

HOW CAN THINGS BE DIFFERENT IN SOUTH AFRICA'S MINING INDUSTRY?

**IF WELLBEING IS THE MAIN GOAL OF THE ECONOMY OF THE FUTURE,
HOW DOES MINING FIT IN?**

**HOW CAN WE SHIFT AWAY FROM THE LOW-SKILLED,
LABOUR-INTENSIVE MODEL?**

**HOW CAN MINING-AFFECTED COMMUNITIES, AND THE NATION,
BENEFIT EQUITABLY FROM THE COUNTRY'S MINERAL ENDOWMENTS?**

**WHAT ARE THE LINKS BETWEEN MINERAL EXTRACTION
AND INDUSTRIALISATION?**

HOW CAN WE USE TECHNOLOGY TO DIG DEEPER AND LESS DANGEROUSLY?

**WHAT ARE THE IDEAL ROLES OF THE STATE, PRIVATE CORPORATIONS
AND UNIONS IN A 21ST-CENTURY MINING INDUSTRY?**

**HOW DO STRUCTURES OF MINING IN THE PAST TAINT THE POSSIBILITIES
OF MINING IN THE FUTURE? IS THERE A FUTURE IN MINING?**

The future of mining in South Africa is hotly contested. Wide-ranging views from multiple quarters rarely seem to intersect, placing emphasis on different questions like these, without engaging in holistic debate.

The first of its kind in South Africa, this book aims to catalyse change by gathering together fragmented views into unifying conversations. It highlights the importance of debating the future of mining in South Africa and for reaching consensus in other countries across the mineral-dependent globe.

It covers issues like the potential of platinum to spur industrialisation, land and dispossession in the platinum belt, the roles of the state and capital in mineral development, mining in the era of the Fourth Industrial Revolution, the experiences of women in and affected by mining since the late 19th century, and mineworker organising: history and lessons and how post-mine rehabilitation can be tackled.

It was inspired not only by an appreciation of our country's extensive mineral endowments, but also by a realisation that, while the South African mining industry performs relatively well on many technical indicators, its management of broader social issues leaves much to be desired. It needs to be deliberated whether the mining industry can play as critical a role going forward as it did in the evolution of our economy.

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MAPUNGUBWE

INSTITUTE FOR STRATEGIC REFLECTION

A MISTRA Publication

THE FUTURE OF MINING IN SOUTH AFRICA **SUNSET OR SUNRISE?**



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Preface

HOW CAN THINGS BE DIFFERENT in South Africa's mining industry? How can a shift away from the low-skilled, labour-intensive model change the work and workings of the industry? How can mining-affected communities, and the nation more broadly, benefit equitably from the country's mineral endowments? What are the links between mineral extraction and industrialisation? What are the ideal roles of the state, private corporations and unions in a 21st century mining industry?

This research project was born of these big questions. It was inspired not only by an appreciation of South Africa's extensive mineral endowments; but also by a realisation that, while the South African mining industry performs relatively well on many technical indicators, its management of the broader social issues leaves much to be desired. Critically, the principle needs to be debated whether, going forward, the mining industry can play as critical a role as it did in the evolution of the South African economy.

Collectively, the authors pursue these questions with a transdisciplinary lens, in line with the defining principles of the

research endeavours of the Mapungubwe Institute for Strategic Reflection (MISTRA). Questions about the interplay of mining with the environment and climate change come into the mix. So do issues around the experiences of women – arguably the ‘lesser gender’ in the mining industry more than in any other major industry.

At the same time, the way in which the historical roots of dispossession take shape in mining industry dynamics today are examined, whether in the desperation and ‘illegality’ of informal mining or the trials and tribulations of mining-affected communities. Beyond this is the critical challenge brought out sharply in the sprawling mining dumps across the face of South Africa: what happens after mines are long gone?

This volume brings together political economists, sociologists, policy experts, environmental experts, community activists, historians and labour activists. The process of producing the volume was highly collaborative. The authors first gathered to conceptualise the chapters collectively and then assembled to hear one another’s findings and to refine these, both collectively and individually. The editor played the role of interlocuter, prodding the contributors to consider relevant insights from other contributors in the multiple rounds of chapter drafting.

In the course of these interactions, new issues came to the fore. For instance, while the history of South African mining is treated against the backdrop of gold mining, the decline of the latter has coincided with the emergence of platinum group metals (PGMs), of which South Africa is estimated to have some three-quarters of world reserves. Currently, though, this sub-sector is facing serious headwinds of low prices, high costs, community unrest and uncertain trajectories of global demand. However, viewed against the emergent hydrogen economy and growing demand for jewellery, PGM mining does seem to have a long-term future barely appreciated.

More often than not, workers in the mining industry, as in most other economic sectors, are treated as an appendage, a cost to be managed down. In appreciation of their central role, the issue of their involvement at all levels of the industry – from the bowels of the earth to the skyscrapers where the product of their labour is apportioned –

has to form a critical part of the examination of the political economy of South African mining. All matters to do with raising the mining sector onto a higher trajectory have to place workers at the centre, including skills development, the opportunities that should come with the development of a mature mining cluster and the organisational adaptations required of a labour union of the 21st century.

