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Accepted Version

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Hilson, G., Mondlane, S., Hilson, A., Arnall, A. ORCID: <https://orcid.org/0000-0001-6218-5926> and Laing, T. (2021) Formalizing artisanal and small-scale mining in Mozambique: concerns, priorities and challenges. *Resources Policy*, 71. 102001. ISSN 0301-4207 doi: <https://doi.org/10.1016/j.resourpol.2021.102001> Available at <https://centaur.reading.ac.uk/95641/>

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To link to this article DOI: <http://dx.doi.org/10.1016/j.resourpol.2021.102001>

Publisher: Elsevier

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Formalizing Artisanal and Small-Scale Mining in Mozambique: Concerns, Priorities and Challenges

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Acknowledgements

Funding for this research was provided by the International Growth Centre, under the grant *Formalizing Small-Scale Mining in Rural Mozambique: Issues, Challenges and Ways Forward* (MOZ-19016). The authors would like to thank all of the interviewees for taking time out of their busy schedules to participate in the research. The authors would also like to thank the editor of *Resources Policy*, an anonymous reviewer, Dr Claudio Frischtak and the International Growth Centre Mozambique staff for comments on previous drafts of this paper. Needless to say, any errors this paper may contain are the sole responsibility of the authors.

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Abstract

This paper reflects critically on efforts made to formalize artisanal and small-scale mining (ASM) – low-tech, labour-intensive mineral extraction and processing – in Mozambique. Drawing on findings from interviews with policymakers, representatives from ASM associations and consultations with 200 individual miners, the paper captures the details of the country’s ASM formalization experience. Findings reveal that despite showing considerable promise at first, the drive to formalize ASM in Mozambique, which spans three decades, has lost considerable momentum. A bureaucratic licensing scheme, overlapping responsibilities at the *Estatuto Orgânico do Ministério dos Recursos Minerais e Energia* (MIREME), and a shortage of information about miners have contributed to this slowdown. The themes underpinning the efforts to formalize ASM in Mozambique are not new but the case itself has its own unique nuances and storylines.

1. Introduction

This paper reflects critically on efforts made to formalize artisanal and small-scale mining (ASM) – low-tech, labour-intensive mineral extraction and processing – in Mozambique. Over the past two decades, a burgeoning body of literature (e.g. Childs, 2014; Seccatore et al., 2014; Spiegel, 2015; Mutemeri et al., 2016; Hilson et al., 2018; Buss et al., 2019; Sauerwein, 2020) has emerged which showcases ASM’s importance in sub-Saharan Africa. Studies produced over this period have shown that the sector provides a much-needed source of income to otherwise-jobless people; millions of families across the region engage simultaneously in ASM and subsistence agriculture, often seasonally; and that despite most of its activities being carried out informally, the sector makes significant contributions to regional mineral production. The evidence suggests that ASM could be the most important rural nonfarm activity in sub-Saharan Africa. Donors, host governments and the NGO community are now increasingly acknowledging this but continue to ignore calls to make the sector more of a focal point of the region’s development strategy. Consequently, the main development policy architecture in place in sub-Saharan Africa, including the New Economic Partnership for African Development (NEPAD), the African Strategy on Climate Change, and programs linked to the Sustainable Developments Goals (SDGs), continue to promote poverty alleviation strategies which fail to take into consideration ASM’s economic importance.¹

Despite boasting one of the most dynamic ASM economies in the Southern African Development Community (SADC), Mozambique has been heavily overlooked in regional assessments of the sector. This case nevertheless offers valuable lessons for donor bodies and host African governments that are struggling to formalize ASM – in particular, activities tied to the extraction of gold – and which fail to understand why this challenge persists in the first place. In many ways, the story in Mozambique is not new. It contains elements that speak to a challenge that grips the wider region today: how to formalize ASM, given the current orientation of development policies, regulatory frameworks and the priorities of host governments. Mozambique is a poor country with innumerable developmental challenges, as evidenced by its ranking of 180 out of 189 countries on the latest Human Development Index, on which it underperforms on most social and economic indicators (Table 1). A formalized ASM sector, however, could alleviate significant poverty in, and deliver economic growth to, numerous rural areas of the country. The government seems uniquely-placed to do this because unlike other countries in sub-Saharan Africa, the geology here is mostly unappealing to capital-intensive large-scale gold mining companies; there is little concern about competition emerging between miner operating at different scales over (gold) mineralized-lands. Presently, all gold produced in Mozambique is mined on an artisanal and small scale, which *should* make formalization fairly straightforward.

Momentum to formalize ASM in Mozambique was steadily building in the 1990s but has since diminished considerably. This is due to the country quite unexpectedly transforming itself from a struggling agrarian economy – a direct consequence of it emerging from decades of civil violence in the early-1990s – into one of Southern Africa’s most important producers of coal, gemstones (in particular, ruby) and natural gas. Despite having minimal local economic impact, these capital-intensive activities have enormous appeal for the national government because they generate significant revenue in the form of taxes, royalties and permit fees. The lesson from Mozambique is that if formalization of ASM is not quickly established as a priority, developmentally, and anchored in national poverty-alleviation strategies, the idea can quickly take a backseat to competing interests.

¹ The sector has been mentioned in some countries’ (e.g. Ghana and Tanzania) Poverty Reduction Strategy Papers (PRSPs), as well as the Africa Mining Vision, a mining sector-led developmental blueprint devised by African mine ministers. See ‘Africa Mining Vision’, www.africaminingvision.org/ (Accessed 4 January 2020).

Drawing on findings from recent fieldwork, the discussion that follows shares details about the dynamics of ASM in Mozambique, as well as examines the sector’s impacts and needs, framed against the background of ongoing developments in the country’s economy, and the sector’s policy treatment more generally. The paper begins in Section 2 by briefly revisiting the main debates on ASM and development in sub-Saharan Africa. The remainder of the paper profiles the case of Mozambique, beginning in Section 3, which briefly outlines the methodology adopted as well as the objectives guiding the fieldwork undertaken. Sections 4 shares findings from the research, profiling both institutional and grassroots perspectives on ASM, with special emphasis on issues pertaining to formalization. Section 5 offers critical reflections on the position of the Government of Mozambique on ASM, in particular, the measures it has taken to facilitate the sector’s formalization. Section 6 concludes by summarizing briefly the points put forward in the discussion and prescribes policy recommendations for facilitating ASM formalization in Mozambique and potentially other countries in sub-Saharan Africa pursuing a similar agenda.

Table 1: Basic economic and social indicators for Mozambique

Indicator	Mozambique	
HDI	Index: 0.446	Ranking: 180
Health	Life expectancy at birth	60.2
Education	Expected years of schooling	9.7
Income/Composition of Resources	Gross national Income (GNI) per capita (2011 PPP \$)	1,1154
Inequality	Inequality -adjusted HDI	0.309
Gender	Gender Development Index	0.901
Poverty	Population in multidimensional poverty headcount (%)	72.5
Work, employment and vulnerability	Employment to population ratio (% ages 15 and older)	76.0
Human Security	Homicide Rate per 100,000 people	N/A
Trade and Financial Flows	Exports and imports (% of GDP)	117.3
Mobility and Communication	Internet users, total (% of population)	10.0
Environmental Sustainability	Carbon dioxide emissions, per capita (tonnes)	0.3
Demography	Total Population (millions)	29.5
Socio-economic sustainability	skilled labour force (% of labour force)	7.1

Source: UNDP, 2019

2. Artisanal and Small-Scale Mining in sub-Saharan Africa: A Brief Review of Key Policy Debates, 1990-Present

In just three decades, ASM has emerged from virtual anonymity to become one of the most contested and polarizing subjects in the field of international development. Throughout the 1990s, the sector was predominantly thought of as an industry comprised largely of rogue entrepreneurs looking to earn money quickly. When the sector was mentioned, it was generally projected in growth and industry terms; it barely featured in discussions on livelihoods and poverty alleviation. Donor assistance provided to ASM in the 1990s, therefore, mostly took the form of technical support (Hollaway, 1991;

Jennings, 2003), earmarked to establish funds to support operators or schemes capable of financing the distribution of equipment such as pumps, generators and crushers to sites.

The orientation of research conducted on ASM in sub-Saharan Africa changed radically following the World Bank-hosted *International Roundtable on Artisanal Mining* in Washington DC, May 1995, where the sector was referred to in an international forum for the first time as a 'poverty-driven' activity (Barry, 1996). This label, and the way in which delegates portrayed the sector as a source of income for hundreds of thousands of subsistence rural families, would spawn a new body of research on ASM. In the case of sub-Saharan Africa, work published from this point forward has provided insights on the social and livelihoods dimension of ASM. Issues such as the sector's gender-related concerns (Bashwira and Cuvelier, 2019; Brottem and Ba, 2019; Buss et al., 2019) and its linkages with rural agriculture (Hilson, 2016; Maclin et al., 2017; Mkodzongi and Spiegel, 2019) have received considerable coverage. These positive impacts, however, have been overshadowed by analysis of the sector's environmental footprint, in particular, pollution from mercury, which is used to amalgamate gold and when dispensed into the natural environment, methylates and bioaccumulates, posing a threat to human health. The problem in sub-Saharan Africa is that most ASM activities are informal, and that donors and host governments are generally unwilling to dialogue directly with operators over concerns of being seen as endorsing illegality. But as this section of the paper explains, in a bid to frame the Mozambique case, the policy frameworks and laws in place for ASM in the region are, in large part, fuelling the sector's informality. The section reconnects with the main arguments in support of formalizing ASM in sub-Saharan Africa. It furthermore revisits the main explanations provided in the literature for why such a sizable share of ASM activities across sub-Saharan Africa are found and often rooted in the informal economy.

In 2000, officials at Mozambique's now-defunct Directorate of Mines (DNM), with support from the World Bank, conducted a national baseline of ASM activities (Kazilimani et al., 2003). The purpose of the baseline was to map the organizational structures (production, processing and marketing) of ASM, to identify constraints and problems affecting the sector's development, to assess its impacts on livelihoods, and to identify ways in which to better regulate and manage operations. The study was conducted in four provinces, each of which contains high concentrations of artisanal gold and gemstone mining activities: Manica, Tete, Niassa and Nampula. Across sub-Saharan Africa at this time, momentum was steadily building to formalize ASM, largely because of the unfavourable spotlight it was receiving for its environmental impacts and interface with large-scale mining activities. On the latter point, several countries in the region had, in the 1990s and early-2000s, implemented major mining sector technical assistance projects supported by the World Bank (Table 2). Goals linked to formalizing and supporting ASM were enshrined in each project but mostly took a back seat to work aimed at attracting foreign investment to develop large-scale mineral exploration and mining facilities.

