0fficiency000Tanzania.pdf, accessed 19 July 2016.

42 World Bank, 'Doing business: Economy rankings', <http://www.doingbusiness.org/rankings>, accessed 28 February 2017.

TAXATION

In general terms, the World Bank reports that Tanzania has made paying taxes more complicated by introducing an excise tax on money transfers, but also eased matters by lowering the skill and development levy. *The Economist* reported that Tanzania⁴³

makes it hard for honest companies to pay their taxes. Little wonder many less scrupulous ones don't bother: last year (2015) fewer than 500 companies contributed an astonishing 43% of government revenues. Many others paid nothing.

A Chatham House report confirmed these difficulties:⁴⁴

In addition to the need to increase taxation overall is the need to diversify revenue collection from the current focus on large, often foreign, enterprises based in Dar es Salaam. These enterprises provide 88 per cent of tax revenue, despite generating only 17 per cent of GDP.

In an important case for the mining industry, *The Economist* reported that the Tanzanian government owed Acacia Mining, the country's biggest large-scale gold producer, \$98 million in value added tax rebates – 'effectively an interest-free loan to the government'.⁴⁵ However, the *Globe and Mail* reported in April 2016 that a Tanzanian tribunal ruled that Acacia Mining – a subsidiary of Barrick Gold Corporation (a Canadian stock exchange-listed firm) – had engaged in a 'sophisticated scheme of tax evasion'⁴⁶ and evaded more than \$40 million in corporate taxes. The tribunal noted that Acacia had failed to pay any corporate tax between 2010 and 2013 in Tanzania, while at the same time paying more than \$400 million in dividends to shareholders. It ruled that this was tantamount to a sophisticated tax evasion scheme. Acacia responded by arguing that the ruling demonstrated a flawed understanding of its tax agreements with the government. For instance, it estimated that thus far it had invested around \$3 billion in Tanzania, an amount it claimed the government had agreed could be deducted from its tax bill. The company asserted that it had paid \$372 million in other taxes and royalties over the past three years.⁴⁷

Fuelling further conflict in the sector, on 3 March 2017 the government announced an export ban – with immediate effect – on gold, copper, silver and nickel ore. Acacia's shares plunged by 18% in response to the news.⁴⁸ While the desire for mineral value-addition

43 *The Economist*, 28 May 2016, *op. cit.*

44 Anyimadu A, *op. cit.*, p. 23.

45 *The Economist*, 28 May 2016, *op. cit.*

46 York G, 'Barrick Gold subsidiary evaded Tanzanian taxes, tribunal rules', *The Globe and Mail*, 5 April 2016, <http://www.theglobeandmail.com/report-on-business/international-business/african-and-mideast-business/barrick-gold-subsiadiary-evaded-tanzanian-taxes-tribunal-rules/article29533858/>, accessed 10 October 2016.

47 *Ibid.*

48 Sanderson H, Hume N & J Aglionby, 'Acacia Mining hit as Tanzania bans gold and copper ore exports', *Financial Times*, 3 March 2017, <https://www.ft.com/content/5edcae58-002a-11e7-96f8-3700c5664d30>, accessed 20 March 2017.

activities is well understood, the LSM sector is a significant tax contributor and foreign exchange earner. Tanzania cannot afford the loss of either.⁴⁹

The tax dispute, and the government's desire for local value addition to minerals, has raised a historic accusation – that LSM companies in Africa operate as value-reducing agents in an enclave fashion, benefiting foreign shareholders to the exclusion of local citizens while offloading negative externalities onto them. But LSM can help the Tanzanian economy to flourish if it is well governed. One important recent review of the literature⁵⁰ argues that LSM can mobilise resources for development and stimulate economic growth, but extraction by foreign firms in partnership with the state (predominantly the case in Tanzania) may mean a loss of land and livelihood for smallholders (in any sector).

Leading scholars Gavin Hilson and James McQuilken have argued that artisanal mining remains unrecognised on the development agenda as a crucial channel for poverty alleviation partly because attracting LSM has been pursued at the expense of ASM for the past four decades.⁵¹ Moreover, policy solutions that try to improve the plight of small-scale miners have resulted in attempts to assimilate these miners into the large-scale sector, ignoring the fundamental differences between the sectors. The relative favouring of large-scale operators has at times fuelled conflict between the two sectors, with artisanal miners – for instance – accused of trespassing on large companies' operating territories and stealing tailings, which they process themselves.

Policymakers can reduce the unnecessary conflict between LSM and ASM by pursuing options that encourage greater synergies and positive spillovers between the two sectors. Unlike the large-scale industry, informal miners continue to dig through boom-and-bust commodity cycles, and often boost local investment in agriculture and construction.⁵² One of the most enduring governance challenges for economies dependent on LSM is that

49 In 2015 alone, 'pearls, precious stones, metals, [and] coins' accounted for \$1.46 billion in export value. This is by far the single largest contributor to foreign exchange earnings – 25% in total. Without this income Tanzania would not be able to afford its imports. Gold and precious stones (diamonds and tanzanite) together fund 20% of Tanzania's single largest import category (mineral fuels, oils, distillation products). See Trading Economics, 'Tanzania exports', <http://www.tradingeconomics.com/tanzania/exports>, accessed 20 March 2017. Without these imports the country's economy cannot function. Every sector depends on imported fuel. While Tanzania has vast natural gas resources this will not solve this problem either, as the construction time and capital costs of building its own refineries render it dependent on imported refined fuels for the foreseeable future.

50 Pedersen R *et al.*, 'Rights to land and extractive resources in Tanzania: The history', DIIS (Danish Institute for International Studies) Working Paper, 11, 2016, http://pure.diis.dk/ws/files/706383/DIIS_WP_2016_11.pdf, accessed 20 March 2017.

51 Hilson G & J McQuilken, *op. cit.*

52 Hilson G, 'Artisanal mining, smallholder farming and livelihood diversification in rural sub-Saharan Africa: An introduction', *Journal of International Development*, 23, 8, 2011, pp. 1031–1041.

downscaling during bust periods almost immediately results in retrenchment of the most vulnerable workers. In general, as *The Economist* notes,⁵³

Governments that allow miners to legalise their operations see several benefits. They can keep a closer eye on labour and environmental conditions, *and collect millions of dollars in taxes that would otherwise not be paid*. In return, they sometimes offer miners basic services such as water and sanitation (emphasis added).

However, mere formalisation through legal title deeds is not as straightforward an answer as it may first appear, as the policy section shows.

