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A large-scale perspective on small-scale mining

Sustainable Minerals Institute

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Front cover: *Aerial of Galamsay activity, with part of Prestea town in the foreground, Ghana*

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[1] QS World University Rankings and Performance Ranking of Scientific Papers for World Universities, 2018.
[2] The University of Queensland ranks first in the world for mining and mineral engineering, 2018 Shanghai Rankings by subject.

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List of acronyms

ASM	Artisanal and small-scale mining
CASM	Communities and Small-Scale Mining
DDI	Diamond Development Initiative
GRI	Global Reporting Initiative
ICMM	International Council of Mining and Metals
IFC	International Finance Corporation
IRMA	Initiative for Responsible Mining Assurance
LSM	Large-scale mining
NAP	National Action Plan
NGO	Non-government organisation
OECD	Organisation for Economic Co-operation and Development
PNG	Papua New Guinea
RJC	Responsible Jewellery Council
UN	United Nations
VPSHR	Voluntary Principles on Security and Human Rights

Panning for gold in PNG. Photo: Assoc. Prof. Nick Bainton

1 Introduction

This paper focuses on the complexities of large-scale and artisanal and small-scale mining ("LSM" and "ASM") operating within a shared physical environment. The paper is exploratory in that the topic of interest – the LSM-ASM interface – is yet to be described or conceptualised to any significant degree in either academic or policy literatures. We use the term "interface" as the basis for characterising the many points at which LSM and ASM physically intersect at the asset level and the ways in which these interactions shape options and outcomes for both groups. Our intent is to generate discussion and constructive debate, and to identify current and future research priorities.

Current debates emphasise the dilemmas of the small-scale miner, assuming that the underlying interests of large-scale miners are already understood in exchanges between the two sectors. The tendency to operate on the basis of this assumption has meant that – after more than three decades of research into the drivers and dynamics of ASM – scholars and policy makers are not well appraised about key features of the physical LSM-ASM interface.

In this paper we engage this persistent gap, not as a matter of "fairness" or "symmetry", but to encourage a closer examination of the LSM-ASM interface. The extensive literature available on ASM frames the drivers behind these activities. This terminology aptly captures the survival and livelihoods-orientated character of the ASM sector and stands in contrast to the commercial drivers used to frame large-scale mining. To engage the interface, we have

introduced terminology associated with LSM. Terms such as "mine lifecycle", "project approval" and "risk management" provide entry points into the discussion, and help us to highlight the drivers of interactional outcomes left unexplained in the existing literature.

We acknowledge that framing the LSM-ASM interface in this way may suggest that we are less interested in "small" or "human–scale" issues. This framing may suggest that the interests of corporations are being advanced while the interests of small-scale miners are kept out of view. Our intention is not to displace the small in favour of the large. On the contrary, our objective is to show that by examining the LSM-ASM interface through the prism of large-scale resource development, we can achieve greater clarity about success factors for existing pro-ASM policy initiatives.

1.1 Methods

The paper was compiled through (i) desktop research, including a literature review and policy analysis, (ii) drawing on the applied experience of the authors, and (iii) semi-structured interviews with select representatives from large-scale companies who have deep experience at the LSM-ASM interface. We did not engage small-scale operators, policy makers, civil society or other interest groups in preparing this paper. Our methods are limited in this regard. We nonetheless hope that the work will be used as a point of reference for future engagement between large-scale operators, researchers and other parties concerned with dynamics at the LSM-ASM interface.

1.2 Structure

The paper provides a brief orientation to the topic (Section 2) before discussing issues and dilemmas that emerge at the LSM-ASM interface (Section 3). We explore references to the LSM-ASM interface in international instruments (Section 5) and corporate policy architecture (Section 6), before examining disclosures among LSM companies in sustainability reports and other public documents (Section 6). Section 7 considers implications for policy, practice and research.