As this book goes to press, the debate on the Mining Charter, meant to improve the sector’s inclusivity, has reached a crescendo. This is understandable, given the weaknesses identified in several chapters in this volume. At the same time, the spate of accidents in South African mines has intensified; there is concern that, after a steady decline in the past 10 years, worker fatalities may be trending upwards.

It is the hope of the authors that the issues raised in this volume will encourage broader discussion on the role of mining in a South Africa that is striving to improve its growth and development. Nay more, if the ideas contained in this volume were to serve as catalyst for action, MISTRA would have more than achieved its ambition.

MISTRA wishes to express its profound appreciation to the team that put this volume together, from the authors to the peer reviewers, editors and project coordinators. Our gratitude is also extended to the Department of Science and Technology, Anglo American and AngloGold Ashanti who funded this project, as well as the many other contributors to MISTRA’s operations and sustainability.

– Professor Sibusiso Vil-Nkomo
Chairperson: MISTRA Board of Governors

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Formalising artisanal and small-scale mining *Problems, contradictions and possibilities*

HIBIST KASSA

ARTISANAL AND SMALL-SCALE MINING (ASM) has increasingly become globally recognised as an important livelihood strategy. Particularly within the contexts of increased impoverishment of rural populations, the search for alternative livelihood strategies and volatile commodity prices, ASM is in some instances displacing traditional sectors such as agriculture (Awumbila and Tsikata, 2010; Hilson and Gatsinzi, 2014).

In the 1980s and 1990s, a wave of formalisation in the Global South sought to more effectively integrate ASM into national economies. This occurred within the frame of structural adjustment, expanded large-scale mining (LSM) due to favourable conditions such as tax breaks and attempts to eliminate so-called criminal ASM activities. Either specific legislation on ASM was passed, as in Ghana in 1989,

or general mining laws were reformed as in the Democratic Republic of Congo (DRC) (Bugnosen, 2005: 6).

Intensified interest in the informal economy, as a route to poverty alleviation, led to a wave of legislative measures, aimed at regulating ASM, in the 1980s and 1990s as a first step to formalisation.¹ These interventions, aimed at formalising ASM, were presumed to mark the end of criminalisation. However, the case in Ghana shows how these measures have instead created new challenges, with ASM remaining largely criminalised, and the deployment of the military to implement a moratorium on the sector. It is this understanding that has informed the call for decriminalisation in South Africa.

Regulation has tended to sharpen and entrench mechanisms of exclusion, mainly by impeding access to more profitable concessions, which in turn leads to persistent informality and criminalisation. Policy interventions also tend to undermine the transformation of ASM operations into safer, more sophisticated or specialised ventures.

In South Africa, abandoned and active mines have become sites of contestation over natural resources. Mine tailings in Ekurhuleni Municipality, for instance, have been at the centre of reprocessing, with artisanal miners operating in the shadow of a mining corporation encroaching on this work.² The 2018 allocation of licences to artisanal miners, known as *zamazama*,³ in Kimberley, is an example of how to integrate these operations. More generally, ASM in precious and semi-precious minerals tends to be undertaken clandestinely or associated with illegality. The existing legal framework in South Africa has not explicitly defined ASM as illegal. Instead, it is at best ‘non-legal’.

It is proposed here that it is critical to reflect on international experiences of regulation while taking cognisance of the specificities of the South African case. Ghana presents a compelling case of relevance

1 Formalisation of ASM ‘involves property rights resolution and enforcement, land-use planning, fiscal regulation, and, more broadly, the implementation of environmental and social norms’ (Salo et al., 2016: 1058).

2 In Vlakfontein, *zamazama* started reprocessing in 1994 and in this period several companies entered the mine tailing.

3 *Zamazama* means ‘to take a chance’ in *isiZulu* and is now commonly used to refer to artisanal miners operating in abandoned and active mining concessions.

to South Africa. This chapter therefore begins by investigating the challenges of defining ASM. It then traces the historical processes of dispossession, dislocation of indigenous mining and the emergence of large-scale mining in South Africa. The final section explores policy gaps and the politics of policy interventions.

DEFINING ARTISANAL AND SMALL-SCALE MINING

The problem of defining ASM has plagued researchers, policy-makers and civil society for over three decades (Hentschel et al., 2002). The use of concepts such as ‘pre-capitalist production’, ‘peasant mining’, ‘indigenous mining’ and ‘African diggers’ points to the different ways in which this form of mining is understood (Lanning and Mueller, 1979; Graulau, 2006). In part, these terms also reflect how mining, responding to the impulses of local economies, had its own character and orientation prior to the colonial encounter.

It has also been suggested that categories can be developed with reference to the scale of ASM and the degree (if any) of mechanisation: the number of workers, the techniques deployed and the level of capitalisation (Noestaller, 1987). Hentschel et al. (2002) suggest that these do not need to be present in all cases but can be combined to take account of the country context. However, Noestaller (1987) explains that even the number of people working at a site cannot be used to draw conclusions about the actual scale of an operation. The capital intensity and the nature of deposits can shape a mine operation and distort an understanding of its scale.