POLITICAL AND ECONOMIC INSTITUTIONS

In resource-wealthy countries, the quality of institutions is a crucial determinant of whether that wealth will be a development blessing or curse. The counter-intuitive relationship between mineral or hydrocarbon abundance and relative under-development is now almost universally considered to operate through the channel of institutional quality.⁵⁴ In other words, if the state is unaccountable to its citizens at the time of resource discovery, the sale of those resources strengthens the power of a narrow elite at the expense of ordinary citizens. This is clearly part of the reason why elites tend to favour LSM over incorporating broad-based informal mining into the mainstream economy. Large-scale miners pay taxes and royalties that allow ruling coalitions to maintain power at a minimum cost to themselves. Ruling coalitions have strong incentives to suppress or co-opt citizens who demand stronger representation, especially if those citizens are under-resourced.⁵⁵

Measuring institutional quality is a controversial exercise, and many attempts have been criticised as capturing the outcomes of institutional quality rather than the institutions themselves.⁵⁶ If institutions are social systems – essentially an ecology of beliefs, norms, rules and organisations – that generate incentives that shape and motivate human behaviour,⁵⁷ they cannot easily be measured. However, there are a few useful proxies, although each one only highlights a single dimension of institutions. For instance, freedom of the press is an important indication of who controls the flow of information, and it is a useful proxy because it is exogenous to the relationship between resource wealth

53 *The Economist*, 'In praise of small miners: A boom in artisanal mining offers lessons in development', 7 May 2016, <http://www.economist.com/news/middle-east-and-africa/21698262-boom-artisanal-mining-offers-lessons-development-praise-small-miners>, accessed 25 July 2016.

54 Mehlum H, Moene K & R Torvik, 'Institutions and the resource curse', *The Economic Journal*, 116, 29, 2006, pp. 1–20. See also Van der Ploeg F, 'Natural resources: Curse or blessing?' *Journal of Economic Literature*, 49, 2, 2011, pp. 366–420.

55 Ross ML, 'Does oil hinder democracy?' *World Politics*, 53, 3, 2001, pp. 325–361.

56 Voigt S, 'How (not) to measure institutions', *Journal of Institutional Economics*, 9, 1, 2012, pp. 1–26.

57 Greif A, *op. cit.*

and corruption. If the press is free, citizens are more likely to be able to make informed decisions as to what they accept from their rulers. If, as in authoritarian contexts, the press is suppressed or highly manipulated, popular resource sovereignty is unlikely to exist.

Popular resource sovereignty is an important principle in any discussion about artisanal mining. Two covenants give legal expression to the [Universal Declaration of Human Rights](#). In the International Covenant on Civil and Political Rights (ICCPR), Article 1 states:⁵⁸

All peoples may, for their own ends, freely dispose of their natural wealth and resources without prejudice to any obligations arising out of international economic co-operation, based upon the principle of mutual benefit, and international law. In no case may a people be deprived of its own means of subsistence.

Article 47 of the same treaty states: 'Nothing in the present Covenant shall be interpreted as impairing the inherent right of all peoples to enjoy and utilize fully and freely their natural wealth and resources.'⁵⁹

Article 1 of the International Covenant on Economic, Social and Cultural Rights states:⁶⁰

All peoples may, for their own ends, freely dispose of their natural wealth and resources without prejudice to any obligations arising out of international economic co-operation, based upon the principle of mutual benefit, and international law. In no case may a people be deprived of its own means of subsistence.

Article 25 of the same treaty repeats Article 47 of the ICCPR verbatim.

Through these treaties, governments already have internationally accepted principles at their disposal to build legislation that recognises informal mining as a legitimate means of subsistence – and one that could contribute much more to development if the appropriate property rights were distributed to those who currently operate in the space of unseen (or purposefully ignored) informality. It is not clear in Tanzania that citizens' customary rights to mine informally are being sufficiently protected to ensure popular access to, and benefit from, the country's mineral resources.

More generally, on institutional performance Tanzania scores only a 'partly free' in the ['Freedom in the World 2017'](#) index compiled by Freedom House. Where 1 is 'most free' and 7 'least free', Tanzania scores 3 for political rights and 4 for civil liberties. Freedom

58 UN, OHCHR (Human Rights Office of the High Commissioner), 'International Covenant on Civil and Political Rights', <http://www.ohchr.org/en/professionalinterest/pages/ccpr.aspx>, accessed 25 July 2016.

59 *Ibid.*

60 UN, OHCHR, 'International Covenant on Economic, Social and Cultural Rights', <http://www.ohchr.org/EN/ProfessionalInterest/Pages/CESCR.aspx>, accessed 25 July 2016.

House estimates that 40% of the population are free, 24% partly free and 36% not free.⁶¹ These calculations are probably heavily influenced by the Zanzibar election controversy. The press is considered only 'partly free',⁶² and freedom of the press is one of the most significant indicators of institutional quality.

To harness the maximum value of informal mining, government bureaucracy should be effective. Freedom House in 2015 ranked Tanzania's government functionality at 7/12, down one place from the year before. With Magufuli's government the 2016 score may improve, but the 2015 report noted that⁶³

corruption is pervasive in all aspects of political and commercial life, but especially in the lucrative energy and natural resources sectors. Tanzania was ranked 119 out of 175 countries and territories surveyed in Transparency International's 2014 Corruption Perceptions Index.

Nonetheless, citizens do have access to public information, and Parliament publishes legislation, committee reports and budgets. Having said that, its 2015 rule of law score was only 9/16, largely because the judiciary 'suffers from underfunding and corruption', as many judges are political appointees.⁶⁴ The dynamics of corruption in Tanzania are well captured by researcher Hazel Gray, who writes that 'grand corruption is difficult to constrain because different factions within the ruling party hold equal weight and neither the president nor any particular faction is able to dominate within these elite struggles'.⁶⁵ She argues that this will also affect Magufuli because of the nature of Tanzania's political settlement. Despite the president's show of anti-corruption sentiment thus far, he will find it difficult to root out grand corruption because of the balance of power within the CCM.

Having located the artisanal mining discussion within the context of the country's broader development challenges, the following sections examine informal gold mining specifically, and how it can be mainstreamed to become part of an inclusive development agenda. To restate the problem, artisanal mining tends to generate 'negative reactions from governments, mining experts, and civil society groups, and is typically peripheral to economic planning for livelihood improvement and mineral sector development'.⁶⁶

61 Freedom House, 'Freedom in the World 2017: Populists and autocrats: The dual threat to democracy', <https://freedomhouse.org/report/freedom-world/freedom-world-2017>, accessed 28 February 2017.

62 Freedom House, 'Freedom of the Press 2017: Press freedom's dark horizon', <https://freedomhouse.org/report/freedom-press/freedom-press-2017>, accessed 25 July 2017.

63 *Ibid.*

64 Freedom House, 'Freedom in the World: Tanzania', <https://freedomhouse.org/report/freedom-world/2015/tanzania>, accessed 25 July 2016.

65 Gray HS, 'The political economy of grand corruption in Tanzania', *African Affairs*, 114, 456, 2015, pp. 382–403.

66 Fisher E, *op. cit.*, pp. 735–760.

A BRIEF HISTORY OF GOLD MINING



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Women pulverise – by hand – gold-bearing rock at an informal processing operation near the Nsangano small-scale mine in Geita region, Tanzania, April 2016. The rock arrives here after having been crushed by machine and purchased either from the small-scale mine nearby or from informal diggings in the surrounding area

ARTISANAL GOLD MINING IN TANZANIA

Gold extraction accounts for most artisanal mining in Tanzania, mined in three major fields – Lake Victoria, Lupa and Mpanda – in the Mwanza region, with Geita as the main town. Diamonds are mined predominantly in the Shinyanga region and tanzanite⁶⁷ is mined in the Merelani area near Arusha.⁶⁸ Unlike gold, diamonds and tanzanite account for relatively little informal mining, although the negative externalities are not dissimilar (except that mercury is not used in the latter two).