1.3 Funding

The work was funded by a joint industry-university collaboration through the UQ *Mining and Resettlement Research Consortium*, hosted by CSRM. Under this initiative, pooled industry funds are matched by strategic funds from UQ and SMI. As deliberations on this topic are largely considered to be pre-competitive, all parties are committed to ensuring the public availability of consortium outputs, including this paper.

2 Brief orientation to the topic

Large-scale mining is typically associated with multi-national or multi-site companies, embedded in global capital and finance markets, and part of the international supply of mineral and metals commodities. ASM typically involves the practices of individuals, groups and communities using manual labour. Small-scale activities can also involve the utilisation of heavy machinery and operate through or supported by commercial business structures. A key feature of definitions about ASM is the link with the informal or "illegal" economy, given the generally low levels of formal recognition and regulation associated with ASM.

In recent times, ASM has become recognised as a poverty alleviation strategy and a vital source of income among rural and migrant communities. A report by The World Bank and development organisation, Pact, describes ASM as "the most important rural non-farm activity in the developing world" and estimates that more than 40 million people work in ASM globally.[3]

[3] See: https://beta.delvedatabase.org/resources/state-of-the-artisanal-and-small-scale-mining-sector.

Resource extraction – both large and small-scale – involves complex supply and demand networks. While operating at different economies of scale, LSM companies frequently have interests in places where ASM miners are active, and vice versa. In some instances, large companies will be drawn to locations based on ASM having "proven" a resource and, likewise, ASM miners can be attracted to a site based on the activities and workings of LSM operations. Case study evidence suggests that while there is a concern about LSM displacing ASM, both sectors can have significant impacts on the other.

The context within which these interests intersect varies considerably across commodities and geographies. In effect, this variation gives rise to four broad LSM-ASM interface types (Figure 1). The four types provide examples based on the commodity targeted and where on a lease area mining activities are undertaken.

These are not exhaustive, as further types can be discerned based on other factors, including for instance:

- the mining method applied
- stage in the mine lifecycle
- cross-over in labour force between the sectors
- whether the two sectors use common natural or built amenity, such as rivers or towns.

In addition, these interfaces can form irrespective of whether or not LSM and ASM are working within a single concession area, noting that multiple "types" may be present in and around a single LSM project.

There is a tendency amongst observers and researchers to focus on differences between the two sectors. There are certainly differences in scale, technology, mechanisation, formal recognition by the state, and engagement with systems of authority. Major points of difference are summarised in Table 1.