Mutemeri and Petersen (2002), referring to the South African Small Business Act (1996) argue that the Act’s categories of micro, very small, small and medium businesses are not helpful when it comes to mining. Also, ASM is not easily categorised as being either formal or informal, legal or illegal. Even in contexts where regulation has been attempted, as in Ghana, ASM is still primarily criminalised.

The South African Chamber of Mines (renamed in 2018 the Minerals Council of South Africa) has sought to make a distinction between ‘criminal networks’ operating in ASM and those operations that are based in communities, understood as informal mining (SAHRC,

2015). In South Africa, as elsewhere on the continent, ASM does not only include precious and semi-precious minerals and metals but also non-precious minerals such as clay and kaolin. The latter, however, do not generate as much interest in controlling ASM operations, due to the low level of returns (Graham, 2017).

Debrah et al. (2014), similar to Ledwaba and Mutemeri (2017: 3), in a comparative study of South Africa and Ghana, add that there is ‘a lack of context and an understanding of the continuum’ of ASM, including the role of junior miners. They therefore distinguish between artisanal mining, on one hand, and small-scale mining, on the other. The former ‘refers to unorganised mining activity that does not make use of sophisticated machinery, whereas ‘small-scale’ is used in the context of organised miners that may not necessarily use sophisticated machinery but have a higher revenue turnover’ (Debrah et al., 2014: 914). They therefore propose looking at each of the two forms individually.

The presumption by Debrah et al. (2013) that artisanal miners are ‘unorganised’ needs to be questioned. The lack of sophisticated machinery or technology in an operation does not preclude some form of organisation. This may not be a formal structure, such as a committee, co-operative or an association, but there are forms of co-operation that guide the way in which work is organised in informal mining operations.

In the case of artisanal miners in gold production, an agreement on where and how to process the ore or reprocess the waste from mine dumps is required. A basic principle of mutual respect and recognition of the right to work an area is needed to ensure a group can operate in an area, even if each individual operates autonomously. The interaction with middle men, where the precious minerals are sold, also needs to be negotiated and agreed upon by the teams collaborating in an operation, as found in Khutsong and Vlakfontein. These forms of co-operation can lay the basis for structures to emerge.

The question of safety and risk underground also depends on sharing information based on experience built up by artisanal miners. All this takes a degree of collaboration and agreement. These practices and principles, which enable some form of self-regulation of work and inter-personal relations in ASM operations, however fragmented

they may appear, hold potential for autonomous self-organisation by artisanal miners. Depending on the context, this can be in some form of interaction with communities affected by mining or other civil society groups. Nyoni (2017: 147) makes a similar case in relation to artisanal miners in Roodepoort, where he shows how the zamazama self-regulate access to mine shafts as part of a broader ‘morally defined ... code of conduct’.

According to the South African Human Rights Commission (SAHRC), the mining regime in South Africa appears to cater for small-scale miners but not artisanal miners (SAHRC, 2015). The Commission underlines the need to understand the differences amongst artisanal miners. Within operations, those sponsors and supervisors in charge of more profitable operations – usually men – are more likely to access capital, technology, information on deposits and capacity building services. This has a bearing on who can obtain licences. The SAHRC concludes that a lack of definition has in fact undermined interventions and more precise classifications are needed.

Geenen (2013: 2) attributes this challenge of crafting appropriate policy for ASM in the DRC mainly to legal and policy limitations resulting from neoliberal reforms that led to large tracts of land being offered by the state to LSM operations at the expense of ASM producers. In these conditions, the latter are unable to compete for concessions of value. Also, in conditions of increased competition, LSM operations are unwilling to let go of even marginally profitable concessions.

Dichotomising the formal and informal sectors undermines an understanding of the linkages between ASM and LSM. The contributions of ASM to the formal economy can be significant. In Ghana, diamond production is carried out solely through ASM.⁴ ASM also contributed 31 per cent to national gold production in Ghana in 2016 – an increase from 2.2 per cent in 1989 (Government of Ghana, 2017).

4 Ghana Chamber of Mines reports a decline of production of diamonds from 185,376 carats in 2015 to 141,005 carats in 2016 mainly due to a shortfall in production from small-scale miners. No explanation is provided for the shortfall. Available at <https://ghanachamberofmines.org/wp-content/uploads/2016/11/Performance-of-the-Mining-Industry-in-2016.pdf>

All these complexities have left research on ASM in a rather ambiguous state, without a clear definition of the sector. However, given the complexities, perhaps arriving at a firm definition is not actually helpful. It may instead be more appropriate to arrive at context-specific descriptions, situated within the history of mining and the production and reproduction processes shaping operations. This would entail unpacking the configuration of relations between the state, transnational mining companies and ASM operations. Also required is an understanding of the structure of operations, the level of technology, the type of commodity and the nature of ore deposits. Other categories of inquiry should include the type of mineral, methods of production, nature of linkages with the local economy and the social spaces within which the operations take place. More broadly, such an approach would bring into view the social, political and economic factors relevant to formulating policy interventions and anticipating likely outcomes.