According to one local woman miner, many people in this region were locally employed in the mining sector under colonial rule, and gained the requisite knowledge and skills before the colonialists departed.⁶⁹ This long-standing local knowledge helps artisanal miners to know where to look for gold. These miners have no sophisticated geological maps or three-dimensional geological modelling from systematic drilling and sampling. All their skills have been inherited. Gold mining has dominated the Tanzanian mining industry for more than a century, ‘with a complex relationship having developed between large scale companies and artisanal miners’.⁷⁰ Organised prospecting dates to the German colonial period of the late 19th century, although formal mechanised mining did not begin until the mid-1930s with the development of the Musoma and Geita mines⁷¹ under the British colonial administration.

Historian AD Roberts recorded: ‘In the second half of the 1930s gold production in Tanganyika employed more men than did copper-mining in Northern Rhodesia, and the value of gold exports in these years was second only to that of sisal (from plantations near the coast)’.⁷² Between the two world wars the largest gold mining investment was made at Geita, near the south-western corner of Lake Victoria. Following the publication in 1934 of a report by British government geologists, production in Geita in 1939 was almost double that at any other mine and accounted for more than a quarter of total reef production in Tanganyika.⁷³ Increasing gold revenues, however, only served to compensate

67 Helliesen MS, ‘Tangled up in blue: Tanzanite mining and conflict in Mererani, Tanzania’, *Critical African Studies*, 4, 7, 2012, 58–93.

68 For an important piece on tanzanite artisanal mining in Tanzania, see Pardieu V & RW Hughes, ‘Working the blueseam: The tanzanite mines of Merelani’, [ruby-sapphire.com](http://www.ruby-sapphire.com), July 2008, <http://www.ruby-sapphire.com/tanzania-tanzanite-mines.htm>, accessed 15 December 2016.

69 Interviewee response. This researcher had a team of two interpreters and a local driver. These answers are paraphrased to represent a general view where methodologically appropriate. Where there were conflicting answers from different respondents, this is explicitly communicated.

70 Mwaipopo R *et al.*, ‘Increasing the Contribution of Artisanal and Small-Scale Mining To Poverty Reduction in Tanzania’, UK Department for International Development, Report, 2004.

71 TMGOF (Tanzania Mines, Gas/Energy and Oil Forum), ‘Tanzania artisan small scale miners’, 23 June 2016, <http://www.tmgof.or.tz/tanzania-artisan-small-scale-miners/>, accessed 15 December 2016.

72 Roberts AD, ‘The gold boom of the 1930s in Eastern Africa’, *African Affairs*, 8, 341, 1986, pp. 545–562.

73 *Ibid.*, p. 557.

for the earlier sunk costs incurred by the government's mining administration, and Roberts concluded that inter-war gold mining was ultimately a failure.

Nonetheless, gold production across Tanzania accounted for at least 10% of the population in paid employment by 1936. Throughout the war years gold production fell, and by 1945 constituted less than 5% of Tanzania's exports. Geita mine – a private investment near Geita town – was the most profitable, but only survived until 1965. It appears to have been a disappointing legacy after the boom of the 1930s.

However, even as the decline of smallholder farming has driven people towards artisanal mining, the presence of mining has also historically created a spur to agricultural innovation.⁷⁴ This was one of a few immediate positive spillover effects, as food was not easily available from elsewhere. This remains an important contemporary link, and policymakers have been urged to 'promote both activities sustainably and preserve the linkages between smallholder farming and ASM activities'.⁷⁵

Overall, the view from 1986 – looking back – was that gold mining was unprofitable for large-scale corporates across East Africa, and only ever took off because of the Great Depression in the 1930s. The only benefit conferred on local Tanzanians, for instance, appeared to have been the inadvertent effect of capital transfers from mine owners into the country. Roberts argued that South African investors were likely to have sunk more capital into Tanzanian gold mining than they ever received back. This scenario is notably different to the modern reality, with large-scale gold production having taken off considerably since the 1980s.

The historical relationship between large-scale and small-scale mining is difficult to disentangle. In the beginning, all mining in Tanzania was small scale, but only colonially run projects became mechanised and scaled up. World War II put an abrupt end to the trajectory towards LSM. Local ASM continued without the adoption of new technologies, due to miners' lack of access. By the time LSM was initiated in the early 1980s, there was a sizeable operational gulf between it and ASM. LSM prospecting has followed artisanal activities, and artisanal miners have in turn attempted to access sites allocated to large corporates to re-mine company waste or marginal ground. This has resulted in cases of significant conflict, the most high profile of which was the death of 17-year-old Mhoja Leonard, who was 'reportedly searching for waste material at AngloGold Ashanti's mine when he was shot and killed by a security guard'.⁷⁶

74 For an important discussion on the history of the relationship between mining and agriculture, see Hilson G & C Garforth, "Agricultural poverty" and the expansion of artisanal mining in sub-Saharan Africa: Experiences from southwest Mali and southeast Ghana', *Population Research and Policy Review*, 31, 3, 2012, pp. 435–464.

75 Hilson G, *op. cit.*, p. 1040.

76 Moloo Z, 'Local miners left out by Tanzania gold rush: Competition between multinational mines and local gold prospectors has resulted in tension spilling into violence', *Aljazeera*, 8 June 2013, <http://www.aljazeera.com/indepth/features/2013/05/2013515161130258616.html>, accessed 15 December 2016.

NEGATIVE HEALTH AND SAFETY EXTERNALITIES



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Very few of the men wear protective equipment; these were the exception, although they did not have helmets or hard hats. This is especially concerning when men are down the shafts or using mercury to process the ore

Artisanal mining in Tanzania 'is characterised by low employment security and health hazards such as frequent injuries from accidents, exposure to sexually transmitted diseases, silicosis and mercury poisoning'.⁷⁷ Interview respondents confirmed these dangers. Pit collapses are frequent during the rainy season, with some estimates of at least one collapse every five or six weeks. There is very little use of safety gear, as demonstrated in the pictures. One small-scale mine owner quipped that 'safer is faster' – pit collapses are costly and take time to repair; similarly, labour re-training costs are high if employees are lost through either injury or mercury poisoning. His was a relatively formalised operation, and yet there was no evidence of real commitment to safety. When asked about why his employees were not wearing gloves when dealing with mercury, for instance, he shrugged.