To avoid complications, Davidson (1993) explained at the time, 'Governments must be prepared to move beyond the establishment of legal frameworks, [and] to identify deposits and areas amenable to small-scale development, including the preliminary evaluation of their technical and economic viability at different levels of operation. Security of tenure should be respected in such areas' (p. 317-318). Failure to do this, however, has led to the mass demarcation of mineral-rich lands as concessions to foreign parties, leaving few opportunities for ASM parties to secure titles to work their own plots. Reflecting on what would unfold in sub-Saharan Africa more broadly as a result of failing to prioritize ASM concerns at an early phase of reform, officials at the United Nations Economic Commission for Africa rightly pointed out that 'the process of applying for mining rights usually favours LSM [large-scale mining] companies to the extent that ASM frequently operates without security of tenure'. Echoing points raised by Davidson (1993), they furthermore stressed that in order to adequately

address this, there must be 'a legal regime that gives ASM rightholders enough land, duration of rights and security of tenure' (UNECA, 2011, p. 2-3).

Table 2: Major mining sector reform projects implemented in sub-Saharan Africa, 1990-2006

Fiscal Year	Country	Project Name	Financing (US\$ millions)
1993	Mali	Mining Sector Capacity Building Project	6
1995	Ghana	Mining Sector Development & Capacity Building	12
1995	Tanzania	Mineral Sector Development	13
1996	Zambia	Economic Recovery & Investment Promotion TA	23
1997	Burkina Faso	Mining Sector Capacity Building & Environmental Management Project	21
1999	Zambia	Public Sector Reform & Export Promotion	173
2001	Mozambique	Mineral Resources Project	18
2002	DR Congo	Economic Recovery Credit (Begin restructuring of mining sector)	100*
2003	Madagascar	Mineral Resources Governance Project (2007)	32+8
2003	Mauritania	2nd Mining Sector Capacity Building	18+5 (2006)
2003	Ethiopia	Energy Access Project (Mining Sector Reform)	2.5*
2003	Burkina Faso	Competitiveness and Enterprise Development (Mining Sector Reform)	3.9*
2004	Uganda	Sustainable Management of Mineral Resources	25+5 (2009)
2005	Nigeria	Sustainable Management of Natural Resources	120
2005	Sierra Leone	4th Economic Rehabilitation & Recovery Project (Capacity Building & Regulatory Reform)	3.8*
2006	DR Congo	Transitional Support for Economic Recovery (Improve mining sector governance)	13.5*

Source: McMahon, 2011

Formalization in the context of ASM is more than just licensing. Permits and registration are, indeed, a starting point, and undoubtedly a key to catalyzing changes in the lives of miners, opening up new doors that could not previously have been opened. Formalization in the context of ASM, however, must be seen as a *process*

...that seeks to integrate [artisanal and small-scale gold mining] ASGM into the formal economy. The process of formalization includes the development or adaptation of mining (and other) laws or policies to address the challenges of ASGM. A well-designed formalization process generates the enabling conditions for accountability within the sector so that it can ultimately be integrated into the formal economy. Formalization can only be successfully achieved if programmes and public policy deal with the different dimensions of ASGM activities simultaneously and in an integrated way. Legalization is just one dimension of the process of formalization. [UNEP, 2012 p. 2]

The problem with ASM is that it has always been left behind, side-lined in favour of other economic interests. In sub-Saharan Africa, this began with mining sector reform and technical assistance projects, the designs of which were heavily informed by the World Bank's seminal document, *A Strategy for African Mining* (World Bank, 1992), drafted in the early-1990s. The document called on regulators to treat ASM in the same ways as large-scale mining, despite the two being very different industries, from the types of people they employ through to the markets they service. Experiences from sub-Saharan Africa in large part led officials at the International Labour Organization (ILO) to declare, in what has become the organization's own landmark report, *Social and Labour Issues in Small-Scale Mining* (ILO, 1999), that:

Small-scale mining is bedevilled with too many regulations that are mostly designed to constrain it and too few inspectors to ensure that they do. There is therefore little incentive for small-scale mines to conform, particularly if the risks of being caught and of sanctions being applied are minimal. If small-scale mining is to be encouraged to operate legally, legislation must be (at least) even-handed in allowing small-scale miners access to suitable land for prospecting and mining activities. It must be "user friendly" as far as the issuing of permits and the granting of licences are concerned - permits that provide clear security of tenure for a reasonable period so that small-scale mining can become established. [p. 87]

The ASM sector's continued peripheral position on the development agendas of so many countries in sub-Saharan Africa and elsewhere explains why, despite its economic importance, it was heavily-overlooked during the planning stages of the Millennium Development Goals (MDGs) and subsequently, the SDGs. Dedicated initiatives for ASM, such as the now-defunct CASM platform and DELVE,² are therefore launched with the knowledge of there being a real risk of operating in isolation, and outside of broader economic and development frameworks.

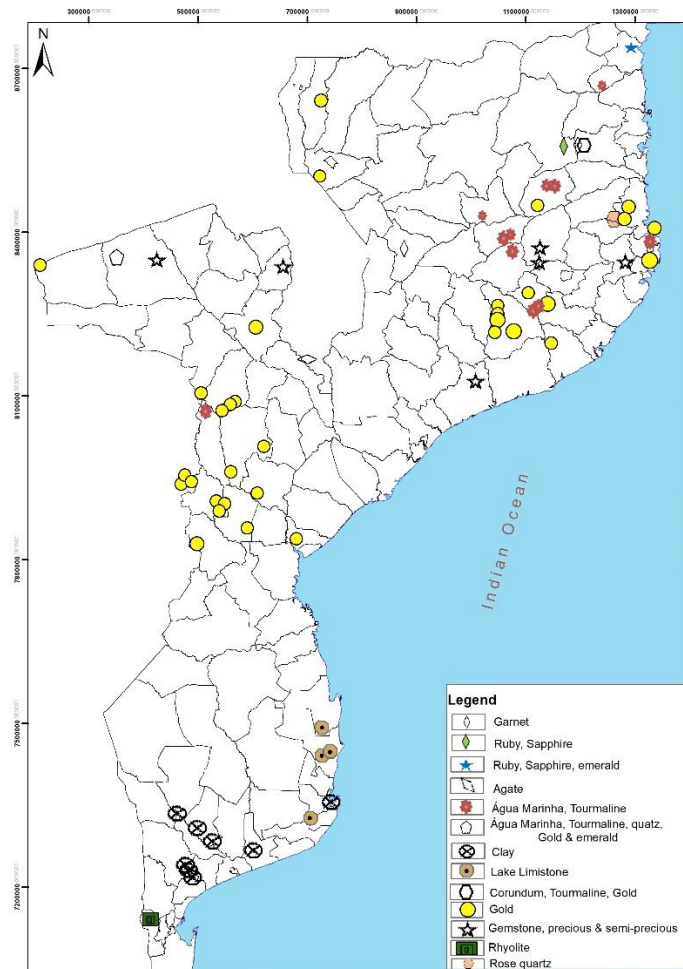
This explains why extensive analysis of ASM's embeddedness in rural sub-Saharan Africa (e.g. Oramah et al., 2016; Persaud et al., 2017; Mutagwaba et al., 2018), detailed insights on how it is interconnected with agriculture (e.g. Maconachie and Binns, 2007; Kamlongera, 2011), and its contributions to the region's mineral production (Mawowa, 2013; Tychen et al., 2018), have failed to stimulate the wholesale changes in policy needed to make formalization a reality (Hilson, 2020a, b). The sector continues to take a backseat to large-scale mining. Since publication of the ILO report, detailed accounts have emerged about how, across sub-Saharan Africa, a shortage of mineralized land, bureaucratic licensing schemes and exorbitant costs associated with securing the requisite permits are fuelling persistent informality in the sector (Hentschel et al., 2002; Van Bockstael, 2014; Hilson et al., 2014; Spiegel, 2015; Patel et al., 2016; Siwale and Siwale, 2017). Trapped in the informal economy, the sector's operators have come under the spotlight it seems for mostly the wrong reasons, including the environmental impacts of operations, the rampant smuggling that often occurs at sites, and the numerous health and safety concerns linked to activities. These are the hallmarks of informality but which could be addressed with the improved monitoring and regulation that typically accompanies formalization – at least in theory.

Mozambique, however, may be uniquely positioned to overcome these challenges largely because, as hinted earlier, its geology is incapable of supporting a burgeoning large-scale gold mining economy. This means that the government should not be preoccupied with attracting foreign companies.

² Established in 2000 and initially housed at the World Bank, CASM aimed to 'reduce poverty by building sustainable communities in those countries where artisanal and small-scale mining is an important economic activity with positive potential contributions to development when the right conditions and incentives are created for all major stakeholders' (see 'The World Bank', <http://siteresources.worldbank.org/INTOGMC/Resources/CASMFACETSHEET.pdf>, Accessed 4 January 2020). DELVE, which is also funded by the World Bank, is a data-sharing platform, established to encourage the wider circulation of information of all types on ASM.

Moreover, all ASM is relatively well-controlled or has the potential to be because the law permits activities to only take place in ‘designated areas’ (Figure 1). The subsequent sections of this paper weigh in on Mozambique’s experience with formalizing ASM and reflect critically on the state of the sector more broadly.

Figure 1: Designated areas for ASM activities in Mozambique



Source: map produced by authors

3. Methodology

Research was conducted in Mozambique to strengthen the case for developing a viable strategy for formalizing and supporting the country’s ASM sector. As indicated, the dynamics of ASM in Mozambique have been heavily-overlooked in the literature. Only Mondlane and Shoko (2003), Dondeyne et al. (2009) and Dondeyne and Ndunguru (2014) have broached the subject in writing. Initially, it was planned that a team of four researchers would visit Mozambique, with a view to broadening understanding of the institutional and policy machinery in place for ASM in the country. Arrangements were made, via email, with key government officials based in the country capital of Maputo; each was briefed about the research, and interviews were arranged. Representatives from all government bodies with a stake in regulating and/or administering policy to ASM were identified prior to being approached (Table 3). Before conducting the research, however, the opportunity arose to visit Manica Province, to interview miners and representatives from ASM cooperatives. Visiting

Manica, arguably the most important small-scale gold mining section of Mozambique, was quickly identified as a priority; plans were hatched to include it in the research.

Table 3: Institutions with regulatory/policymaking responsibilities for ASM in Mozambique

	Organization	Specific Mandate Related to ASM (by law or ministerial decree)
Ministry of Mineral Resources and Energy (MIREME)	National Directorate of Geology and Mines (DNGM)	a) Draft and prepare policies, strategies, programs, plans, standards, guidelines and regulations for the development of geological and mining activity in Mozambique and ensure its implementation b) Ensure the promotion and monitoring of ASM c) Ensure the licensing of Mining Activities including exploration
	National Institute of Mines (INAMI)	a) Receive, prepare, organize and evaluate the dossiers for attribution of licenses for exploration, exploitation of Mineral Resources following the regulations of the Mining Law. b) Promote, support (assist) and control the ASM in order to minimize its negative social and environment impacts
	General Inspection of Mines (IGREM)	a) To Inspect and supervise the fulfilment of the regulations and standards prescribed by law and promote good practices b) Inspect and audit the mining installations, transport, distribution and commercialization of mineral products
DIPREMES	Provincial Directorate of Mines and Energy	To promote the ASM in their jurisdiction and disseminates good practices that minimize social and environmental negative impacts
EMEM	Mozambican Exploration and Mining Company	To promote the commercialization of mining products including those from the ASM (mainly, gold and gemstones)
MITADER	Ministry of Land, Environment and Rural Development	No specific mandate on ASM, but is responsible for approving the Environmental Licenses; attribution of surface rights (DUAT). And promote good environmental practices.
MISAU	Ministry of Health	No specific mandate on ASM, but is responsible for promoting public health and considering that some of the practices of ASM may impact the public health (such as the use of mercury in processing of gold, etc.)
MEF	Ministry of Economy and Finance	No specific mandate on ASM, but is responsible for capturing the earnings from all sectors, including those from ASM
MIGCAS	Ministry of Gender, Child, and Social affairs	No specific mandate on ASM, but is Mandate of the Ministry to promote and implement policies on gender and children and eliminate child labour in the country.
MITESS	Ministry of Labour and Social Security	No specific mandate on ASM, but is mandate of the Ministry to draft and implement policies on labour and social security in Mozambique.
MOPHRH	Ministry of Public Infrastructures, Housing and Hydric Resources	No specific mandate on ASM, but is Mandate of the Ministry to implement policies on adequate housing and social infrastructures (roads, bridges, schools, hospitals, dams, rural and urban water supply, etc.)
MINEDH	Ministry of Education and Human Development	No specific mandate on ASM, but is responsible for human development and education in Mozambique
ASM Associations		There are formal associations and informal associations which have the mandate to formalize the ASM sector and where possible upgrade the artisanal miners into small scale miners (by forming cooperatives or small enterprises).