A key determinant of the variations in ASM is the commodity being mined. Precious and semi-precious minerals such as gold, coltan, diamonds and other gemstones tend to attract greater attention from regulators (Graham, 2017). This can entail regulations not only on concessions but also inputs. In the case of gold, this requires regulations on possession of mercury, a key and toxic element used in amalgamation (Munakamwe, 2017). Similar attention is not directed to regulating non-precious minerals like kaolinite clay, or salt mining.

The methods deployed can cover rudimentary and low-cost tools and techniques or more mechanised and capital-intensive operations. This gradual shift towards more capital intensive and mechanised operations has been ongoing as the ASM sector develops, as in the case of Ghana. Therefore, the scale of the operations can be related to the degree of capitalisation and mechanisation, which can either lead to an expansion in the amount of labour required or more specialised skills. Similarly, in South Africa, more sophisticated processing methods are gradually being integrated in gold ASM operations for tasks like crushing rock ore. This evolving sector therefore requires regulations that seek to provide the extension services required for operations especially given the high risks borne by ASM miners, both male and female.

It is also important to understand what ASM, in all its variations,

means in contexts where LSM has historically dominated the market. The state tends to be heavily skewed towards supporting, enabling and facilitating LSM operations. Given this, the focus of state regulation in South Africa tends to centre on where, how and what is mined. The focus on precious minerals, in particular, dominates the emerging discourse on ASM and contestations around regulation and criminalisation. It is to the South African case that this chapter now turns.

DISPOSSESSION, DISLOCATION OF INDIGENOUS MINING AND THE RISE OF LARGE-SCALE MINING IN SOUTH AFRICA

South Africa is a case of extreme dispossession and attempts at undermining African petty commodity production (Lanning and Mueller, 1979). In the pre-colonial period, mining was supplementary to subsistence farming and tended to be a store of wealth, while also indicating status and providing spiritual and cultural value. Iron, copper and salt were the key commodities traded at the time. The quality of iron produced was of such a standard that the heavy concentration of carbon led some to categorise it as steel. Well into the 19th century iron wrought in Africa was considered to be of a higher quality than that produced in Europe, with the latter considered by Africans as being 'rotten' (Lanning and Mueller, 1979: 27–28). This gives a strong indication of the forms of indigenous production which were displaced with the entry of mining firms, aided by financiers of the metropolises and the colonial state (Lanning and Mueller, 1979).

Charles Feinstein (2005: 51, 55–59) outlines how dispossession itself was insufficient to free up labour for exploitation in the mines. This dispossession had to also uproot people from the soil. So long as Africans could secure their livelihoods through agriculture, there was a need for more aggressive measures to ensure labour was available. This included the use of slave labour, taxation and restrictions on movement.

African resistance remained resilient even after the establishment of the Cape Colony and the emergence of the Transvaal as a separate Afrikaner colony. African petty commodity producers sought to

protect their land and cattle from appropriation. African agency to resist the dispossession and purchase of land spurred legislative interventions to restrain Africans. Beinart and Delius (2015) provide a useful exploration of the 1913 Natives' Land Act and the contestation that preceded it.

Lanning and Mueller (1979) trace how the discovery of diamonds was a crucial turning point. The discovery catalysed a convergence of interests in eliminating African indigenous production. As Lanning and Mueller put it, 'fifty years after the discovery of diamonds at Kimberley ... through a combination of force and trickery, the mining companies had broken down the earlier resistance of African rulers to the foreign exploitation of African minerals' (Lanning and Mueller, 1979: 52). In gold mines, when the surface workings were exhausted, simple methods of mining were no longer adequate to penetrate depths below 40 metres. By 1892, the introduction of the potassium cyanide-based extraction – developed by MacArthur and Forrest in Scotland – improved extraction techniques. This required 2,009 litres of water to process a tonne of ore, for which dams were constructed. The shift to mining deeper underground was also dependent on advances in technology, finance, a stable work force and expertise. These circumstances made it necessary for agglomerations to occur leading to the emergence of the group system (Bonner and Nieftagodien, 2012: 6–8).

Financiers with links to the metropolises emerged, and a process of merging claims began. Nonetheless, there was a concerted attempt to ensure small claims as units of production were protected. No more than three claims per digger were allowed. Taxes were raised to support the new colony of Griqualand West, while there was also an attempt to regulate claims to secure the protection of small diggers from proprietors. For instance, in Kimberley, more than half of the workforce were African diggers. The diamond mines of Kimberley alone had 3,600 claims (Lanning and Mueller, 1979: 33–34).

Further undermining artisanal mining, the British colonial government considered the small diggers to be an obstacle for raising taxes and creating a stable environment for future investments. Mismanagement of the colonial administration of Griqualand West,

in addition to other factors, fuelled a financial crisis which worsened and put at risk protections for small diggers. These diggers organised under the Kimberley Defence League and became an armed threat to the Griqualand West colony (Lanning and Mueller, 1979: 33–39).

These desperate conditions were manipulated by the large claim owners, financiers and company representatives, who swiftly escalated the situation and ensured the Griqualand West colony capitulated to British control by 1871. The transformation of the diamond industry was consolidated by barring Africans from becoming skilled workers, holding claims or even from 'washing debris' (Lanning and Mueller, 1979: 38–39). The same authors note that a pass system was also introduced and was later entrenched with the construction of the mine compounds. Hence the structure was built for the South African mining industry as we know it.