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An informal miner near Mawemeru Village uses mercury to pan for gold from crushed ore (bought from informal and small-scale diggers). When the miner's friend (to his immediate right) was asked whether he knew of any health effects associated with mercury, he answered that it 'causes a person to look as if they have HIV – their bodies start wasting away' and 'it can also cause a person to go mad'. When asked why his friend used mercury without gloves or boots, he responded that it was due to 'ignorance'

77 Jönsson JB, Appel PWU & RT Chibunda, 'A matter of approach: The retort's potential to reduce mercury consumption within small-scale gold mining settlements in Tanzania', *Journal of Cleaner Production*, 17, 1, 2009, p. 77.



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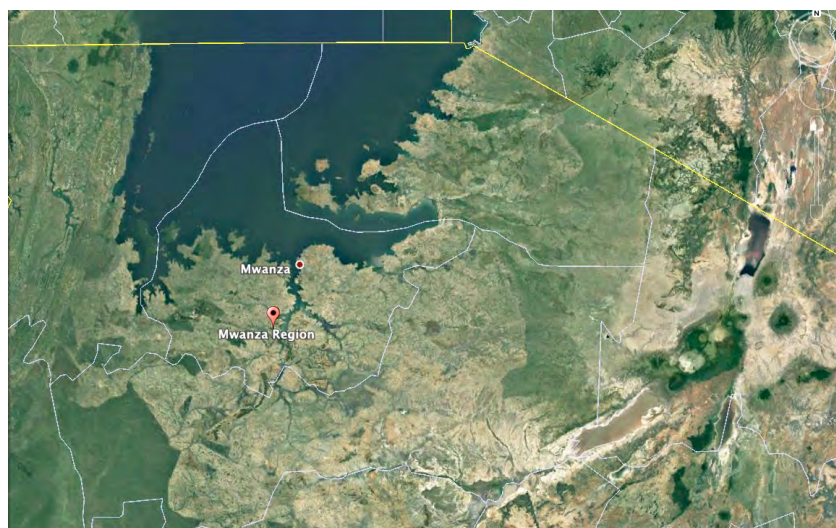
A miner at the Nsangano operation uses mercury (in the Coca-Cola bottle) to extract gold from the crushed ore

While labour movement is relatively free and there is little evidence of coercion or forced labour, one of the drawbacks of informal work contracts is that health and safety externalities are not properly costed. Formal large-scale companies incur the costs of providing safety training and equipment for employees. But small-scale and artisanal operators tend to view this as a costly inconvenience, despite mercury poisoning having negative health effects and causing environmental degradation. This has a negative impact on the welfare of artisanal miners and community members, which ultimately costs the owner of the small-scale mine.

Most people involved in the sector use 'excessive quantities of hazardous mercury in their gold extraction processes'.⁷⁸ Using mercury to amalgamate gold, after extraction, emits noxious elemental and metallic mercury, which 'bio-accumulate in aquatic ecosystems and are eventually transformed into toxic methylmercury (MeHg) by micro-organisms'.⁷⁹

78 Jønsson JB, Appel PWU & RT Chibunda, *op. cit.*, p. 78.

79 Hilson G, 'Abatement of mercury pollution in the small-scale gold mining industry: Restructuring the policy and research agendas', *The Science of the Total Environment*, 362, 1-3, 2006, pp. 1-14.

FIGURE 2 MAWEMERU VILLAGE, MWANZA REGION, TANZANIA

Source: Maplandia.com, 'Mawemeru map', <http://www.maplandia.com/tanzania/mwanza/geita/mawemeru/>, accessed 20 October 2016

Some 'condenses on the ground and enters the food chain through the drainage system'.⁸⁰ Contamination then occurs through the consumption of livestock, fish or crops.

It is evident that peer-to-peer learning about the effects of mercury is limited, and what one miner termed 'ignorance' may be reluctance to change behaviour, since the symptoms of contamination are not immediately obvious. As a recent study put it: 'It is difficult to convince miners to adopt a "cleaner" procedure since their panning activities are compatible with their low income and knowledge.'⁸¹ However, one respondent near Geita told us that mercury use can 'cause a person to look as if they have HIV – their bodies start wasting away, and can also cause a person to go mad'.⁸² The scientific literature confirms this – organic mercury, once accumulated in the bloodstream or kidneys, gradually crosses the blood–brain barrier and induces a wide range of neuropsychological disorders.⁸³

80 Jönsson JB, Appel PWU & RT Chibunda, *op. cit.*, p. 80.

81 Veiga M, Gustavo A & JA Meech, 'Review of barriers to reduce mercury use in artisanal gold mining', *The Extractive Industries and Society*, 1, 2, 2014, pp. 351–61.

82 When asked why his colleague was still using mercury if these were the symptoms, he replied, 'ignorance'. This raises the question of why information is not being shared among peers.

83 Chan HM *et al.*, 'Impacts of mercury on freshwater fish-eating wildlife and humans', *Human and Ecological Risk Assessment: An International Journal*, 9, 4, 2003, pp. 867–883.



© Ross Harvey, 2016

These gold-mercury amalgams are burned to reduce the mercury and leave the gold behind

One of the policy imperatives is how to realistically incentivise changed behaviour.⁸⁴ Mercury is efficient, simple to use, and readily available from any number of suppliers in the villages that spring up in mining areas. Our 2016 field research suggests that the cost of mercury is not prohibitive – respondents said that it was ‘cheap’ – and therefore miners are unlikely to recycle it. This is, however, contrary to findings in 2009 that ‘the current mercury price constitutes an economic incentive to reduce mercury consumption and adopt alternative extraction methods’.⁸⁵ The 2009 study concluded that, despite the availability of mercury-free extraction methods, many of these are not yet appropriate for adoption, ‘given the technological and societal context in which small-scale mining takes place’.⁸⁶ Past approaches to technology provision have been top-down and technocratic, leading to limited uptake. Retort adoption appears to be the optimal interim measure.

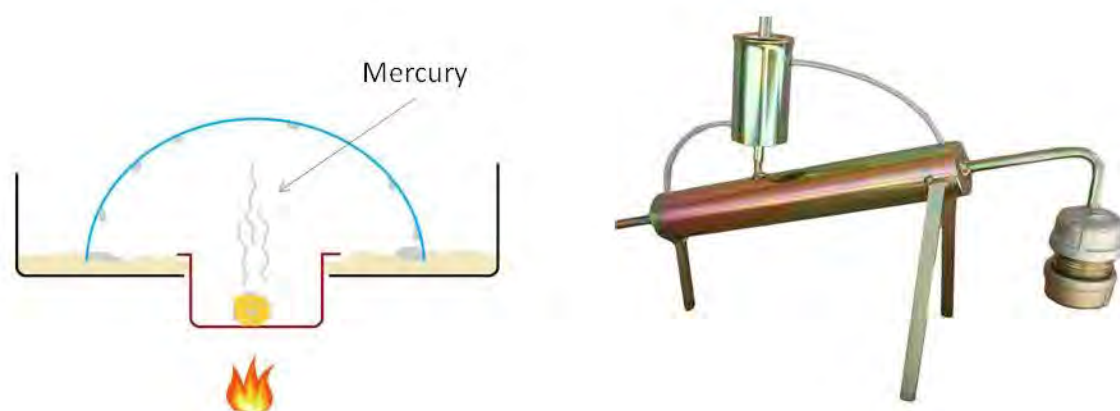
Retorts are devices that recycle mercury during amalgamation. The most appropriate retorts for Tanzania are different forms of galvanised iron, made from plumbing materials. Appropriateness is determined by the local availability of material, ease-of-use demonstration, and cost-effectiveness.⁸⁷

84 For a review of recent efforts to reduce mercury usage, see Veiga M, Gustavo A & JA Meech, *op. cit.*

85 Jønsson JB, Appel PWU & RT Chibunda, *op. cit.*, p. 80.

86 *Ibid.*, p. 78.