Following an initial round of interviews in Maputo, the team travelled to Manica, where five mining associations (cooperatives) were visited: Mimosa Association, Munyena Association, Zambuze, Tsetsera Mine (association), and Bandire Association in Sussundenga. Moreover, 200 individual small-scale miners were interviewed at three ‘designated areas’ – Munyena, Tsetsera and Mimosa – in Manica Province. Some of the miners interviewed were in possession of an artisanal mining license (*Senha Mineira*) and therefore legally authorized to work in these zones, whilst others were not. Each was asked to share details about his/her circumstances, including why they decided to mine, the impact it has had on their lives, and their experiences securing licenses. The survey instrument used was adapted from the ‘Survey Tool’ available on the ASM DELVE platform.³ These data were recorded on tablets and subsequently uploaded on to a central spreadsheet. Following the visit to Manica, the policymakers consulted previously were once again visited.

The analysis that follows draws on findings from this survey, interviews and consultations to paint a picture of how ASM formalization is being approached in Mozambique, and what miners’ positions are on the government’s strategy. It draws *exclusively* on the qualitative data to generate storylines around miners’ experiences and ASM formalization that could inform policy in Mozambique and potentially, elsewhere in sub-Saharan Africa. All quotations presented are drawn, verbatim (translated mostly from Portuguese into English), from these interviews, and throughout, an attempt is made to anonymize respondents. To preserve anonymity, all of the respondents, from government officials to miners, were assigned numbers.

4. Building the Case for Formalization of ASM in Mozambique

As an ASM census has not been carried out in Mozambique since the baseline study, it is difficult to estimate, with precision, exactly how many people are engaged in the sector in the country. Based on the latest estimates (Dondeyne and Ndunguru, 2014), there are at least 150,000 men and women across the country mining a range of minerals on an artisanal and small scale. At least 60,000 of these people are mining gold.

There is presently no large-scale gold mining in Mozambique; all of the country’s gold is produced by these artisanal and small-scale miners because most deposits are simply insufficient in quantity for capital-intensive companies to work profitably. This, however, has not hindered gold production, which has climbed steadily over the past two decades (Table 4). Only the state-owned EMEM and individual licensed miners (approximately 250) have the legal authority to purchase gold in Mozambique. Whilst the sector’s informality has sparked fresh concerns about a network of illegal buyers, there is a chance that the impact of this is being offset by the gold regularly smuggled in by miners from neighbouring Zimbabwe, where the state is cracking down on informal activities, often calling on the military to close unlicensed operations.⁴

³ ‘Survey’, <https://delvedatabase.org/uploads/resources/ASM-Survey-Questionnaire-English.pdf> (Accessed 15 January 2020).

⁴ ‘Zim’s cash crisis fuels gold smuggling into Mozambique’, <https://furtherafrica.com/2016/04/27/zims-cash-crisis-fuels-gold-smuggling-into-mozambique/> (Accessed 4 January 2020).

Table 4: Gold production in Mozambique⁵

Year	Ounces
2015	6,462.30
2014	7,780.48
2013	6,333.70
2012	2,925.72
2011	5,722.83
2010	3,568.73
2009	3,407.98
2008	16,429.03
2007	9,580.92
2005	2,732.81
2004	1,929.04
2003	1,929.04
2002	1,929.04
2001	964.52
2000	964.52
1998	610.86
1997	482.26
1996	192.90

Gold panning activities are highly concentrated in Manica Province, where a greenstone belt of rocks runs through to neighbouring Zimbabwe. Although now regarded as the epicentre of Mozambique’s ASM sector, it has only been since the late-1990s that activities here have experienced precipitous growth. Before becoming an exclusively artisanal and small-scale gold mining economy, Manica hosted two large-scale concessions, both held by Manica Gold Mines. The company, however, was unable to maintain any level of consistency during the country’s protracted civil war. With local communities secretly engaging in artisanal mining at the time and selling gold abroad, initially in Manica and subsequently in places such as Tete, Niassa, Sofala, Zambezia and Nampula provinces, Manica Gold Mines eventually abandoned its concessions. This would shape and ultimately give rise to the ASM sector rooted in Mozambique today.

In Mozambique, the case for formalizing ASM with a view to showcasing it more in national development strategies is little different than anywhere else in sub-Saharan Africa but it has its own distinctive flavour and a unique story worth sharing. Drawing heavily on findings from the research, this section of the paper builds the case for intensifying efforts to formalize and support ASM in Mozambique.

4.1 An Interconnection with Agriculture

There is an abundance of evidence which points to ASM and subsistence farming being interlocked across sub-Saharan Africa. Mozambique is no different, although the context in which this diversification is taking place is slightly different and therefore warrants closer examination.

In 1992, Mozambique emerged from 30 years of civil war, and began the unenviable task of laying the groundwork for what has been an extensive period of recovery and reconstruction. The most recent

⁵ ‘Mozambique’, www.24hgold.com/english/stat_country_detail.aspx?pays=Mozambique&deid=24470B1670 (Accessed 4 December 2019).

episode of violence (the 1981-1992 war) claimed one million lives, forced one third of the country's estimated 13-15 million population to abandon their homes, and cost approximately US\$20 billion in damages (Hanlon, 2010). Comprehensive donor packages have helped to stabilize Mozambique on many fronts but have also made it one of the most aid-reliant economies in the world. At the conclusion of the civil war, significant humanitarian assistance and relief arrived, so much so that by the end of the 1990s, Mozambique would emerge as Africa's single largest recipient of foreign aid (Chichava et al., 2013).

What resonated powerfully with donors pledging assistance to Mozambique early on was peasant agriculture, specifically, the idea of reviving it. The country's history of family farming extends back many generations. Kyle (1991) offers a detailed explanation of this tradition, explaining how at independence in 1975 and prior to the country's first episode of prolonged civil violence in 1977, 80 percent of the Mozambican population was engaged in – mostly subsistence – agriculture, growing a variety of staple crops. The most important of these was maize, harvested in the drylands of the south and at higher elevations in the north and west. The country's two major export tree crops, cashews and coconuts, are grown in the east of the country. Cotton is also grown at elevation in the north; rice is cultivated near the Zambezi delta; and sorghum and millet are produced everywhere. As Marshall (1990) points out, 'Historically the family sector had been the backbone of agricultural production in Mozambique, including cash crops for export' (p. 29). The decision made by the government in the 1990s to assist state-run farms as opposed to peasant producers, however, reoriented the country's agricultural sector permanently. No longer supported, peasants retreated and subsequently shifted from being market-driven to more subsistence and household-oriented in their production and goals.

Where Mozambique differs from most cases in sub-Saharan Africa is in the area of food security. The data paint a very clear picture: an estimated 63 percent of Mozambique's population lives in rural areas, and the country is home to 3.2 million smallholder families.⁶ It is, however, one of the most flood- and drought-prone countries in sub-Saharan Africa; when mapped on to a turbulent political history, these extreme climatic events are in large part why Mozambique struggles on most social and economic development indicators. Foley (2007) reflects on the impacts these phenomena have had on local populations:

The worst droughts were recorded between 1980 and 1983, which affected up to six million people. The two worst floods were in 2000 and 2001, which affected up to four and a half million. It has also been hit by a number of cyclones, the worst of which was in 1994, which affected two and a half million people. The country has a tropical climate with two seasons: its wet season is from October to March, and its dry season is from April to September. The Zambezi River, which runs through central Mozambique, is the fourth-largest river basin in Africa and drains water from parts of Tanzania, Malawi, Zambia, Angola, Namibia, Botswana and Zimbabwe, as well as from Mozambique itself. As the 'last stop' before the sea, Mozambique is highly vulnerable to changes in the water levels that occur further up the main river and its tributaries. Towards the end of the 'wet season', in January, February and March, the river often swells to over twice its average size (in terms of water flow), while by the end of

⁶ 'Rural population (% of total population) - Mozambique', 2019 figure, <https://data.worldbank.org/indicator/SP.RUR.TOTL.ZS?locations=MZ> (Accessed 13 January 2021); 'FAO in Mozambique', www.fao.org/mozambique/fao-in-mozambique/mozambique-at-a-glance/en/#:~:text=Agriculture%20remains%20the%20main%20economic,farmers%20produce%20the%20remaining%205%25 (Accessed 1 January 2021).

the 'dry season', in August and September, it can shrink to as little as a fifth of its average. [p. 5]

Mozambique is, as Wiegink (2015) aptly puts it, 'a place that has been ravaged by famine, and where food shortages are an annual occurrence, [and where therefore] having enough to eat is one of the most pressing aspects of life' (p. 7).

Despite routinely being plagued by drought, floods and intermittent famine, officials at the World Bank report that annual agricultural growth has *increased* since the conclusion of the civil war. This includes a rise by an average of 6 percent over the period 1996-2003, which again, coincided with the country's two worst periods of flooding, as well as a devastating drought. During the 1999/2000 period, this flooding, which mostly affected Maputo, Inhambane, Sofala, Gaza, Manica, Tete and Cabo Delgado, disrupted the lives of an estimated 154,927 families and destroyed 176,760 hectares of crops. The droughts mostly affected Manica and Cabo Delgado; it was projected that poor rains impacted 31,117 families and destroyed 33,908 hectares of farmland. These developments left the Government of Mozambique with no choice but to appeal to the international community for assistance. On 22 March 2000, it requested US\$100 million (US\$13.2 million for agricultural assistance) to support ongoing emergency activities (Mpofu, 2000).

One popular explanation for the country's increase in agricultural growth is that farmers are cultivating more land, not necessarily increasing their productivity. This is particularly the case with the country's maize, most of which is cultivated by 'better off farmers' (Cunguara and Hanlon, 2010). Another reason commonly cited is farm diversification – how, between 1995 and 2005, the mean number of crops nearly doubled from 5 to 9 per household across all income groups. Improvements in infrastructure achieved in the years following the civil war, it is further believed, stimulated cross-border trade with countries such as Malawi, Zambia, Swaziland and Zimbabwe, with the former alone receiving 90 percent of its maize from Mozambique (Mucavele, 2009).