Wolpe (1972) contends that the creation of reserves laid the basis for entrenching a system of cheap wage labour to meet needs of white mining capital, in which women were key to reproduction. This is contested by Lipton (2007: 43), who points to how the reserves served the interests of plantation farmers while mining companies shifted more to migrant labour from beyond the borders of South Africa. This dependence on migrant labour continues to be reflected in the contemporary operations of LSM in South Africa, but also ASM.

In addition to private interests, there was a concerted effort by the state from 1935 and into the 1970s to restrain black small-scale enterprises (informal or backyard production) in the reserves with discriminatory measures. Favouring large-scale enterprises, the state sought to counter the development of a black industrial class. Each reserve had its own development corporation which set up industrial parks for black-owned small-scale enterprises in the reserves, but these still faced bureaucratic obstacles and did not receive similar backing to large enterprises. The combination of the undermining of vocational training institutions and production through lack of incentives and other restrictions, meant that African industries were not able to compete with European trades in urban areas (Da Silva, 1987: 39–44, 47–48, 171). These shifts provide some explanation for the ways in which segregation, later entrenched under apartheid by the National

Party, undermined African petty commodity production. They also show how ASM was very quickly crushed by large-scale financiers and mining firms, with the support of the state, as part of a broader push to dispossess Africans and create a cheap wage labour system. It also emerges that the nature of the geological deposits of gold and diamonds required capital-intensive operations and underground mine shafts. Even at their nascent stage, LSM operations took a form that ensured that ASM operations, where they occurred, remained largely marginal.

This history of exclusion at the centre of dispossession and accumulation in South Africa has positioned ASM in the contemporary period as representing, even if in symbolic terms, an indigenous alternative to LSM or the accumulation of capital in the hands of the dispossessed. It is against this backdrop that the importance of integrating and enabling the growth of ASM is affirmed. Ledwaba (2017: 34) and Mutemeri and Petersen (2002: 288–289) highlight how policy shifts after 1994 marked an attempt to support historically disadvantaged South Africans in the mining sector which included ASM. The obstacles to ASM operations were identified. These centred on access to markets, finance, deposits and mineral and land rights.

The challenges are technical in the first instance, but only at a superficial level. ASM raises political and economic questions about the nature of the state's relation to LSM and how this relationship has shaped the legal framework which continues to largely exclude or criminalise ASM operations. The nature of integration in the domestic market has also facilitated profit-making based on precarious labour in mining in an extreme way. Gold is sold directly to buyers who are based in the neighbouring areas, who in turn resell in Johannesburg. For instance, a gram of gold sold in Langaville for R420 can be resold in Johannesburg for R460 or R500. Munakamwe (2017: 171–172) traces the trade networks which feed into the formal market. At the top end of the chain, gold is resold for R1,100 and R1,200. This disparity points to the need for an open market to enable zamazama miners to gain fairer prices.

The challenges ASM miners face in overcoming the obstacles to legalising their operations are consistent throughout the Global South. This is the case in countries like Ghana where regulations, seeking

explicitly to integrate ASM into the formal economy, have instead led to intensified criminalisation. To grapple with this, it is necessary to consider the underlying logics and politics of policy interventions, which the next section explores.

POLICY GAPS IN ARTISANAL AND SMALL-SCALE MINING: LESSONS FROM GHANA

Initially, ASM was left out of poverty alleviation programmes and strategies since it was regarded as being too marginal and risky by international development agencies and governments, irrespective of the role it played in the mining sector and rural economies of the Global South (Davidson, 1993: 315; McQuilken and Hilson, 2016). In the 1980s it had been assumed that artisanal mining was a product of individual choice, adventurism and enterprise units (Noetstaller, 1987). The hardship imposed under structural adjustment in the 1980s is often cited as unleashing greater economic instability in rural economies and households, creating even greater need for alternative livelihood strategies (Hilson, 2001: 2–3; Bugnosen, 2005: 15). Artisanal mining came to fit into this and expanded rapidly in the 2000s mining commodity boom. In the 1980s, the World Bank initially adopted a position of treating artisanal mining in the same policy framework as LSM. Altogether, these measures have been found to be largely inappropriate and too rigid to meet the needs and the interests of artisanal miners (Davidson, 1993: 315–317).

ASM is now understood as being largely driven by unemployment and poverty (Davidson, 1993; Hilson and Gatsinzi, 2014; Geenen, 2013; McQuilken and Hilson, 2016). In countries like Ghana, smallholder farmers are shifting to ASM because agriculture has been suffering a decline since the 1980s. In addition, throughout the South, retrenchments from LSM operations and from the public sector and wider conditions of deindustrialisation have contributed to a livelihood crisis (Awumbila and Tsikata, 2010; Hilson and Gatsinzi, 2014). Institutions like the World Bank and the International Labour Organisation thus came to recognise ASM as an alternative livelihood strategy, though as mentioned, policy gaps remain in both national and

international arenas (McQuilken and Hilson, 2016).