87 Veiga MM, Maxson PA & LD Hylander, ‘Origin and consumption of mercury in small-scale gold mining’, *Journal of Cleaner Production*, 14, 3–4, 2006, pp. 436–47.

FIGURE 3 IRON RETORT FOR MERCURY RECYCLING

Source: Artisanal Gold Council Blog, July 16, 2013, http://2.bp.blogspot.com/-sM6vxz7g0ZY/UeXRcTiaSxI/AAAAAAAAACU/Wr1HT4Xni-c/s1600/Retort+kitchen+owl+drawing_Hg+labeled.jpg, accessed 28 February 2017

If used properly, they can recycle up to 95% of the mercury:⁸⁸

By recycling mercury, small-scale miners save money for mercury purchasing and thus have more money for themselves. Also, gold loss during open air burning of gold due to spattering is avoided. Simultaneously, most of the health and environmental problems stemming from the use of mercury are prevented.

Despite its having admirable policy intentions, the state does not currently possess the financial or technical capacity to foster the large-scale adoption of mercury-reducing technologies across a heterogeneous sector. Although retorts are required in mining legislation, a large gap exists between policy and practice; previous attempts to introduce retorts largely failed because of the inadequacy of a technocratic approach.⁸⁹ If adoption is to be successful the miners' trust must be gained, and long-term training and context-sensitive participatory planning should be offered.⁹⁰ Support will have to be provided in the form of partnerships between large-scale private operators, the government, civil society and global institutions such as the World Bank.

Appropriate measures to reduce negative health and environmental externalities should be scaled up as soon as possible. Many of the negative effects of these externalities are not felt immediately and there appears to be little incentive to mitigate them. Any technological support should simultaneously increase profit margins through lowering direct costs

88 Jönsson JB, Appel PWU & RT Chibunda, *op. cit.*, p. 81.

89 *Ibid.*

90 *Ibid.*, p. 78.

(recycling of mercury) and reduce externalities to improve miners' health and the natural environment. It makes economic and environmental sense to support artisanal miners by aiding the adoption of new and appropriate technologies that both save them direct costs and minimise the externalities generated by their activities.

Addressing the mercury problem would also amplify the positive spillover benefits of artisanal mining. Re-investing profit into agricultural activities, for instance, would yield greater returns if mercury contamination of aquatic ecosystems were eliminated. Similarly, people in the mining communities providing other economic goods and services would be better served by a healthier population of miners.



The waste from the Swiss boxes that is not processed using mercury is piled up in walls of sludge. Workers shovel this waste to other processors, some of whom use cyanide to extract gold

NEGATIVE ENVIRONMENTAL EXTERNALITIES

Mercury poisoning is a double-edged sword in that it affects both human health and environmental degradation. But there are other environmental and safety challenges too. In a field survey conducted in 2002 mining communities ranked the problems of



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A pit built from timber chopped from a nearby forest, near Mawemeru Village. On average, these pits range in depth from about 20–35m, with tunnels then proceeding horizontally from there, sometimes for a few kilometres

‘abandoned pits’ and ‘deforestation’ as third and fourth respectively.⁹¹ These problems are connected in that timber is removed from nearby forests, or trees are simply cleared to make space for pits to be dug. The Mwanza region near Geita is littered with abandoned pits and tree clearings. Deforestation is problematic for two primary reasons. First, food security – derived from functional forest ecosystems – may be undermined. Second, forests serve as important carbon sinks – their preservation is a far more effective climate change-mitigation device than planting new trees.

The UN’s [Reducing Emissions from Deforestation and Forest Degradation \(REDD\)](#) initiative could provide alternative livelihoods for citizens who might otherwise engage in informal mining. However, the ASM sector could be undermined by REDD if policy interventions are not sufficiently localised to be context-appropriate.⁹²

91 Kitula AGN, ‘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, pp. 405–14.

92 Hirons M, ‘Locking-in carbon, locking-out livelihoods? Artisanal mining and REDD in sub-Saharan Africa’, *Journal of International Development*, 23, 8, 2011, p. 1141.

Across the region [sub-Saharan Africa], the burgeoning ASM sector is being formalised in recognition of its potential to contribute to poverty reduction. However, if REDD restricts access to suitable mineral reserves in forested areas, it could potentially 'lock out' a valuable source of rural employment.

Frustrated communities may, for instance, start bush fires, as happened in Gorongosa National Park.⁹³ Even resolving land tenure disputes, as part of better governance, may not necessarily improve forest conservation – improved tenure security may increase mining activity, which may lead to increased deforestation. In short, livelihood sustainability should be at the heart of REDD policymaking, lest it causes the further marginalisation and criminalisation of ASM, undermining itself in the process.⁹⁴ Companies such as Carbon Tanzania, which pay revenues derived from the purchase of carbon credits directly to communities to preserve forests, need to become an integral part of cross-sectoral governance conversations.⁹⁵

Reducing negative externalities requires a proficient set of institutions to support practical interventions. Efforts thus far, particularly to reduce mercury consumption, have been impeded by overly technical approaches without accompanying support and monitoring of effectiveness.⁹⁶ Moreover, a general failure to understand the complex dynamics of mining settlements has resulted in the ineffective dissemination of new technologies.⁹⁷ Given these complex dynamics, a case below is made for building policy specific to ASM.

Reducing negative externalities requires a proficient set of institutions to support practical interventions

INSTITUTIONAL EVOLUTION

At the beginning of the post-colonial era, individual small-scale miners could be granted a prospecting licence. This individual licence holder would hold a claim informally owned by an association of shareholders. Workers were paid in the form of food and a percentage of production. The main licence holder typically held the majority share. In the 1970s sub-leasing became a prominent form of industry organisation – a company could hold a licence for an area and outsource production to individuals, essentially sub-contractors 'who were given the non-legal status of "pit-owners" and who sold their produce to the company'.⁹⁸

Artisanal gold and diamond mining expanded through the 1980s and most operations would have been considered illegal, which led pit diggers to claim the portion of land they were digging, creating a system of informal rights. Sub-contractors would then buy gold from informal miners. However, when the government started to encourage these

93 Dondeyne A *et al.*, 'Artisanal mining in central Mozambique: Policy and environmental issues of concern', *Resources Policy*, 34, 1–2, 2009, pp. 45–50.