The data gathered in this research, however, suggest that the complementary nature of ASM and farming may have also contributed to this growth. Surveys conducted with 200 miners across Manica Province reveal a potential interlocking of ASM and farming activities throughout the year. A diversified livelihood portfolio comprising these activities acted as a buffer against the shocks and stresses drought and flooding have brought to the country's agricultural economy. When probed about how artisanal mining impacts farming, many provided short answers. Some examples include 'I cover the harvest costs',⁷ 'I cover the cost of seeds and manure',⁸ 'it has impacted positively [on my farm] because I inject money to buy seeds'⁹, and 'mining sector has positive impact because is the source of finance for my farming activity'.¹⁰ Others were more explicit in their accounts:

I spend 3000 MTZ to cover all the cost in my farming since sowing until harvest. [It] has impacted positively because I can inject money in my farming to increase my production.¹¹

I cover the cost of seed and sowing. During the sowing stage I have to pay workers to do this job...Artisanal mining has impacted my farming activities because with that money is can buy seeds and pay my workers.¹²

⁷ Interview Miner 195.

⁸ Interview Miner 186.

⁹ Interview Miner 187.

¹⁰ Interview Miner 191.

¹¹ Interview Miner 55.

¹² Interview Miner 13.

Whilst these excerpts only scratch the surface, they do nevertheless suggest that ASM is stabilizing otherwise-vulnerable farm families, economically. If unable to bolster their farms with injections of finance secured from ASM directly, these individuals are at least in a position to buy food.

These excerpts, more importantly, reinforce what appears to be a deeply-engrained livelihoods pattern. Nearly two decades ago, Mondlane and Shoko (2003) highlighted the interlocking nature of these activities. They reported how, 'in provinces such as Tete, ASM is entirely seasonal, practised only during the dry season' and that 'In Niassa and Manica, 30% of miners practise the activity seasonally in order to complement earning from agriculture, which is mainly practised in the rainy season' (p. 246). Nearly a decade later, Dondeyne and Ndunguru (2014) shared similar accounts of miners. These authors claimed, *inter alia*, that 'the money they get from the gold helps them to improve their farming, enabling them to buy seeds and fertilizers', and that 'Thanks to the gold mining, people are able to build better houses and buy cattle' (p. 123).

The case for formalizing ASM on the grounds of it improving food security at the local level, therefore, seems clear. At a minimum, these observations warrant further investigation into better understanding the links between farming and ASM in the country.

4.2 A Platform for Wealth Creation

In Mozambique, ASM has all of the looks of a 'poverty-driven activity'. This was first stated explicitly by Dondeyne et al. (2009), who reported that a 'Lack of alternative sources of financial revenues is a primary driving force for getting involved in this hard and often hazardous work' (p 47).

Data collected by the African Development Bank (African Development Bank, 2012) and the United Nations Economic Commission for Africa (UNECA, 2016) underscore the severity of the poverty problem in Mozambique. Since the country's formal economy accounts for only 32 percent of all employment, most of the more than 300,000 new entrants to its labour market each year have been forced to take up marginal work. The economic gains made at the turn of the century which World Bank officials were quick to showcase at the time would be tempered by a stagnating level of poverty reduction toward the end of the 2000s. This was brought about by the struggle to generate employment for these individuals entering the labour force and failure to improve agricultural productivity. There are systemic problems which have contributed to these complications, including how Mozambique has the lowest adult education level in the world, at 1.2 years of formal education, which makes the labour force unappealing for prospective employers; net school attendance rate for secondary school being only 20 percent; and the share of child stunting to overall human exclusion rising by 25.5 percent between 2000 and 2015. Today, over half of Mozambique's population (54.7 percent) lives in poverty (see Table 5 for a summary of Mozambique's unemployment and poverty-related challenges).

Table 5: The state of unemployment and poverty in Mozambique

<ul style="list-style-type: none">• Unemployment in 2014/2015 stood at 20.7 percent• The most prevalent unemployment in 2014/2015 was among females (for the age groups 15-19 years, 20-24 years, 25-29 years, and 30-34 years were 62.3, 46.3, 32.0 and 21.1 per cent, respectively)• The country has a high population growth rate (2.8 percent) and 300,000 new entrants into the labour force each year• Poverty is estimated at 54.7 percent (the percentage of people living below the poverty line of a daily earning of US\$0.65)• The average adult Mozambican has 1.2 years of formal education, the lowest in the world• The country's youth unemployment rate rose 18 percent over the period 2000-2015
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Sources: Data extracted from African Development Bank, 2012; UNECA, 2016

It has been fashionable to single out intensified support to agriculture as the solution to the country's poverty problem, given the impact persistent flooding and drought has had on farming. Passages such as the following have been used to justify prioritizing farm-led support to Mozambique:

Of its 36 million hectares of arable land, distributed across 10 different agro-ecological zones, only 10 percent are farmed and only 50,000 hectares are currently irrigated (60 percent of which in sugar cane plantations)...The devastating effects of civil war, the poor infrastructural base, low productivity levels, vulnerability to extreme weather events, limited investment and weak institutional capacity are amongst the factors frequently put forward as explanations for disappointing performance...The prolonged Mozambican civil war (1976-1992) had a devastating effect in the agricultural economy, destroying the transport network, agro-processing structures and relocating the rural population across the country. [Chichava et al., 2013, p. 5-6]

The view that 'Agriculture is the main source of income in Mozambique, providing income for more than 70% of the population, contributing 31.8% to Mozambique's gross domestic product (GDP) and absorbing 81% of the total workforce' (Cammaer, 2016, p. 6) is also used in support of this position. Joblessness, along with the closure of state-run agriculture and mining companies in Manica and Zambézia provinces in the 1980s and 1990s, would lead to ASM becoming a main source of income in many Mozambican communities. For many families, it generated monies used to support agricultural and cover other household expenses (Dreschler, 2001).

When attempting to engage donors and policymakers about the importance of formalizing ASM, it is crucial to transcend a 'poverty-driven' narrative that scholars have failed to nuance further in recent years. This can be accomplished by highlighting experiences which showcase how the sector is positioning subsistence families to accumulate wealth and stabilize their households. Mozambique is no exception. There are several common themes emerging from the interview data, beginning with how mine income is used to cover basic household expenses, and not just food. As captured by the following excerpts from selected interviews, those consulted explained that mine moneys are used to pay for school fees, improve the quality of their diets, finance housing and for investment beyond agriculture:

Mining activity is good because life has been changed a lot. Now I have a home, food for the family and it is easy.¹³

After I start to work as a miner, I improved a lot with my food [selection]. Now I can buy cheese, butter, bread and other good foods.¹⁴

I have improved a lot because now we eat different types of food. Now we have beef, chicken cheese and other good food.¹⁵

At the village level I don't know but at my house my home improved a lot. I can buy all food I want...¹⁶

I am working as a miner for years and I saw changes in my life. I bought a car, build my house. I don't consider mine activity as my main activity. I am here to get money and invest in other activities.¹⁷

The mining sector has been helping me because I succeed in buying my house and pay my children school fees.¹⁸

The mining activity has impacted a lot in my life because with the money that I earn I am building my house, I am injecting money to my business. I bought a motorcycle.¹⁹

Mining activity is my life. Everything I did in my life was [due to the] grace of mining. I build my house, have my kids, pay school fees and buy car.²⁰

The mining activity has been good for me since I start to work as a miner because it gives opportunity to develop other activities as farms and [other] business. I organized my life building houses using the money I earned as a miner.²¹

Significantly, many of the miners interviewed made the link between what seems to be a perpetual rebuild due to extreme climatic events, on this particular occasion, the weather brought by the cyclone in early-2019. For example, one miner explained that 'the mining sector is good because in few times, I rebuilt my house destroyed by Cyclone Idai',²² whilst another reported that 'The mining sector has been helping me because I am rebuilding my house that was destroyed by Cyclone Idai and I use the money to invest in other activities'.²³ For others, however, there was always a caveat: that whilst appreciative of the moneys ASM generates, the arduous nature of the work cannot be ignored. This is a message that reverberates through the following extracts from selected interviews:

The mining sector is good but need to use human power.²⁴

[The] small-scale miner doesn't have proper material to work.²⁵

¹³ Interview Miner 23.

¹⁴ Interview Miner 20.

¹⁵ Interview Miner 6.

¹⁶ Interview Miner 7.

¹⁷ Interview Miner 29.

¹⁸ Interview Miner 33.

¹⁹ Interview Miner 48.

²⁰ Interview Miner 79.

²¹ Interview Miner 93.

²² Interview Miner 32.

²³ Interview Miner 30.

²⁴ Interview Miner 30.

²⁵ Interview Miner 32.

The small-scale miners have been working under bad work conditions because [they] don't have material and put at risk their health. We don't have masks, boots, gloves and other material.²⁶

It is not easy to work as a miner in Mozambique because we don't have machinery and safety materials.²⁷

The miners have suffered because they don't have proper material to work.²⁸

Mining activity is tough because we work long time without salary and...that occurred during the Cyclone Idai and things got worse. We have been facing problems related to machinery. Everything we do is manual and isn't good for our health.²⁹

We work unsafely. If the government come to help us it would be appreciated.³⁰

But this activity is too hard because of the methods we use to search for gold. We don't have machinery.³¹

The mining sector has developed Manica. Many people who are working as a miner have minimum conditions to live (good house, car) but the miners have faced difficulty during the execution of the job. They don't have material to work. I think they need someone to sponsor them.³²

Small scale miners have faced difficulty related to machinery. We don't have proper material to grind stones that have gold. We use manual method through hammers and is painful.³³

The key takeaways from these interviews here can be summarized as follows. First, given the economic impact ASM is having on the lives of otherwise poverty-stricken masses in provinces such as Manica (i.e., stabilizing farm-dependent families even during periods of extreme weather), there is a compelling case for the government to formalize and support the sector. In addition to generating income for families which they use to support farms and purchase food outright when not producing crops, ASM has positioned them to escape abject poverty, as well as to mobilize the finance used to pay for children's school fees, construct housing, and purchase cars and motorbikes. The transition into ASM, however, has not been easy because of the arduous nature of the work involved – a second key takeaway. Many interviewees called on the government to provide support in the form of training and new equipment. Formalization, would, in theory, increase the government's presence in regulatory and monitoring spheres at the local level. It would also facilitate access to more efficient equipment needed to increase yields and make families more risk averse.

This raises the question: to what extent is the government responding to these concerns and embracing the formalization challenge in the country's artisanal and small-scale gold mining sector? The next section of the paper reflects more closely on this.

²⁶ Interview Miner 33.

²⁷ Interview Miner 70.

²⁸ Interview Miner 80.

²⁹ Interview Miner 81.

³⁰ Interview Miner 88.

³¹ Interview Miner 93.

³² Interview Miner 132.

³³ Interview Miner 136.