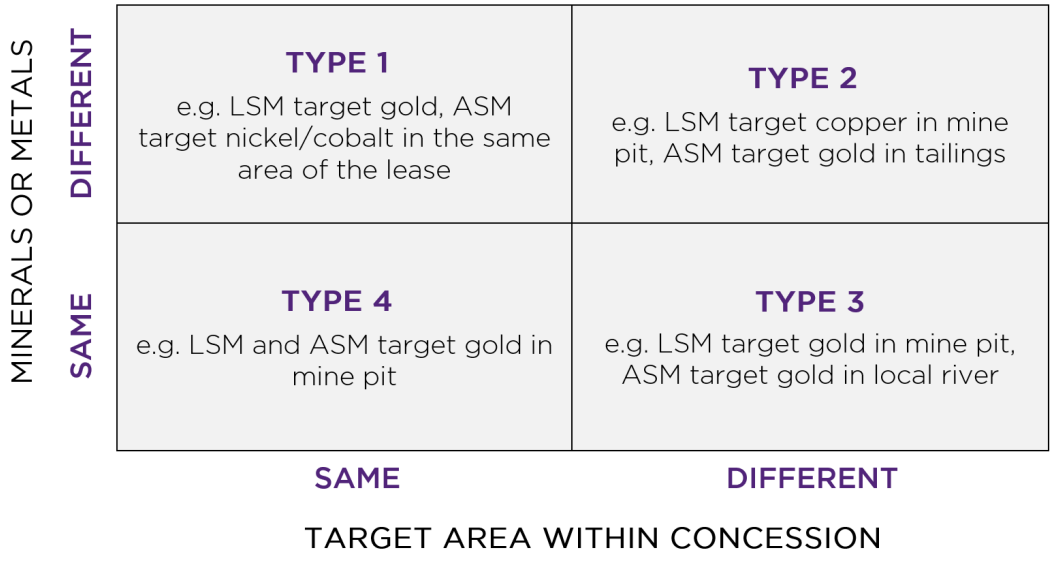

Figure 1: Basic typology of LSM-ASM interfaces

Table 1: Major points of difference between LSM and ASM

Factor	LSM	ASM
Capital	LSM is capital intensive and technology dependent.	Mining methods in ASM are comparatively more labour intensive and use simpler forms of technology.
Tenure	LSM operations are more often bound by legal instruments that define where mining can occur, and how resources are to be extracted and processed.	ASM commonly operates without legal or formal title or permit.
Lead time	Due to the level of capital required and the process for securing approval, LSM operates on lengthy lead times.	ASM miners, by comparison, can deploy machinery and labour with shorter lead times. In doing so, they can often respond more readily to changing market conditions, such as rises in commodity prices and "new finds".
Development process	LSM follows a more defined "stage-gated" project development process.	The development process for ASM is less structured and can be a seasonal (or supplementary) economic activity.
Employment	LSM employs significant numbers of people in formalised jobs, across a range of trades and professional arenas.	The number of people engaged in ASM outstrips those employed in LSM. As formal barriers for entry are lower for accessing ASM work opportunities, a larger proportion of women and younger people tend to be engaged in the sector.
Regulation	LSM companies tend to have formal policies and procedures for addressing health, safety and environment (HSE) issues. HSE considerations for LSM are more actively regulated than ASM.	ASM miners tend not to have formal HSE policies. The HSE implications of explosives, excavation and mercury use in ASM are often unregulated.
Availability of technology	Given the availability of technology and the size of concession areas granted, LSM is able to extract and process greater quantities of ore.	ASM will often operate on smaller plots, extracting resources that are closer to the surface. On a global basis, the quantum of ASM production is said to outstrip the large-scale sector.
Range of commodities	LSM extends across a wider range of mineral and metals-based commodities.	ASM is mostly concentrated on gold, coal, cobalt, diamonds, precious stones, and range of "development minerals", such as sand, gravel and stone. ASM increasingly extends to other metals, such as copper.
Institutionalisation	LSM is institutionalised through formal and standard company structures and public stock exchange listings.	ASM is organised through a variety of informal and customary structures, including co-operatives and traditional authorities.

As the differences between LSM and ASM are often stark, similarities are often overlooked – the most obvious being an interest in the economic extraction of mineral resources. Historically, policy-makers approached ASM as a small-scale version of LSM, rather than a sector with its own distinctive characteristics. While differentiation is important, similarities should not be overlooked. We bring the following points of similarity into frame:

- Both LSM and ASM engage in a local form of extraction, with product incorporated into a global network of buyers and traders.
- There are concerns about environmental impacts, health hazards and safety aspects in both LSM and ASM.
- The cumulative impacts of both sectors can be significant. Broad-scale ASM has had devastating environmental effects in certain parts of the globe. Likewise, the cumulative impacts of LSM have been significant where large mines are clustered in close proximity.
- Access to land and resources can depend on approval and acceptance through formally recognised processes and via customary or non-formal means.
- Both sectors create local employment and economic multipliers, although to different degrees in different places.
- With the increasing demand for metals and rising prices, both sectors have interests in a growing array of commodities.

2.1 LSM-ASM interface scenarios

There are many scenarios that can develop when the large and small-scale sectors form an interface. Gold is the most prominent commodity at this interface but, as the scenarios below demonstrate, it is by no means the only relevant commodity. This section describes a range of scenarios that we have engaged, and highlights the similarities and differences flagged above.