94 Hiron M, *op. cit.*

95 Interview with Marc Baker, CEO of Carbon Tanzania, Arusha, 22 April 2016. See also Carbon Tanzania, <http://www.carbontanzania.com>, accessed 28 February 2017.

96 Jönsson JB, Appel PWU & RT Chibunda, *op. cit.*, p. 81.

97 Hilson G, 2006, *op. cit.*

98 Fisher E, *op. cit.*, p. 745.

sub-contractors to apply for small-scale licences in the early 1990s they were relatively well placed to secure them, to the exclusion of the informal pit diggers.



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A small-scale operation run by Mr Nsangano, who inherited the licence from his father and now runs the mine with his brother. A tour of the operations revealed a higher degree of production organisation than at informal diggings but still a low degree of technology adoption (partly because of the difficulty of attracting direct investment)

The system enabled more powerful players to register formal titles to land to which other pit owners already held informal titles, which 'created complex disputes over access to mining land, contributing to apparently intractable conflicts in the [Mwanza] area today'.⁹⁹ Fisher offers the example of Mgsusu Village to demonstrate contemporary problems embedded in the path dependence of historical institutional evolution.¹⁰⁰ Here, artisanal

99 *Ibid.*, p. 746.

100 *Ibid.*

miners live in a national forest reserve and process their gold in the river that runs through it, which highlights the negative environmental externalities mentioned earlier. The diggings also border Geita Gold Mine owned by Anglo-Gold Ashanti, and there have been numerous conflicts here between large-scale formality and artisanal informality. Artisanal miners, for instance, have been accused of trespassing on Ashanti property and stealing waste material. Settlement in the forest was not legally permitted and water sources were protected from communal use by the Forestry Act of 2002. In 2006 villagers were eventually granted permission by the government to register the settlement as a formal village.

Fisher points out that institutional ‘bricolage’ has generated types of social exclusion that are often overlooked in the process of formalising the industry. ‘Bricolage’ is a term used to describe how informal claims based on social organisation and culture clash with formal claims based on contracts and legal rights. Those with access to the latter tend to be more powerful and thus exclude and marginalise informal miners in the process of becoming more formal.



The owner of a small-scale Nsangano gold mine, Mike Nsangano

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The only means of communication with the pulley operators is via a broken pipe

CURRENT INSTITUTIONAL CONTEXT OF ARTISANAL MINING IN TANZANIA

Current legislation aims to integrate artisanal miners into a modernised mining sector. The process of formalisation is set within the broader government-level commitment to improved security of tenure over mining land, enabling miners to gain legal and transferable titles to mineral claims. The 1998 Minerals Act¹⁰¹ promoted title acquisition by artisanal miners through the provision of a primary prospecting licence (PPL) and a primary mining licence (PML) respectively. A PPL was valid for one year to prospect for gemstones or minerals and was renewable. It did not confer exclusive land rights to the area being explored. A PML, by contrast, conferred exclusive land rights, and was renewable every five years. It was also transferable. The 2010 Mining Act¹⁰² repeals the PPL category and only retains the PML for ‘small scale mining operations, whose capital investment is less than US\$ 100,000’.¹⁰³ It does, however, add a ‘mining licence’

101 United Republic of Tanzania, Mining Act 1998 (Act no. 2 of 1998), <http://www.geichina.org/ep/uploadfile/policy/uploadfile/200801/20080124040107828.pdf>, accessed 5 May 2017.

102 United Republic of Tanzania, Mining Act 2010 (Act no. 14 of 2010), https://mem.go.tz/wp-content/uploads/2014/02/0013_11032013_Mining_Act_2010.pdf, accessed 5 May 2017.

103 *Ibid.*, p. 11.

category for medium-scale mining ‘whose capital investment is between US\$100,000 and US\$100,000,000’.¹⁰⁴ It now costs TZS¹⁰⁵ 50,000 (\$23.14) to purchase a PML, and \$2,000 for a mining licence (or its renewal).¹⁰⁶ These are prohibitively high costs for most artisanal miners.

The government’s own assessment of the state of mining in Tanzania by 2009 stated that, despite some admirable achievements,¹⁰⁷

the mineral sector has continued to face challenges, particularly low [levels of] integration with other sectors of the economy; low contribution to the GDP compared to the sector growth; slow development of small scale mining; low capacity of the Government to administer the sector; low level of value addition of minerals; and environmental degradation.

The 2009 Mineral Policy, followed by the 2010 Mining Act, was designed to address these challenges and aims to ‘support and promote development of small scale mining to increase its contribution to the economy’.¹⁰⁸ It recognises that local financial institutions have not developed appropriate financing packages for small-scale miners, as they ‘do not fully understand the economic potential’¹⁰⁹ of the sector. Lack of access to finance impedes investment in the sector. The government recognises that, despite its efforts to formalise artisanal miners into small-scale miners and provide extension services, the ‘contribution of small-scale mining to the economy is insignificant’.¹¹⁰ It attributes the problem to ‘the use of inappropriate technology and lack of capital’.¹¹¹ The resultant policy statement reads as follows:¹¹²

- i The Government will develop and implement programmes to transform and upgrade small scale mining into organized and modernized mining;
- ii The Government will cooperate with stakeholders to facilitate small-scale miners to access market for minerals, geological information, technical and financial services; and
- iii The Government will continue to collaborate with stakeholders to ensure that small scale miners preserve the environment.

104 *Ibid.*

105 Currency code for the Tanzanian shilling.

106 United Republic of Tanzania, ‘Subsidiary legislation: Regulations under section 112 of the Mining Act, No. 14 of 2010’. Pub. L. No. ISSN 0856-034X (2012), <https://mem.go.tz/wp-content/uploads/2014/08/SUBSIDIARY-LEGISLATION00011.pdf>, accessed 18 October 2016.

107 United Republic of Tanzania, Ministry of Energy and Minerals, ‘The Mineral Policy of Tanzania’, 2009, p. 5, http://www.tanzania.go.tz/egov_uploads/documents/0014_11032013_Mineral_Policy_of_Tanzania_2009_sw.pdf, accessed 26 July 2016.

108 *Ibid.*, p. 15.

109 *Ibid.*, p. 11.

110 *Ibid.*, p. 15.

111 *Ibid.*

112 *Ibid.*, p. 16.