5. Formalizing Artisanal and Small-Scale Mining in Mozambique: Critical Reflections

With gold, the problem elsewhere in sub-Saharan Africa is, as already explained, the tendency for governments to demarcate significant tracts of land to (mostly foreign) large-scale mineral exploration and mining companies. A commitment to large-scale mining has yielded millions of dollars in taxes, royalties and permit fees for the region's governments. In countries such as Ghana, Tanzania, Sierra Leone, DR Congo and Liberia, however, this large-scale 'bias' (see Hilson, 2019) has stifled prospective ASM licensees' attempts to secure the permits needed to operate legally, as most land has been awarded to large-scale parties. With a geology unable to support a large-scale gold mining sector, Mozambique should be more actively engaged in formalizing ASM parties. This section of the paper traces the evolution of Mozambique's ASM formalization strategy and offers explanations for why a more innovative approach (to formalizing ASM) has not yet materialized.

5.1 In the beginning...

As indicated, in the late-1990s, momentum was building in Mozambique to formalize and support ASM. The World Bank's ASM baseline had been commissioned (it was carried out in 1999-2000), and most companies exploring for gold had abandoned their work, on account of insufficient mineralization and the (gold) price being so low (see Table 6). The country's Poverty Reduction Strategy Paper, *Action Plan for the Reduction of Absolute Poverty (2001-2005) (PARPA)* (Republic of Mozambique, 2001), provided a source of much-needed inspiration. It featured a dedicated section on mining, with special emphasis on its artisanal and small-scale segment:

Growth in the participation of small national producers in this sector contributes to an increase in the national product and has a significant positive impact in raising incomes amongst poor segments of the population. Activities of small producers in the mining sector nevertheless suffer from a number of efficiency constraints, and possible negative environmental impact. There is thus a need to develop training mechanisms for small producers. [p. 86]

Headlining its *Programme for the Mining Sector* was 'Stimulating small-scale mining'. In line with the results of the baseline, the main objectives of the *Programme* were as follows: 1) to encourage small-scale mining, organizing and legalizing the informal sector and giving it the means to be more efficient and sustainable; and 2) to set up pilot training centres for operators in the provinces of Nampula, Tete and Manica. At this time, the government expressed interest in supporting a formalized ASM sector, a starting point for which was revising a *Mining Law* that had been in place since 1986 (Statutory Instrument Number 2/86). The *Mining Law*, it was proposed, would need to be overhauled to include, among other things, provisions linked to a *Senha Mineira*, or special permit which authorizes artisanal mining activities to take place in pre-designated areas of less than 1000 hectares (Mondlane and Shoko, 2003). This idea became law following implementation in 2003 of Decree N828/2003, which established a framework to assist with regularizing ASM. The idea behind the move was the belief that when registered as an association, individuals will receive mining certificates, which was already happening at the time in the communities of Munhena and Mimosa in Manica District (Dondeyne et al., 2009). This work was done under the auspices of the US\$13.8 million World Bank-funded *Mineral Resources Management Capacity Building Project* (World Bank, 2007). The government also resuscitated, shortly after completion of the baseline, its Development Mining Fund (*Fundo de Fomento Mineiro* or FFM) in the Ministry of Mineral Resources, created by Decree no. 27/88 of 16 February 1988, and updated by Decree no. 17/2005. By 2008, the *Fundo de Fomento Mineiro* was actively financing ASM and purchasing gold from 30 percent of the ASM operators in the central part

of the country.³⁴ Due to inconsistent production levels, however, miners failed to repay their loans and sell enough gold to the facility. Other miners were therefore deprived of the crucial finance they needed to sustain their operations.

Table 6: Exploration and mining companies in Manica Province, 1990s

Exploration Company	Mining Company	End of Activity
Ashanti Goldfields		1999
Trillion Co.		1998
North Rand		1998
	Mincor (Monarch)	1997
	Alma/Benicon	1995
ZIMOS		1998

Source: Dreschler, 2001

Under Subcomponent A3 of the *Mozambique Mining and Gas Technical Assistance Project*, 2014, US\$3 million was allocated by the World Bank to support ASM, presumably in a bid to help bridge the increasing void in sectoral support. Officials appeared to recognize the scale of the challenge that lay ahead:

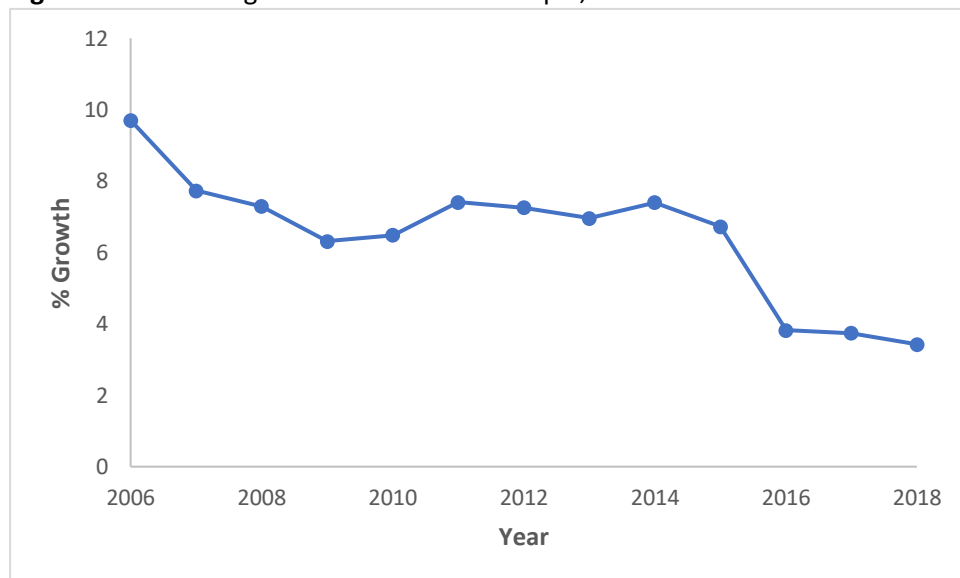
[In Mozambique,] The artisanal mining sector remains underproductive and prone to illegal activity as well as an important source of environmental and social impacts in rural and remote areas...[But] In comparison to its neighbors (such as Tanzania or South Africa), where a lot more was done to improve the artisanal and small-scale mining (ASM) sector, including allocation of special areas and provision of various services, Mozambique is behind in its handling of the ASM sub-sector. While illegal mining has been criminalized in the Mining Law of 2014, there is no specific training or service to address the underlying problem of the inability to obtain licenses and lack of trust in the system or capacity to enforce the law. As a result, ASM illegality remains widespread. Geological data remain difficult to access, and support from Provincial Directorates for Mineral and Energy Resources (DIPREMEs, *Direcção Provincial dos Recursos Minerais e Energia*) is limited to simple inspection functions. Poor infrastructure access combined with the remoteness of many of the areas mined (for example, in remote border areas in the provinces of Niassa, Cabo Delgado, and Manica) has led to minerals being smuggled out of the country through neighboring countries. There is a strong need for the GoM to further develop more specialized services for the ASM sector to improve the quality of these operations given their importance in areas that otherwise have limited employment opportunities. [World Bank, 2017, p. 12]

Why does formalization of ASM continue to be a struggle in Mozambique, despite this support and a very clear idea of what changes need to be made, institutionally, in order to make this happen? Part of the problem is undoubtedly the country's turbulent history. This has led to economic priorities shifting markedly, which has made building continuity across successive national development plans and programs challenging. In the span of only 20 years, Mozambique has transformed from a war-torn economy receiving mostly agricultural and humanitarian assistance into one of the most important producers of coal, gemstones and natural gas in sub-Saharan Africa. The country's 'high economic growth rates' (see Figure 2), reports the African Development Bank, 'have largely been driven by capital-intensive projects, particularly in [these] extractive industries' (p. 1). These

³⁴ 'Mozambique ASM Profile', <https://knowledge.uneca.org/ASM/mozambique> (Accessed 3 April 2019).

commodities account for the vast majority of the country’s exports (Table 7). But whilst the companies engaged in the extraction and export of these commodities have generated revenue for the national government, their activities have had minimal impact on the people who reside in rural areas where, as indicated, peasant agriculture has long been depended on for income and ASM is becoming increasingly important economically. The case for formalizing and supporting ASM in Mozambique, therefore, remains solid, despite being overshadowed by other development projects which are being prioritized by the government.

Figure 2: Economic growth rate of Mozambique, 2006-2018



Source: Data extracted from ‘World Bank Open Data’, <https://data.worldbank.org/> (Accessed 3 June 2020)

Table 7: Merchandise and commodity export dependence, Mozambique

Exports by commodity group (as a share of merchandise exports)	1995	2013-2017	2017
Agricultural commodities	72	21	18
Fuels	4	35	46
Ores, metals, precious stones and non-monetary gold	6	37	31

Source: UNCTAD, 2019

5.2 A ‘Large-Scale Mining Bias’

Prioritizing large-scale resource extraction has resulted in governments in sub-Saharan Africa overlooking the needs of ASM. In Ghana, through Liberia and Sierra Leone, to Zimbabwe, therefore,

this oversight has, more often than not, led to the launch of inappropriate licensing schemes, policies and equipment for the sector's operators (Van Bockstael, 2014; Spiegel, 2015; Hilson et al., 2018).

A similar story is unfolding in Mozambique, elements of which were captured in interviews. When asked why they have not secured the requisite permits, all of the unlicensed miners who responded cited one of three reasons, each of which mirrors those cited in the wider literature on ASM in sub-Saharan Africa. These are as follows: 1) bureaucracy and delays on decisions; 2) excessive costs with registration; and 3) competition with large-scale mining and mineral exploration companies for land. The latter point deserves closer attention because, as indicated, there is very little potential for Mozambique to host an expansive large-scale gold mining sector due to its geology. This, however, has not stopped the government from demarcating large-scale mining and mineral exploration concessions, although most have been awarded to companies targeting minerals other than gold.

A government official confirmed this in an interview. The official explained that 'There is a lack of interest in ASM in general, [and] the government is more focused on large scale mining, and they don't understand the dynamic of ASM and the benefit that could be derived'.³⁵ This, the official further noted, could explain why 'There is no clear guidance from the government regarding small-scale mining regulations'.³⁶ One small-scale miner went as far as to state that 'the government [MIREME] took the area that they gave us before, to give to unknown companies which are not mining'.³⁷ Another complained of there not being any land, explaining that 'Many associations were created but they have no area to do the mining'.³⁸

Whilst the government may not be seizing lands from small-scale miners and redistributing them to large-scale operators, its preference for the latter, a position hinted at during several interviews, is fairly understandable when the sums of money generated are considered. Three examples in particular confirm this. The first is the Montepuez deposits, which were discovered in 2009, and are now being mined by the London-based multinational Gemfields and supports one of the largest ruby mines in the world (Vertiest and Saeseaw, 2019). Gemfields received a 25-year mining and exploration licence from the Government of Mozambique in November 2011 to work an amalgamation of concessions (concession numbers 4702 and 4703, now 4703C), which cover a combined area of 340 km².³⁹ The second is the Moatize Mine in Tete Province, which has been producing coal since September 2011, and is one of biggest investments of the international mining giant Vale. The company's arrival has transformed Mozambique into a world-class coal producer: in 2017, output was in the range of 11,300,000 tonnes (BGS, 2019). Finally, and perhaps most significantly, there is the more than 180 trillion cubic feet of natural gas discovered in the offshore Rovuma Basin since 2010 (Salimo et al., 2020).