2.1.1 Totalising displacement in design

Mining developments eliminate ASM activities by design. One scenario from Papua New Guinea (PNG) is a large-scale copper-gold project in the feasibility stage. If this project proceeds, a lucrative artisanal gold mining area will be flooded to make way for a combined hydro-tailings facility. This facility and mine development will inundate more than half the current ASM workings. Informal gold mining provides the local population with a standard of living that is extremely high for people residing in such a remote part of the country. This location was established after the exploration company assisted villages to relocate from more remote upland villages. In this area, land ownership is hotly contested due to a recent history of inter-ethnic conflict.

2.1.2 Co-existence through "live and let live"

The eviction of ASM from an area of LSM does not occur in all scenarios. In the West African country of Cote d'Ivoire, one large-scale miner shares the pit area with small-scale operators on a daily basis. There has been an informal "truce" between the parties reflecting a "live and let live" philosophy. The company allows landowners to work specific areas of the mining concession on the condition that they minimise access to the area and control incursions into the pit. Over a period of 10 years, mining has become a significant local industry, providing employment and business opportunities, and triggering population growth in the neighbouring township. The township has incorporated a number of transboundary migrants, many of whom seek to participate in ASM.

Other forms of co-existence form part of government-endorsed formalisation schemes. Some governments are supporting the ASM sector through the provision of licences, access to credit, and technical assistance to improve mining methods and safety performance. In some cases, LSM companies are being encouraged to designate areas of their lease for ASM. For example, in Indonesia, applications by LSM companies for a "peoples mining area" has served to protect local ASM miners from the interests of other parties, such as political elites. Coexistence is often not legally possible without a supportive regulatory framework.

Artisanal mining camp. Photo: Assoc. Prof. Nick Bainton

2.1.3 Pit incursions and distinct commodity interests

Both sectors have an interest in different commodities, in the one location. In the Democratic Republic of Congo, a global mining company extracts copper from a large-scale open pit. In the same pit, artisanal miners extract nickel and cobalt. Neither nickel nor cobalt are of economic interest to the large-scale operator in this instance. The artisanal miners are a combination of landowners and migrant entrepreneurs who supply the informal market with these high demand "new economy" metals. Prior to large-scale mining, there were no small-scale operations in the vicinity. As the state has granted the large-scale operator exclusive rights to extract minerals, public and private security are empowered to apprehend trespassers and remove them from the pit area. Several fatalities have occurred in the eviction process.

2.1.4 Waste, incursion and perimeter protection

LSM displaces ASM, but does not prevent an interface from forming. PNG has several large-scale mines that have formed an interface with artisanal operators. Prior to LSM in the Highlands of PNG, many locals panned for gold in nearby rivers and streams. After one large-scale mine disposed volumes of waste into the local river system, locals began panning in these dumps and, later, entered the open pit.

Many locals became artisanal miners when they were first displaced by the mine and, again, displaced by the expanding waste dumps. Where ASM was once some distance from LSM operations, large and small-scale miners have come into more direct contact over time. This contact occurs via security "sweeps" of the area, which are undertaken to discourage small-scale miners from moving in. Like most gold mining operations, the presence of in-migrants is most intense when the gold price is buoyant.

2.1.5 Self-determination and indigenous territories

Traditional authorities prohibit mining on the grounds that it has deleterious effects on local custom and belief. Some regions in Colombia have long experienced conflict and violence, with criminal mining used to fund illicit activities. These activities displaced indigenous peoples from their customary land and territories. Having regained territorial control, some indigenous authorities have banned mining, other than for ceremonial purposes. While it is the case that these territories are autonomous and self-governed, under national law traditional authorities hold surface rights only.

With the Colombian peace process improving investor confidence, a number of large-scale companies are seeking to explore in indigenous territories. The interface that unfolds in these locations will depend on the large-scale sector's willingness to respect indigenous rights to free prior and informed consent (FPIC), and enter into peaceful negotiations about land access and acquisition. There are numerous examples where indigenous and tribal peoples' rights have not been respected, and where indigenous peoples have been adversely affected.