Perhaps the biggest challenge is that the new policy still does not recognise that ‘while some individuals benefit from formalisation processes, others are excluded from gaining a title to resources over which they hold “informal” claims’ and are often incorporated into formal holdings as subordinates without their own rights being recognised

The 2009 policy also recognises the problem of child labour in the small-scale mining sector and aims to address it. Unfortunately, it does not explicitly address the other social and environmental externalities associated with the sector. Perhaps the biggest challenge is that the new policy still does not recognise that ‘while some individuals benefit from formalisation processes, others are excluded from gaining a title to resources over which they hold “informal” claims’¹¹³ and are often incorporated into formal holdings as subordinates without their own rights being recognised.¹¹⁴ Field research interviews conducted in April 2016 for this report revealed at least two more major barriers to formalisation. First, several respondents did not want to be formalised, citing the requirement of being restricted to one claim area as unjustifiably risky without more accurate and reliable prior geological knowledge. Second, most respondents indicated that they simply could not afford the capital outlay required or the transaction costs (owing to ineffective bureaucracy) of attaining a formal licence for a small-scale mine.¹¹⁵ The 2009 policy does not explicitly recognise these problems as barriers to formalisation. Nonetheless, interested parties broadly welcomed the policy for formally recognising the difficulties associated with ASM in Tanzania.

For this reason, stakeholders expected much from the 2010 Mining Act, which was meant to address the challenges noted in the 2009 Mineral Policy and was the most debated act during the 19th parliamentary session. By and large, however, it seems the act has failed to meet expectations.¹¹⁶ General sentiment in the literature is that it predominantly targets the creation of an investor-friendly environment for LSM and does not improve the basic conditions for artisanal operators.¹¹⁷

One of the major generators of conflict in countries with large areas subject to artisanal mining is distrust between large-scale and informal miners. Tanzania is no exception. Large-scale miners are often granted licences to land already allocated to small-scale licence holders, which creates tension.¹¹⁸ Insufficient provision of information to both large-scale and small-scale miners is a serious governance issue and ‘may result in LSM companies being reluctant to provide compensation to people and institutions, whose

113 Fisher E, *op. cit.*, pp. 744–745.

114 Jönsson JB & N Fold, *op. cit.*, pp. 479–493.

115 A primary licence costs roughly \$23, which seems a relatively small amount of money. But purchasing such a licence confines one to a specified, unmovable plot of land, which may not yield dividends in the long run. ‘Affordability’ here is therefore best understood in the broader sense of the word rather than being merely monetary.

116 Mambi AJ, ‘Draft Report on the Review of the Mining Act 2010 and Mineral Policy of 2009 to Identify Gaps on the Rights and Participation of Women Artisanal Miners in Tanzania’, TAWOMA (Tanzania Women Miners Association), January 2011, <https://womin.org.za/images/impact-of-extractive-industries/women-and-artisanal-mining/A%20J%20Mambi%20-%20Participation%20of%20Women%20Artisanal%20Miners%20Tanzania.pdf>, accessed 27 February 2017.

117 *Ibid.*; Pedersen R *et al.*, *op. cit.*

118 Makene M, Emel J & J Murphy, ‘Calling for justice in the goldfields of Tanzania’, *Resources*, 1, 1, 2012, pp. 3–22.

existence they were not aware of prior to their investment'.¹¹⁹ As is common in other mining jurisdictions, the lack of digitised, centrally managed cadastres results in this avoidable overlap.

Jönsson and Fold argue that in the inevitable march towards formalisation, the process should realistically consider the practical and material realities of artisanal mining. There are different forms of informality, for instance. Some miners enter the concession areas of large-scale mines; some operate without a formal licence but are recognised by local communities; and others violate the mining law unwittingly (through lack of access to information).¹²⁰

The 2010 Mining Act should therefore be amended to address both the challenges delineated in the 2009 Mining Policy and the bottlenecks that hinder artisanal mining progress, as outlined above. Zonal mining offices could provide site-specific geological and technical knowledge to artisanal miners. They could also partner with banks or government development corporations to provide credit facilities for small-scale investments.

Finally, the minerals ministry needs to find a way of improving health and safety conditions for informal miners. Pit collapses and mercury poisoning are widespread and welfare-reducing externalities that affect thousands of lives. They exacerbate the already-limited stability associated with informality, further reducing the probability that entrepreneurial miners will be prepared to endure the constraints that come with attaining a licence. And without more extensive licence acquisitions the state will continue to forego the tax benefits it could otherwise gain from formalising the sector (even if only in very limited ways). As most scholars reiterate, informal miners need to be viewed as potential contributors to Tanzania's development. 'Positioning ASM and the people involved in a positive perspective is a precondition for correcting the detrimental environmental and social impact while exploiting the developmental potential.'¹²¹

Informal miners need to be viewed as potential contributors to Tanzania's development

POLICY ADAPTATION TO MAXIMISE THE DEVELOPMENT BENEFIT OF ARTISANAL MINING

Ultimately, some level of formalisation appears necessary to reduce the negative externalities of artisanal gold mining in Tanzania. However, merely articulating the need for formalisation in law is inadequate. The way in which the relevant policy frameworks are crafted is crucial to ensuring that the policy is implemented. They should provide incentives that are compatible with the context-specific realities faced by real artisanal miners (as opposed to the prototype that legislators appear to have in mind). In other words, a deeper comprehension of the current obstacles to formalisation is necessary. Licensing procedures are administered by a relatively ineffective bureaucracy. The barriers to entry are high, and the benefits are not obvious. Paying taxes and having to comply with

119 Jönsson JB & N Fold, *op. cit.*, p. 486.

120 *Ibid.*, pp. 489–490.

121 *Ibid.*, p. 490.

Incentives to formalise may entail the possibility of increased stability and being able to attract formal financing and infrastructure investment. Yet few artisanal miners possess the required knowledge to pursue this path, and would be reluctant to incur the risk unless they had stronger geological knowledge

environmental standards are likely to undermine already small profit margins. Moreover, formalisation constrains licence holders to a very specific (and normally small) piece of land, which erodes the perceived benefits of being able to move from claim to claim. Barriers to establishing a formal business also have a ‘disproportionately negative effect on women, often making it impossible for them to get started’.¹²² Incentives to formalise may entail the possibility of increased stability and being able to attract formal financing and infrastructure investment. Yet few artisanal miners possess the required knowledge to pursue this path, and would be reluctant to incur the risk unless they had stronger geological knowledge.

Perhaps the strongest criticism of the 2010 Mining Act is that it fails to address the complexity of the relationship between surface land rights and mineral (or subsoil) rights. Artisanal miners complain that large-scale miners have been granted prospecting and mining rights to areas that they (artisanal miners) discovered.¹²³ These claims have not been formally recognised, as informal miners simply do not have access to the institutions that register businesses and issue licences. Even travelling to Mwanza (the nearest zonal mining office to Geita) is about 3.5 hours’ drive, and includes an unpredictable ferry crossing.

There are a number of other areas in which the 2010 Mining Act fails to give effect to some of the ambitions espoused by the 2009 Mining Policy.

First, where the policy aims to support and promote the development of small-scale mining to increase its contribution to the economy, the act fails to incorporate this objective. While the act does provide for one small-scale mining representative on the Mining Advisory Board,¹²⁴ this is not sufficient to ensure the broad-based development of the sector. Given the narrow tax base detailed above, regulations need to be developed under the act that give effect to developing the sector. One way this can be done is to lower the costs of applying for, renewing or transferring licences. Without this, formalisation will essentially become an exercise in granting access to economic opportunity only to those who are already relatively well off (or politically connected). This will worsen rather than reduce inequality. The legislation also needs to be clear on how conflicts between subsoil and surface rights are to be resolved. In the current articulation, large-scale miners are likely to trump customary-right holders. This will exacerbate the tension that already exists between large-scale and artisanal miners, instead of reversing it. Part of the problem can be resolved by having a centralised and accurate cadastre of the spatial distribution of licences.