These three developments generate (and will continue to generate) massive quantities of revenue for a central government which has, as a result, become progressively detached from the day-to-day activities in the country's rural areas. It has been projected that, over the next 25 years, Mozambique will receive US\$95 billion in revenue – more than seven times its GDP – from its natural gas extraction, specifically from Exxon Mobil Corp's Rovuma project (US\$46 billion) and Eni SpA and Anadarko Petroleum (US\$49 billion).⁴⁰ In addition to this revenue, there are the earnings from Gemfields and Vale: the former contributed, between 2012 and 2017, US\$73 million to the Government of

³⁵ Interview, Government Official 1, Maputo.

³⁶ Interview, Government Official 1, Maputo.

³⁷ Interview, Manager 1, Mining Cooperative.

³⁸ Interview, Manager 2, Mining Cooperative.

³⁹ 'Our Assets in Detail', <https://gemfields.com/our-mines-assets/our-assets-in-detail/> (Accessed 14 January 2020).

⁴⁰ 'Mozambique Expects \$95 Billion of Gas Revenue Over 25 Years', www.bloomberg.com/news/articles/2019-05-16/mozambique-expects-95-billion-of-gas-revenue-over-25-years (Accessed 1 December 2019).

Mozambique in the form of taxes and royalties,⁴¹ and the latter, 3,237,314,877.01 MZN (3.2 billion MZN) in 2015-2016. Total state revenues from extractive industries amounted to 158,509,092,633.00 MZN (158.5 billion MZN) in 2015 and 177,040,500,477.0061 MZN (177 billion MZN) in 2016 (Deloitte, 2018).

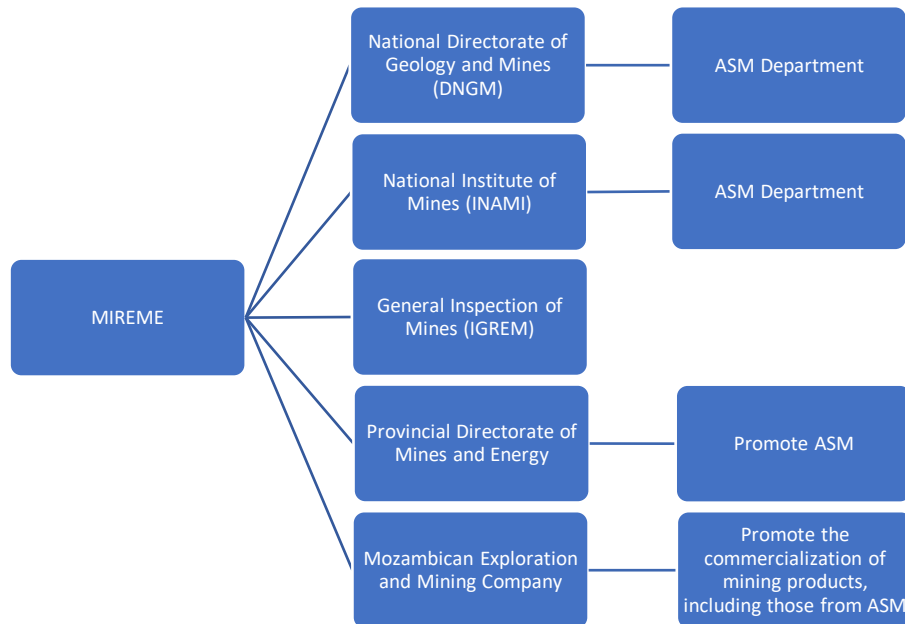
Attracting investment in, and prioritizing the growth of, these capital-intensive activities is certainly crucial for Mozambique's economy. The concern, however, is it is overshadowing and ultimately reducing emphasis on other interventions that are crucial to the country's development, foremost the formalization of ASM.

5.3 Overlapping Institutional Responsibilities

Despite the progress made in the early-2000s toward laying the groundwork for formalizing ASM in Mozambique, its institutions are heavily-disconnected from the realities and needs of the sector. The heart of the problem seems to be the institutional structure which has developed under the auspices of the *Estatuto Orgânico do Ministério dos Recursos Minerais e Energia* (MIREME), itself established following implementation of Resolução No. 14/2015 of 8 July 2015 (Government of Mozambique, 2017). The two key bodies within the MIREME relevant to ASM are the *Direcção Nacional de Geologia e Minas* (DNGM) and the *Instituto Nacional de Minas* or INAMI (see Figure 3). The *Servicos de Projectos, Tecnologia Mineira e Ambiente* (SPTMA), a technical division in INAMI, is tasked with 1) promoting, supporting and supervising, in coordination with other institutions, the exploration and extraction, use and utilization of mineral resources, excluding oil and gas; and (2) promoting, supporting and controlling small-scale mining. The DNGM also operates under the National Directorate of Geology and Mines. It has three divisions or 'sectors', which, much like INAMI, have a national and provincial presence. They are as follows: 1) *Sector Geologia*, which retains a provincial role similar to the INAMI at national level and advises ASM operators on geology and mining techniques, with a view to improving their yields, engineering and mine safety; 2) *Sector Mineração Artesanal*, a provincial version of the DeMAPE (a Maputo-based division of the DNGM that promotes good practices in mining) to provide advisory services in training, extension services and monitoring of ASM; and 3) *Cadastro Mineiro*, which provides the registration system for all permits and licensing, linked to the central Cadastre in Maputo (controlled by INAMI).

⁴¹ 'Our assets in detail', <https://gemfields.com/our-mines-assets/our-assets-in-detail/> (Accessed 4 January 2020).

Figure 3: Organizational structure of the *Estatuto Orgânico do Ministério dos Recursos Minerais e Energia* (MIREME)



Much has been made about the overlapping responsibilities of DNGM and INAMI. The *Good Practices Handbook for Artisanal and Small Scale Mining in Mozambique* (Government of Mozambique, 2017), for example, states that ‘The request for a *Certificado Mineiro* is submitted to the *Instituto Nacional de Minas* (INAMI) or to the Provincial Directorate of Mining and Energy Resources (DPREME)’ (p. 3) It appears, however, that each unit implements its own ASM projects, the latest, at the time of writing, being an ASM census being funded internally by INAMI similar to the World Bank baseline carried out in 1999-2000.

The resulting bureaucracy and confusion have not gone unnoticed by miners. One executive at a small-scale mining cooperative explained in an interview that ‘The mining law is complicated when compared to other laws...for example for agriculture the province governor can issue licenses, however for mining only the central government issues the licenses, [since] it’s a very centralized process’.⁴² Others were highly critical over how a government ‘presence’ fails to materialize into meaningful action:

They (the government) send people here to do some studies and collect data, but they (government) are not serious, they don’t do their job (i.e. issue licenses).⁴³

I go there (Provincial Department of the MIREME) and they don’t respond, we are trying for 6 months and they don’t issue anything. We would like to meet with the people in Maputo to expose our struggles (in-licensing).⁴⁴

Another concern expressed by miners during interviews was the failure of either government institution to provide a roadmap on how to transition to the small-scale stage (*Certificado Mineiro*). Miners were visibly frustrated over these institutions not having a clear path to become formalized small-scale title holders. The root of the problem is the government’s decision to segregate and apply

⁴² Interview, Manager 2, Mining Cooperative.

⁴³ Interview, Manager 3, Mining Cooperative.

⁴⁴ Interview, Manager 4, Mining Cooperative.

separate policy treatment to artisanal licenses (*Senha Mineira*) and small-scale licenses (*Certificado Mineiro*) holders. On the difficulties with transitioning from the former to the latter, one manager of another small-scale mining cooperative explained in an interview that ‘we sat down, face to face, with the Minister but nothing changed’.

The next section reflects critically on the impacts a bureaucratic policy structure has had on the lives of those engaged in ASM.

5.4 Navigating the Bureaucracy and Sharing Stories of the Affected

The officers interviewed at INAMI and the DNGM are in broad agreement that there are significant gaps in knowledge about the sector itself, which makes it challenging to regulate. One acknowledged this in an interview, explaining that ‘they [the government] also recognize that ASM is a very difficult sector to deal with’,⁴⁵ whilst another noted that ‘we don’t know how many people are involved in the ASM’.⁴⁶ What they barely acknowledged, however, is how overlapping regulatory responsibilities are potentially impeding the formalization of ASM.

Neither the officials interviewed at INAMI nor those at the DNGM seemed aware of the problems with the licensing schemes for miners in Mozambique. These are concerns which would be identified and certainly tackled more effectively if both institutions were committed to working collaboratively on ASM issues. It starts with the general strategy being taken to demarcate ‘designated areas’ for artisanal miners or for people who are in possession of a *Senha Mineira* (‘mining pass’) to work. This category of license is open to Mozambican nationals only and allows holders to use simple equipment, provided the level of extraction is small. Those who aspire to hold a *Senha Mineira* must submit a request to the Governor of the Province that includes the following (Government of Mozambique, 2017):

- The complete identity of the petitioner and in the case of a collective, the domicile of the representative responsible;
- The location of the area;
- The mineral resources to be extracted from the area;
- The validity period requested (the maximum is five years);
- Any other relevant information;
- The licence request form duly completed;
- A document showing evidence of the constitution of a national collective with an indication of its capital and its distribution amongst the members;
- Tax reference number;
- Proof of payment of the tax for processing the request; and
- Statement of responsibility for the workers who will be employed at the operation in the ‘designated area’.

The request, however, is sent to INAMI through the DPREME and applicants are told it takes up to 30 days to process. But are these burdensome requirements commensurate with what is being received? Dondeyne (2014) reported that in Central Mozambique, none of the ‘designated areas’ were locations where gold was known to occur, although 65 artisanal gold mines are known to have surfaced in these areas. Interviews with both INAMI and DGEM officials confirmed that the government is not doing any geological assessment with a view to identifying ‘designated areas’. It was explained that the government rather waits for reports of gold discoveries by rural farm families before taking any action, and does so through provincial offices.

⁴⁵ Interview, Government Official 1, Maputo.

⁴⁶ Interview, Government Official 2, Maputo.