Barchiesi (2010: 72–75) explains that in most African economies, the informal sector grew rapidly as a ‘response to adjustment’. Informal sector activity in South Africa today reflects the expansion of precarious work and jobs, which resulted from government measures to create a ‘business-friendly environment’ after 1994. Casualisation, which undermines the conditions of permanent workers, has positioned the informal sector as an alternative to permanent jobs. Formal sector workers have been pushed to explore possibilities outside of wage work, especially through the setting up of small enterprises. Some hold second jobs in individual enterprises as self-employed workers. The conditions of precarity, and their inability to provide for household needs, have also encouraged women to seek work beyond unpaid care work.

Throughout South Africa, the reprocessing of mine tailings is an instance of work in the informal sector. Largely clandestine ASM operations have emerged. In some cases, artisanal miners in mine tailings find themselves in competition with LSM operations keen to reprocess mine waste. In chapter 12 of this volume, Fioramonti rightly points to the reprocessing of mine tailings by artisanal miners as an important frontier for rethinking mining work.

A forum hosted by the Ekurhuleni Municipality in January 2003 reflects this thinking (Cezernowalow, 2003). In attendance were representatives from the Department of Mineral Resources, the Department of Water Affairs and Forestry, mining companies in the municipality, owners of private dumps and a committee of small-scale miners. The forum explored the potential for expanding and formalising artisanal and small-scale mining as part of a broader programme of linking national programmes to local needs. This was a space created for government and the mining industry to assess social plans, environmental impacts and the decline of LSM, in addition to support for clandestine artisanal and small-scale mining (Cezernowalow, 2003).

In the words of Karuna Mohan, Executive Director of Local Economic Development of the Ekurhuleni municipality, the aim was to transform criminalised activity into a livelihood option. In an optimistic reading of a then proposed mining law, the legislation was taken to provide for the possibility for mineral rights to be inclusive

of ‘historically disadvantaged people and women’ (Cezernowalow, 2003). There was also optimism about widening the tax base of the municipality. A co-ordinating company was proposed to support the development of small-scale mining and also manage broader resource management. Some of the activities proposed included ensuring access to finance, training, and monitoring; rehabilitation of areas destroyed by large-scale mining; supporting upstream and downstream linkages and providing technical support in the form of geological information (Cezernowalow, 2003).

Instead of this initiative being taken forward, DRDGOLD South Africa and Mintails Limited reopened the Ergo surface treatment plant in Brakpan, Ekurhuleni in 2007. DRDGOLD is a South African enterprise reprocessing mine tailings and underground mines in South Africa and Zimbabwe. Formerly known as Durban Roodepoort Deep Mining Company, it was established in 1895, hence it is clearly a large-scale mining operation with a significant history of accumulation. Given this, DRDGOLD was in a position to enter into a joint venture with Mintails Limited and purchase the Ergo plant from the previous owner, AngloGold Ashanti, thereby eliminating the possibilities for artisanal miners in the area. Apart from DRDGOLD, other mining companies are encroaching similarly. For instance, in Vlakkfontein (Kwa-Thema) mine tailings, zamazama miners report being displaced from preferred sites of work by Benoni Gold.

This displacement in Ekurhuleni ultimately brings out what Bugnosen (2005: 13) explains as persistent conflicting relations between LSM and ASM. These are prevalent when artisanal or small mine operations are set up in areas where large-scale miners hold prospecting or exploration rights, but do not make use of them. In Ghana, conflicts with LSM firms are not uncommon, with the state intervening with damaging consequences, not only for ASM operations, but also the local economy (Hilson et al., 2007).

In the early 2000s, the National Security Council of Ghana co-ordinated military intervention against ASM operations, in response to pressure from the Chamber of Mines. Soldiers were mandated to stop unlicensed ASM, operating on the concessions of LSM companies. This led to mass arrests, destruction of ASM equipment and eventually

a resettlement programme (Hilson et al., 2007).

The initial sweep of ASM operations began in Prestea (Western Region), moving to Obuasi (Ashanti Region) and finally to Ntronang (Eastern Region). The resettlement was to be implemented in Prestea, where ASM miners were operating on the concession of Golden Star Resources Limited. The artisanal miners were promised that they would be relocated and reorganised in co-operatives, with licences to mine specific sites. About 6,000 people were to be relocated to three areas in Japa (Western Region), Adjumadium (Western Region) and Winneba (Central Region). The project failed due to many factors including an inability to register Prestea based miners, a lack of detailed geological survey and the existence of ASM operations on the new sites (Hilson et al., 2007).

This failed relocation project was preceded by another attempt in 2003 at a negotiated sharing arrangement in Prestea between Golden Star Limited and ASM operators in Prestea, Himan and Bondai. The ASM operators were to be the sole operators within a site known as Number Four Bungalow. It was agreed that only 100 people and 100 pits would be worked on the site. Lastly, negotiations were to be key in any interventions, especially displacement. In practice, the agreement was not respected by Golden Star Resources Limited (Hilson et al., 2007).

These examples point to regulation and negotiation as strategies to displace or disrupt ASM operations in the interests of LSM operated by foreign investors. These strategies were also used in Obuasi, another mining town in Ghana, where the entire concession is under AngloGold Ashanti (AGA) and legal ASM is thus precluded.