Second, on matters of safety, occupational health and environmental protection, the act is far-reaching.¹²⁵ It requires, for instance, that an application for a mining licence include a feasibility study that sets out ‘such measures as the applicant proposes to take in relation

122 Mambi AJ, *op. cit.*

123 *Ibid.*

124 Mining Act, *op. cit.*, Part III, Section 23 (3)(b)(vii).

125 See Mambi AJ, *op. cit.*, pp. 28–31.

The legislation also needs to be clear on how conflicts between subsoil and surface rights are to be resolved

to any adverse impacts to the environment'.¹²⁶ The regulations presuppose that applicants will have read and understood these technical and complex requirements. Because occupational health and safety, and environmental protection, are key to simultaneously improving welfare and reducing the negative externalities of artisanal mining, the government needs to provide regulations and plans that commit it to implementable plans. For instance, rolling out retorts to recycle mercury is a policy solution that will achieve many objectives simultaneously. It does, however, have to be done in a consultative manner that meets the specific needs of artisanal miners, many of whom may continue to operate without a formal licence. It is unrealistic to expect that all artisanal miners will become formalised overnight by attaining expensive licences that require adherence to a stringent set of legal requirements. The 2010 Mining Act therefore needs to incorporate the government's strategy to support artisanal mining as a key development sector.

A final issue that warrants reflection is whether artisanal miners are receiving a fair price for their gold.¹²⁷ Our field research revealed some interesting data in this respect. Miners at small-scale mines earned on average about TZS 10,000 (\$4.63) for each sack of ore they extracted from the underground tunnels, depending on the quality of the grade. Workers keep three of every 10 sacks they extract to sell at their discretion. Managers at both small-scale mines we visited said they earned about TZS 95,000 (\$43.98) per gram of processed gold, yet the current international gold price is only about \$40.58 per gram (for 24 karat pure gold). It is hard to explain this discrepancy. Informal gold sellers were receiving about TZS 75,000 (\$34.72) per gram.

John Childs, a researcher at Lancaster University, records one interviewee as saying that the gold is often purchased by Indian buyers, who send the gold to Dubai and exchange it for other commodities such as phones, and receive 'maybe two times what is the official price in the London metal market'.¹²⁸ One prominent initiative that has sought to address this difficulty is [Fairtrade Africa](#) – a labelling organisation with past successes in coffee, tea, cocoa and bananas. Launched in Tanzania in 2012, it promises to protect miners from the worst effects of neoliberal globalisation and to help them to gain greater access to its purported benefits.¹²⁹ It promises better prices in exchange for certifying that the gold is produced safely, responsibly and in an environmentally responsible manner. Childs argues that one of the reasons for Fairtrade Africa gold's failure to transform artisanal mining in Tanzania is that it does not generate trust among sellers, who believe they can receive higher prices from other traders known as *makota*. Fairtrade gold is also perceived as a paternalistic imposition that better serves large-scale miners seeking to 'greenwash' their product than small-scale or artisanal miners.¹³⁰ Therefore, the 2009 policy objective

Because occupational health and safety, and environmental protection, are key to simultaneously improving welfare and reducing the negative externalities of artisanal mining, the government needs to provide regulations and plans that commit it to implementable plans

126 Mining Act, *op. cit.*, p. 45.

127 For a full discussion on Fairtrade gold in Tanzania, see Childs J, 'A new means of governing artisanal and small-scale mining? Fairtrade gold and development in Tanzania', *Resources Policy*, 40, 2014, pp. 128–136.

128 *Ibid.*, pp. 132–133.

129 *Ibid.*

130 *Ibid.*

of creating a fair and consistent market for artisanal miners has not been met, and this remains a formidable challenge.

CONCLUDING REMARKS

Tanzania faces a significant number of development challenges. While its economy continues to grow at just above 4%, the population is growing at 3.5%. Its growth is off a low base and the pace is likely to slow down. This growth also does not promise sufficient income growth and labour absorptivity. Coupled with the fact that educational outcomes are of poor quality when compared to the region, and that upper secondary school enrolment remains low, it is unlikely that the economy is going to be able to absorb the high number of people that will be looking for jobs. At the same time, foreign aid is declining and the tax base is narrow. The ability of the public sector to function effectively is questionable, even though it appears positive that Magufuli is rooting out corruption at some level.

The Tanzanian government needs to harness the entrepreneurial talent in the sector to broaden the tax base and diversify sources of tax revenue

Within this matrix of challenges, the artisanal and small-scale gold mining sector provides informal employment and income for hundreds of thousands of Tanzanians. The Tanzanian government needs to harness the entrepreneurial talent in the sector to broaden the tax base and diversify sources of tax revenue. But ASM is not merely a subset of LSM – it is an entirely different occupation with its own distinct methods, technologies and social dynamics. This does make the sector more difficult to govern than LSM, but that does not justify the current absence of meaningful governance. Transformation towards enhancing human welfare and reducing negative environmental externalities will require, first, re-conceptualising the sector and the people involved. Second, it will require a workable support strategy. Here the government will have to work with private sector partners and organisations such as the World Bank¹³¹ to accomplish two important things. The 2010 Mining Act will have to be updated or amended to lower the practical barriers to entry for miners who are currently categorised as informal. Where it is patently unrealistic to expect them to comply with all the regulations that owning a licence entails, the law should adapt to the reality. A support strategy could then supplement legislative change with new ways of rolling out technologies that improve the health and productivity of informal miners. Technologies that simultaneously reduce threats to the environment should be prioritised. In the short term, it appears that providing mercury-recycling retorts, for instance, will constitute the most efficient allocation of capital. But rolling out and scaling up these kinds of projects should be done carefully, with genuine community participation and built-in monitoring and evaluation systems. The strategy should also attempt to increase the positive spillovers of the sector. For instance, agriculture investment may yield a viable return through feeding a healthier cohort of mineworkers. This would have the dual effect of building food security and diversifying the local economy.

131 A pilot project to this effect is currently underway, led by the World Bank. See World Bank, 'Innovative small-scale mining initiative kicks off in Tanzania', 24 November 2014, <http://www.worldbank.org/en/news/feature/2014/11/24/landmark-small-scale-mining-initiative-kicks-off-in-tanzania>, accessed 18 October 2016.

In the final analysis, Tanzania needs to continue to diversify its economy, broaden its tax base and improve its education system. New technologies must be timeously adopted and a business-friendly bureaucracy crafted. If it fails to accomplish these things, it is likely to be left behind in a world that is changing fast. The talent and entrepreneurship found in the informal mining sector should be harnessed for improving welfare and minimising negative externalities.

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