This leads to the second and most significant concern, which is the difficulty ASM operators have faced in their efforts to mechanize. Specifically, once those individuals in possession of a *Senha Mineira* have ideas about expanding their operations, they must pursue a new category of license: the *Certificado Mineiro*. Transitioning into the *Certificado Mineiro* requires individual miners to complete a series of difficult tasks, beginning with organizing a cooperative. They must also pay fees, and complete a series of documents, foremost a production plan, for submission to government for assessment, and must also undergo an environmental assessment. Many miners interviewed expressed their frustration over the bureaucracy that needed to be navigated to secure a *Certificado Mineiro* as well as the impoverished policy and institutional framework in place for ASM more generally. Typical responses, in reference to the time delays associated with securing this license, included the following:

Since 2017 [two years ago] we have submitted our license request but the government did not answer us yet. Without certification it is difficult to have a partnership and loan.⁴⁷

Small-scale miners have faced legalization issues. The government takes long time to give us the license. Once they assume the blame, they leave us to explore.⁴⁸

Others, however, reflected more deeply on their fates, weighing the length of time waited against the costs they have had to cover to even put themselves in a position to even kickstart the paperwork for a *Certificado Mineiro*. The following excerpts capture this quite vividly:

I have spent around 200,000 MZN (US\$3000) to gather all the required documents but still have no license. It's too much money, I don't have a salary.⁴⁹

For the Small-Scale license, they requested information (legal requirements), we submitted all of them, the technical capacity, the financial capacity (around US\$10,000) as well as the environmental impact study... we submitted all of it by 2016, and until today [April 2019] we are still waiting for the Small-Scale mining license.⁵⁰

Elsewhere in sub-Saharan Africa, costs have discouraged people from obtaining permits and licenses linked to ASM. In Mozambique, however, it seems to be the delays with applications which explains why, at the time of writing, there were fewer than 30 individuals in possession of a *Certificado Mineiro*, and why most of these were linked to minerals other than gold. One manager at a small-scale mining cooperative was of the view that the delay was due to 'Having low-experienced people in the central government [which] makes it harder in communication, and [why, therefore] they take too long (one to two years) to give any feedback'.⁵¹

Each of the government officials consulted at both INAMI and DGEM were in broad agreement that the licensing process was cumbersome and took time but in almost every case, it was defended on the grounds of it needing to be assessed and evaluated. For example, one government official conceded that there was, indeed, 'uncertainty in applying for the small-scale mining certificate as the process takes too long both for artisanal mining and small-scale mining'. The same official furthermore explained that these individuals 'can apply at the provincial level because the Manica Government signs for the certificate for artisanal mining – construction material, for gold and gemstones...but the physical process must come to IMAN and signed by the ministry [in Maputo]'.⁵²

⁴⁷ Interview Miner 44.

⁴⁸ Interview, Miner 51.

⁴⁹ Interview, Manager 6, Mining Cooperative.

⁵⁰ Interview, Manager 7, Mining Cooperative.

⁵¹ Interview, Manager 8, Mining Cooperative.

⁵² Interview, Government Official 3, Maputo.

Yet, this official seemed to justify the approach, quick to explain that these checks were necessary for verification purposes.

To reiterate, the law requires any person seeking to transition to the *Certificado Mineiro* (a Small-Scale mining license) stage to establish a cooperative, which is a significant undertaking in itself. Whereas the same strategy has failed elsewhere (in Ghana, for example) because individuals are simply unwilling to put their differences aside and work with one another, regardless of the potential rewards with doing so (Hilson et al., 2014), in Mozambique it *is* working. Management at each of the cooperatives visited expressed a willingness to do whatever was necessary to expedite decisions on their applications for the *Certificado Mineiro*, enticed by the lengthy lease time it provides (10 years) and, of course, because it provides a platform to mechanize their operations. Many individuals consulted revealed their reluctance to band together for this purpose and now deeply regret doing so because of the unprecedented waiting times. The following passages capture the seriousness of the situation:

Small scale miners in Mozambique. [It] is not easy because the government doesn't facilitate the legalization process of the mine. We can wait more than five years for the license.⁵³

We first applied for the license in 2007 but we had no feedback. Then we re-applied in October 2018 and we are still waiting [in April 2019].⁵⁴

From the perspective of the miners, the issue, as one put it in an interview, is that 'We just want to operate legally, however, the government is not cooperating'.⁵⁵

The government has yet to respond to these concerns, which is significant because a transition to the *Certificado Mineiro* stage could bring meaningful change to poverty-stricken areas such as Manica. Officials expressed frustration over what was commonly referred to as the 'illegal mining problem' in Mozambique or, as one official put it, how 'The sector is informal because the "garimpeiros" [unlicensed miners], when they discover minerals, they start mining and the more miners join including illegal operators and illegal buyers'.⁵⁶ These comments were in direct reference to how miners who have come together to apply for a *Certificado Mineiro* do not wait for decisions on their applications; they have rather started mining using heavy machinery before being legally-entitled to do so. These comments were also made in reference to how many of the more artisanal groups are avoiding obtaining their *Senha Mineira* ('mining pass') and working in 'designated areas'. The ASM sector could – and should – be a part of this equation based on the evidence of its economic impact it in impoverished areas, in even its current semi-legal state. It seems that institutional fragmentation – epitomized by the sharp division between, and overlapping responsibilities of, INAMI and DGEM – and a generally-impoverished policy framework for ASM have impeded the sector's formalization.

The next, and concluding, section of the paper offers recommendations on how to facilitate formalization of ASM in Mozambique, in light of existing challenges.

6. Conclusions and Recommendations

The research conducted in Mozambique illuminated the unique nuances of the country's ASM formalization experience, which stretches back three decades. Policy treatment of ASM in the country mirrors that of the wider region: in most African countries, there is very little attention being paid to ASM's needs, which is stifling the sector's formalization. In Mozambique, however, in the case of gold,

⁵³ Interview, Miner 52.

⁵⁴ Interview, Manager 9, Mining Cooperative.

⁵⁵ Interview, Miner 45.

⁵⁶ Interview, Government Official 10, Manica.

there are very few competing large-scale mining interests, a major problem experienced in other mineral-rich countries in sub-Saharan Africa, such as Ghana, DR Congo and Tanzania. This is significant because it means that there is very little preventing the government from demarcating 'designated areas' for artisanal and small-scale gold mining more proactively and simplifying a licensing system, which, as this research has confirmed, is excessively bureaucratic and is therefore *discouraging* formalization. In Mozambique, there appears to be a lack of resources available in the public sector to facilitate the necessary changes to make the formalization of ASM a reality. In particular, and an area where the country could learn from mistakes being made elsewhere in sub-Saharan Africa, for most miners, the barriers in transitioning from an artisanal (*Senha Mineira*) to small-scale license (*Certificado Mineiro*) seem insurmountable. This is such a crucial step in ASM formalization because it is the difference between miners being able to freely mechanize or not. There is no quick fix in Mozambique but it is recommended that very simple measures be pursued at first, which map on to what the country is attempting to do, developmentally.

First, it is recommended that a baseline census of ASM is conducted. Communications with government officials revealed that INAMI was in the process of financing one itself. It, of course, would be standalone, given the independent position it now finds itself in at MIREME on issues concerning ASM regulation and support. Yet, its plan to commission a census anyway implies that the resources are available to conduct it, which is a positive sign. It would be worthwhile involving the Ministério de Género, Criança e Acção Social, MGCAS (Ministry of Gender, Child and Social Action) and Ministério da Agricultura e Desenvolvimento Rural (Ministry of Agriculture and Rural Development), which would yield more robust data relevant to rural development. By involving other ministries which look very closely issues such as food security and resilience, the case for formalizing ASM on the grounds of risk aversion in rural areas of the country is bound to gain more visibility and be bolstered.

The leads to a second, more general, recommendation, which is the need to facilitate cross-ministerial collaboration on ASM issues. Building on the previous point, the glaring need here is to repackage ASM as a livelihoods issue: to convince people that the sector is more than simply a rag-tag group of people extracting and processing minerals. The sector has gender, child labour, agricultural, rural development and local economic dimensions that intersect issues being examined by other ministries. Greater participation from different ministries is bound to yield more robust formalization strategies. Packaging ideas around the SDGs – for example, as gender-based interventions, youth employment-related initiative and poverty-alleviation strategies – makes logical sense as it helps to maximize the shelf-life of these ideas in the current donor climate.

The third point is the need for MIREME to collaborate more closely with the Ministry of Land, Environment and Rural Development, and the Ministry of Health on ASM issues. Both are involved in tackling mercury pollution at ASM sites, as the Government of Mozambique has ratified the *Minamata Convention on Mercury*. In April 2015, US\$500,000 was given to these ministries, under the *National Action Plan on Mercury in the Mozambican Artisanal and Small-Scale Gold Mining Sector Project*,⁵⁷ to begin designing a National Action Plan (NAP) which details how the government intends on going about eradicating mercury in ASM. As part of this NAP, comprehensive social assessments are required which are intended to provide a detailed picture of the demographics and social and economic profile of the areas where ASM activity is heavily concentrated. This could go a long way toward further building the case for formalization of ASM by uncovering additional details about the sector's economic importance in the country's rural areas.

Finally, the government must find a way to simplify the licensing system for ASM. As indicated, Mozambique is not unique in this regard: it has proved to be a barrier to formalization across sub-

⁵⁷ 'National Action Plan on Mercury in the Mozambican Artisanal and Small-Scale Gold Mining sector', www.thegef.org/project/national-action-plan-mercury-mozambican-artisanal-and-small-scale-gold-mining-sector (Accessed 4 January 2020).

Saharan Africa. The overlap of some of the mandates on ASM between INAMI and DNGM is no doubt causing delays on applications for both the *Senha Mineira* and *Certificado Mineiro*. Mozambique's ASM operators seem patient, and willing to make the necessary payments to secure the latter, which is a key to mechanizing. There are delays with decisions on licenses but as has been shown in a country such as Tanzania, by fully decentralizing ASM governance to the local or regional level – in this case, a province such as Manica – the time it takes to make a decision on an application for a license is reduced considerably. Other countries such as Ghana, Sierra Leone, Liberia and DR Congo are exploring a similar strategy.

Mozambique certainly has a long way to go if it is to fully formalize ASM, given where the government's priorities currently lie. The recommendations prescribed here, however, provide a blueprint for positive change, and if implemented, would establish a platform for individuals to acquire licenses to mine on an artisanal and small scale more easily, and to expand their operations.