In the early 2000s, a mass arrest of 117 people triggered the formation of an ASM committee in Obuasi. This happened at a time when ASM surface mining had been undermined in the process of a reclamation exercise undertaken by AngloGold Ashanti as required by the Environmental Protection Agency. The artisanal and small-scale miners therefore needed alternative areas in which to operate (Abubakar, interview, 24 November 2017).

Obuasi Municipality is mostly within the concession of AGA, and most ASM operations in Obuasi are therefore within the concession.

In such instances, the law gives the authority to determine where ASM can take place to the minister. Typically, however, areas which are mineral rich are not allocated as concessions for ASM operators (McQuilken and Hilson 2016: 27). This becomes an obstacle for artisanal and small miners attempting to operate within the legal framework. According to an ASM licence holder, Alhaji Ben Abdulai (Interview, 23 November 2017):

There is a difference between licence and concession so if you have a licence that alone does not mean you can enter someone's concession and start mining. We also have some people with a concession, but they don't have a licence to mine, therefore if you have a licence you need to also get your own concession before you can operate ...

There was a time I went for a parcel of land at Asante Akyem to mine, even though concession belonged to a mining company called Golf Cost; they had left it untouched for 25 years. The moment they heard of our presence on the land they also came out to work. So I have had to struggle with them, but I had the backing of the community because I had employed 850 people as my workforce while the so-called multinational company had only nine workers with only three locals so between me and such a company – who is helping build our nation?

In April 2017, Ghana's Minister of Lands and Natural Resources, John-Peter Amewu, announced a six-month moratorium. This was in response to pressure from the Chamber of Mines, supported by Accra-based media and a nationwide campaign against environmental damage resulting from alluvial ASM. The moratorium, which was extended indefinitely and was still in effect at the time of writing (August 2018), also affects ASM of rock ore deposits. In effect, the moratorium seeks to limit continued development of local capital in gold mining, if not eliminate it completely. This seems to be affirmed by the indefinite extension of the moratorium until 'illegal' ASM is eradicated (Ghana News Agency, 2018).

If not facing comprehensive barriers, as in these attempts of the

Ghanaian state acting for what it puts forward as environmental protection, ASM faces state policies that constrain growth considerably. In an overview of ASM-related legislation in the Global South, Bugnosen (2005) argues that existing legislation tends to limit the upgrading and transformation of small-scale mining. For instance, limits are placed on the depth of operations, sanctions are applied to the use of explosives and advanced technology is prohibited. Similarly, where artisanal and small-scale miners are given access to land, it is to plots that are not lucrative (Bugnosen, 2005).

In South Africa, Ledwaba (2017: 34) and Mutemeri and Petersen (2002: 288–289) highlight how policy shifts after 1994 marked an attempt to support the entry of historically disadvantaged South Africans. ASM was identified as one of the sectors to receive support. As in other countries, the obstacles centre on access to markets, finance, deposits and mineral and land rights. The Minerals and Petroleum Resources Development Act of 2002 initially enabled licences to be issued for operations not exceeding one and a half hectares. By 2011, about 1,030 small-scale miners were registered in South Africa (Mine and Health Safety Council, cited in Ledwaba, 2017: 35).

Section 2.8 of the 2017 Mining Charter makes provision for micro-scale players in mining. It categorises mining firms as operating on a micro-scale if the company has a turnover of less than R1 million. These actors are exempt from targets around mining community development, employment equity, ownership and procurement. The draft 2018 Mining Charter (released at the time of writing) emphasises the need to redress and counter historical injustice. All of this demonstrates attempts to accommodate small-scale players in mining (Ledwaba, 2017; Debrah et al., 2013; Mutemeri and Petersen, 2002). This is more likely opening space for emerging black capitalists attempting to position themselves in the mining sector.

However, in practice, this does not create a supportive policy space for smaller-scale producers – ranging from petty commodity producers (primarily based on self-exploitation or family labour) to other small operations employing wage labour. Moreover, ASM operations in South Africa are operated by both South African workers and documented and undocumented migrants. The narrative of these migrants is one of

exclusion from better-paying work, especially in the formal sector. In interviews conducted in Vlakkfontein (Kwa-Thema) and Carletonville, male miners had previously worked in the construction sector or were retrenched from the large-scale mines. Similarly, it is unclear whether the South African legislation which makes allowance for small players in mining is inclusive of non-South African artisanal miners.

Access, however, is not the only area where legislation or other forms of state intervention can be useful. ASM occurs in conditions of great risk and danger. ASM gold miners, for instance, track seams of deposits which run along underground mine shafts below 4 kilometres. These shafts tend to be more unstable and prone to rock falls. Poisonous gas and flooding also pose grave dangers. Similarly, mining of tailings poses serious health risks with exposure to toxic chemicals such as cyanide, mercury, lead and uranium (Benchmarks Foundation, 2017). Even if granted access as artisanal and small-scale miners, these workers require health and safety protection if such mining is to constitute a viable alternative livelihood.