References

- African Development Bank. (2012) 'Mozambique 2012', African Economic Outlook, African Development Bank, Tunis.
- Bashwira, M.-R., Cuvelier, J. (2019) 'Women, mining and power in southeastern Democratic Republic of Congo: The case of Kisengo', *Extractive Industries and Society*, 6 (3), pp. 960-967.
- Barry, M. (Ed.), (1996) 'Regularizing Informal Mining'. A Summary of the Proceedings of the International Roundtable on Artisanal Mining. Organized by the World Bank, 17–19, May 1995, Industry and Energy Department Occasional Paper No. 6, Washington, DC.
- British Geological Survey (BGS). (2019) 'World Mineral Production, 2013-2017', British Geological Survey, Nottingham.
- Brottem, L.V., Ba, L. (2019) 'Gendered livelihoods and land tenure: The case of artisanal gold miners in Mali', *West Africa Geoforum*, 105, pp. 54-62.
- Buss, D., Rutherford, B., Stewart, J., Côté, G.E., Sebina-Zziwa, A., Kibombo, R., Hinton, J. and Lebert, J. (2019) 'Gender and artisanal and small-scale mining: implications for formalization', *Extractive Industries and Society*, 6 (4), pp. 1101-1112.
- Cammaer, R. (2016) 'Tracing sustainable agriculture in Mozambique: From policy to practice', International Institute for Environment and Development, London.
- Chichava, S., Duran, J., Cabral, L., Shankland, A., Buckley, L., Lixia, T., Yue, Z. (2013) Brazil and China in Mozambican Agriculture: Emerging Insights from the Field. *IDS Bulletin* 44(4), pp. 101-115.
- Childs, J. (2014) 'From 'criminals of the earth' to 'stewards of the environment': The social and environmental justice of Fair Trade gold' *Geoforum*, 57, pp. 129-137.
- Cunguara, B., Hanlon, J. (2010) *Poverty Is Not Being Reduced in Mozambique*. Working Paper no. 74, Crisis States Working Papers Series No. 2, London School of Economics.
- Davidson, J. (1993) 'The transformation and successful development of small-scale mining enterprises in developing countries', *Natural Resources Forum* 17(4):315–326.
- Deloitte. (2018) 'Final Report Independent Administrator of EITI in Mozambique', Deloitte, London.
- Dondeyne, S., Ndunguru, E. (2014). 'Artisanal gold mining and rural development policies in Mozambique: Perspectives for the future'. *Futures*, 62: 120-127.
- Dondeyne, S., Ndunguru, E., Rafael, P., Bannerman, J. (2009) 'Artisanal mining in central Mozambique: Policy and environmental issues of concern'. *Resources Policy* 34(1-2): 45-50.
- Dreschler, B. (2001) 'Small-scale Mining and Sustainable Development within the SADC Region Mining', Minerals and Sustainable Development Project, London.
- Foley, C. (2007) 'Mozambique: A Case Study in the Role of the Affected State in Humanitarian Action', Overseas Development Institute, London.
- Government of Mozambique. (2017) *The Good Practices Handbook for Artisanal and Small Scale Mining in Mozambique*. Government of Mozambique, Maputo.
- Hanlon, J. (2010) 'Mozambique: 'the war ended 17 years ago, but we are still poor'', *Conflict, Security & Development* 10(1), pp. 77-102.
- Hentschel, T., Hruschka, F., Priester, M. (2002) 'Global Report on Artisanal and Small-Scale Mining, Minerals Mining and Sustainable Development (MMSD) Project', International Institute for

Environmental Development, London.

- Hilson, G., Hilson, A., Adu-Darko, E. (2014) 'Chinese Participation in Ghana's Informal Gold Mining Economy: Drivers, Implications and Clarifications', *Journal of Rural Studies* 34: 292-302.
- Hilson, G., Hilson, A. and Maconachie, R. (2018) 'Opportunity or necessity? Conceptualizing entrepreneurship at African small-scale mines', *Technological Forecasting and Social Change*, 131, pp. 286-302.
- Hilson, G. (2016) 'Farming, small-scale mining and rural livelihoods in Sub-Saharan Africa: A critical overview' *Extractive Industries and Society*, 3 (2), pp. 547-563.
- Hilson, G. (2019) 'Why is there a large-scale mining 'bias' in sub-Saharan Africa?', *Land Use Policy* 81: 852-861.
- Hilson, G. (2020a) 'Formalization bubbles': A blueprint for sustainable artisanal and small-scale mining (ASM) in sub-Saharan Africa. *The Extractive Industries and society* 7(4), pp. 1624-1638.
- Hilson, G. (2020a)
- Hilson, G. (2020b) 'The 'Zambia Model': A blueprint for formalizing artisanal and small-scale mining in sub-Saharan Africa?', *The Extractive Industries and Society* 7(4), pp. 1624-1638.
- Hollaway, J. (1991) 'Role of small-scale mining in Africa: building the informal sector, in *Alluvial Mining*, Institution of Mining and Metallurgy', Elsevier Science, London.
- International Labour Organisation (ILO). (1999) 'Social and labour issues in small-scale mines. Report for discussion at the Tripartite Meeting on Social and Labour Issues in Small-scale Mines', International Labour Organization, Sectoral Activities Program, International Labour Office, Geneva.
- Jennings, N.S. (2003) 'Addressing labour and social issues in small-scale mining, in *The Socio-Economic Impacts of Artisanal and Small-Scale Mining in Developing Countries*', (ed. G.M. Hilson). A.A. Balkema, The Netherlands, p. 151-160.
- Kamlongera, P.J. (2011) 'Making the poor 'poorer' or alleviating poverty? Artisanal mining livelihoods in rural Malawi ', *Journal of International Development* 23(8): 1128-1139.
- Kazilimani, E., Bukali da Graca, F. and McMohan, G. (2003) 'Artisanal mining baseline survey of Mozambique in the Socioeconomic and Environmental Impacts of Artisanal and Small-Scale Mining in Developing Countries' (ed. G.M. Hilson), A.A. Balkema, Rotterdam. pp. 218-243
- Kyle, S. (1991) 'Economic reform and armed conflict in Mozambique', *World Development*, 19 (6), pp. 637-649.
- Maclin, B.J., Kelly, J.T.D., Perks, R., Vinck, P., Pham, P. (2017) 'Moving to the mines: Motivations of men and women for migration to artisanal and small-scale mining sites in Eastern Democratic Republic of the Congo' *Resources Policy*, 51, pp. 115-122.
- Maconachie, R., Binns, T. (2007) 'Farming miners' or 'mining farmers'? Diamond mining and rural development in post-conflict Sierra Leone', *Journal of Rural Studies* 23(3): 367-380.
- Marshall, J. (1990) 'Structural Adjustment and Social Policy in Mozambique', *Review of African Political Economy*, 47, pp. 28-43.
- Mawowa, S. (2013) 'The Political Economy of Artisanal and Small-Scale Gold Mining in Central Zimbabwe', *Journal of Southern African Studies* 39(4): 921-936.
- McMahon, G. (2011) 'The World Bank's evolutionary approach to mining sector reform', *The World*

Bank, Washington DC.

- Mkodzongi, G., Spiegel, S. (2019) 'Artisanal Gold Mining and Farming: Livelihood Linkages and Labour Dynamics after Land Reforms in Zimbabwe' *Journal of Development Studies*, 55 (10), pp. 2145-2161.
- Mondlane, S., Shoko. D.M.S. (2003) 'The socio-economic and environmental impacts of artisanal and small-scale mining in Mozambique', pp. 265-280, in *The Socioeconomic and Environmental Impacts of Artisanal and Small-Scale Mining in Developing Countries* (ed. G.M. Hilson), A.A. Balkema, Rotterdam.
- Mpofu, B. (2000) 'Assessment of Seed Requirements in Southern African Countries Ravaged by Floods And Drought 1999/2000 Season', Report prepared for GIZ, Berlin.
- Mucavele, F.G. (2013) 'True contribution of agriculture to economic growth and poverty reduction: Malawi, Mozambique and Zambia synthesis report', Food, Agriculture and Natural Resource Policy Analysis Network (FANRPAN), Pretoria.
- Mutagwaba, W., Tindyebwa, J.B., Makanta, V., Kaballega, D., Maeda, G. (2018) 'Artisanal and small-scale mining in Tanzania – Evidence to inform an 'action dialogue'', International Institute for Environment and Development, London.
- Mutemeri, N., Walker, J.Z., Coulson, N. and Watson, I. (2016) 'Capacity building for self-regulation of the Artisanal and Small-Scale Mining (ASM) sector: A policy paradigm shift aligned with development outcomes and a pro-poor approach', *Extractive Industries and Society*, 3 (3), pp. 653-658.
- Oraham, I.T., Richards, J.P., Summers, R., Garvin, T., McGee, T. (2016) 'Artisanal and small-scale mining in Nigeria: Experiences from Niger, Nasarawa and Plateau states', *The Extractive Industries and Society* 2(4): 694-703.
- Patel, K., Rogan, J., Cuba, N., Bebbington, A. (2016) 'Evaluating conflict surrounding mineral extraction in Ghana: Assessing the spatial interactions of large and small-scale mining', *The Extractive Industries and Society* 3(2): 450-463.
- Persaud, A.W., Telmer, K.H., Costa, M., Moore, M.L. (2017) 'Artisanal and Small-Scale Gold Mining in Senegal: Livelihoods, Customary Authority, and Formalization', *Society and Natural Resources* 30(8): 980-993.
- Republic of Mozambique (2001) *Action Plan for the Reduction of Absolute Poverty (2001-2005) (PARPA)*, Republic of Mozambique, Maputo.
- Salimo, P., Buur, L., Macuane, J.J. (2020) The politics of domestic gas: The Sasol natural gas deals in Mozambique. *The Extractive Industries and Society*, 7(4), pp. 1219-1229.
- Sauerwein, T. (2020) 'Gold mining and development in Côte d'Ivoire: Trajectories, opportunities and oversights', *Land Use Policy*, 91, art. no. 104323.
- Seccatore, J., Veiga, M., Origliasso, C., Marin, T., De Tomi, G. (2014) 'An estimation of the artisanal small-scale production of gold in the world', *Science of the Total Environment*, 496, pp. 662-667.
- Siwale, A., Siwale, T. (2017) 'Has the promise of formalizing artisanal and small-scale mining (ASM) failed? The case of Zambia'. *The Extractive Industries and Society* 4(1), pp. 191-201.
- Spiegel, S.J. (2015) 'Shifting Formalization Policies and Recentralizing Power: The Case of Zimbabwe's Artisanal Gold Mining Sector', *Society and Natural Resources*, 28 (5), pp. 543-558.

- Tychsen, J., Mukofu, C., Msimuko, J.,imba, K., Chadukwa, C., Chibonga, M., Phiri, C., Simukali, M., Nguni, M., Mwenya, C., Chinyamuka, L., Sanga, C., Chuula, T., and Milimo, I. (2018) 'ASM Handbook for Zambia', Geological Survey of Denmark and Greenland (GEUS), Copenhagen.
- United Nations Conference on Trade and Development (UNCTAD). (2019) 'State of Commodity Dependence 2019', United Nations Conference on Trade and Development (UNCTAD), New York.
- United Nations Development Program (UNDP). (2019). 'Human Development Report 2019', United Nations Development Program (UNDP), New York.
- United Nations Economic Commission for Africa (UNECA). (2011) 'Minerals and Africa's Development: The International Study Group Report on Africa's Mineral Regimes', United Nations Economic Commission for Africa and African Union, Addis Ababa, Ethiopia.
- United Nations Economic Commission for Africa (UNECA). (2016) 'Mozambique Country Profile 2016', United Nations Economic Commission for Africa, Addis Ababa.
- United Nations Environment Program (UNEP). (2012) 'Analysis of Formalization Approaches in the Artisanal and Small-Scale Gold Mining Sector Based on Experience in Ecuador, Mongolia, Peru, Tanzania, and Uganda', United Nations Environment Program, Nairobi.
- Van Bockstael, S. (2014) 'The persistence of informality: Perspectives on the future of artisanal mining in Liberia', *Futures* 62: 10-20.
- Wiegink, N. (2015) 'It Will Be Our Time To Eat': Former Renamo Combatants and Big-Man Dynamics in Central Mozambique', *Journal of Southern African Studies* 41(4), pp. 869-885.
- World Bank. (1992) 'A Strategy for African Mining', The World Bank, Washington DC.
- World Bank. (2007) 'Mozambique Mineral Resources Management Capacity Building Project: Implementation Completion and Results Report', The World Bank, Washington DC.
- World Bank. (2017) 'Mining and Gas Technical Assistance Project', The World Bank, Washington DC.