Davidson (1993: 315) explores the issue of transformation and upgrading of artisanal mining operations to improve their potential for profit and to minimise drawbacks. The potential can be explored through value addition and supply of raw materials for local industries. The reconfiguration of artisanal mining can take different forms depending on the interest of the actors. Munakamwe (2015: 10–11; 2017: 173) illustrates how zamazama in underground gold mining are supplying local refineries, such as the Rand Refinery, in South Africa. The context of criminalisation in South Africa makes it challenging to estimate how much of the gold is supplied to refineries by the zamazama, unlike in the case of Ghana (cited earlier).

For artisanal miners in South Africa, decriminalisation is a key intervention. This should not only be focused on permits to access and sell minerals but also include access to finance and support for marketing and appropriate technology. In addition, access to mining permits must be extended to undocumented artisanal miners in the country which is not the case in Kimberley where the process of decriminalisation has begun. According to Davidson (1993), some ASM groups may focus on setting up organisational structures (co-operatives or associations) to

facilitate upgrading and yet others may focus more broadly on building an indigenous viable mining sector. Davidson adds that experience of local participants in small-scale mining can provide a good basis on which to craft policy.

The picture becomes even more complex when reflecting on gender and the implications of policy interventions which have an impact on the cultural, political and social barriers faced by women. With regard to mining broadly, traditional systems of land ownership and tributary and customary rights largely favouring males are the framework for land appropriation, control of royalties and compensation (Amanor-Wilks, 2009: 11).

These in turn shape relations in ASM, even where the state is seeking to support women. In Tanzania, for example, the state has granted mining permits to women, but men and chiefs refuse to recognise their right to operate mines. Not only are women undermined, in extreme cases they are perceived as a threat and face violence. All of this occurs within a context in which women are marginalised in auxiliary services or processing, and thereby excluded from greater shares of the surplus extracted. Even worse, some women in ASM are not even paid a daily wage by men in control of production, and instead receive gifts (such as clothes) or nothing at all (Tallichet et al., 2005: 191–192).

This draws attention to the dynamics of inequality in ASM operations which deepen in conditions of extreme precarity. In spite of this, women working in ASM see it as an opportunity for an alternative to low incomes in subsistence agriculture, as in the case in Northern Ghana (Awumbila and Tsikata, 2010). Valiani and Ndebele in chapter 9 of this volume make a similar point regarding mining in Kimberley where women who engage in diamond production view their work positively – not only in relation to high unemployment and undervalued female work, but even in comparison with women employed underground in large-scale mines.

Along these lines, Lahiri-Dutt (2011) argues for an approach that goes beyond highlighting women as key actors in mining production, protest or reproduction, and rather asks ‘what mining means to communities’. She sums it up well:

Informal mining is yet to be deeply understood and theorised ... a new feminist epistemology of mining would focus on women and men's lives in informal extractive practices, where they neither own the land and the minerals, nor are they 'exploited' in the conventional sense as a 'working class' (Lahiri-Dutt, 2011: 11).

In Africa, where customary laws have persisted – despite being subject to change or contestation – and converged to produce an array of gendered outcomes, a holistic assessment is needed to inform policy-making. An essential precondition to crafting policy on ASM is the decriminalisation of ASM and an opening up of public discourse that begins by taking cognisance of the inequalities embedded in ASM operations.

CONCLUSION

Since 1994, South Africa has undergone a wave of liberalisation that has had a direct impact on manufacturing, but also on mining and the labour regime more broadly. The casualisation of work and the consequent expansion of the informal sector have resulted in an increasingly precarious existence for working people, with women continuing to carry the burden of work.

Policy intervention in ASM continues to be highly contested. Internationally, attempts at regulation have raised further problems and exposed tensions and contradictions between ASM and LSM. The continued criminalisation of ASM in contexts where formalisation has been attempted highlights this point. Examining the effects of policy interventions on women also exposes further contradictory outcomes. In order to promulgate effective policies, it is necessary to take on board the perspectives of ASM miners, while building an understanding of the nature of the deposits, the labour process of mining operations, linkages within the local economy and power relations within ASM operations. These can inform recommendations for policy that would work in the interest of ASM miners and so avoid deepening conditions of precarity.

ASM offers the possibility of developing specialised skills and of integrating previously excluded groups, including women and

undocumented migrants. However, interventions that seek to formalise or integrate the sector into the minerals economy do not necessarily lead to progressive outcomes. Instead, there is a risk that they will deepen criminalisation and entrench existing exclusions.

What is required is a holistic understanding of ASM operations. The importance of ASM, as a space for accumulation and establishing linkages within local economies for historically excluded groups, cannot be ignored. Therefore, support for existing operations, especially those run by groups such as women and undocumented migrants, is critical. This can take the form of technical support, access to markets, finance, work or/and residence permits, mineral and land rights, alongside prioritising health and safety. In particular, ensuring the health and safety of ASM miners calls for access to affordable technology that can facilitate this. It is also critical to enable the zamazama to trade directly in an open market to gain a fairer price while securing the inclusion of undocumented migrants. However, in the long run the nature of the support offered, as well as how it is controlled and by whom, can either undermine the interests of ASM miners or affirm them by promoting social ownership of technologies and mineral rights. The absence of such an approach to interventions will amount to a continuation of exclusions and criminalisation.

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