2.1.6 Forced displacement and alternative sites

LSM becomes involved in finding and securing alternative mining sites for ASM. There is a significant interface between LSM and ASM in the Guiana Shield of northeast South America. Artisanal mining occurs in the densely forested interior, an area occupied by Maroon peoples. These peoples are descendants of African slaves who escaped colonial rule more than three centuries ago and who established communities along rivers in the inland jungle areas. In one location, large numbers of artisanal miners were forcibly displaced for the construction of an industrial-scale mining complex. The area was previously a highly productive artisanal gold field governed by tribal leaders. The global mining company sought to provide an alternative artisanal mining location, but it was not as prospective as the original mine site. In the present day, ASM exists on the perimeter of the mine with an exclusion zone established to prevent direct interactions between the two sectors.

2.1.7 Market-driven encroachment, criminal activity

Complex challenges surface as the sectors each respond to market pressures and footprint dynamics. The scenario we describe here is located in Southeast Asia. This operation is a multi-pit copper-gold mining complex at the end of its economic life. Originally permitted as a single pit operation, the project expanded over time, encroaching on forest and foraging lands, and progressively displacing local communities. Early exploration for this mine was based on the ASM workings of a minority ethnic group that is no longer active in the area. When large-scale mining displaced ASM, locals transitioned to mining malachite and limestone, which is extracted and stockpiled by the company for use in the processing plant. These stockpiles are re-mined by locals who enter the concession area. The activity is classified as theft and is punishable by law. Little action is taken, however, as incursions are co-ordinated by criminal groups and supported by the military. There is little government oversight or state accountability for the activities of ASM in the area.

2.1.8 Alternative livelihoods at mine closure

An LSM-ASM interface forms at any stage of the mine lifecycle. At another large-scale operation in the south-eastern archipelago of PNG, ASM was not a significant part of the local context, either prior to, or during, the operational phase of a large-scale mine. At this site, the LSM-ASM interface formed in the final stages of mine life, after more than 15 years of operation. Post-closure activities by local artisanal and small-scale miners involve panning, and hard rock mining in the abandoned pit. The activity is considered illegal, but this is not enforced by the state as activities are conducted on customary land. Social and economic programming was not prominent in the mine closure plan, which focused mostly on

the physical aspects of mine closure. The mine owners did not foresee that locals would take up artisanal mining to replace lost income from employment in LSM at mine closure. With ASM activities now undertaken by landowners with recognised customary tenure, new exploration companies find themselves negotiating with these groups for access to the area. With the passage of time, these exploration companies will contend with a completely different interface than the previous company did.

2.2 Pre-conditioning factors

LSM-ASM interactions are pre-conditioned by factors that sit both outside and inside company control. For any institution seeking to change how the LSM and ASM sectors interact, it is necessary to understand how interactions in the interface are pre-conditioned. In this section we identify factors that either pre-date large-scale mining in these settings, or which are governed by dynamics that are beyond the exclusive control of any single institution. Power dynamics will influence local conditions, particularly where the interests of LSM are prioritised over ASM. Nonetheless, these dynamics are best analysed with background factors in frame.

The last category listed below recognises those organisational aspects that shape the interface that are *within* the control of LSM companies.

2.2.1 Governance and regulation

Sovereign states determine the legal and regulatory architecture in relation to both LSM and ASM. Some of the "external constraints" that companies cannot exert exclusive control over include: the nature and structure of host governments, the relative openness of the political system, the functionality of the public sector in supporting either LSM or ASM, and levels of corruption. The allocation and subsequent management of mineral rights across the large and small-scale sectors also falls within the purview of governments. The process for determining surface and sub-surface rights, lease approvals, and determinations about who and what is "legitimate" under law, properly rests with the state.

2.2.2 Physical environment

The physical environment includes land, air, water, flora and fauna. No single stakeholder has exclusive rights over the ownership or use of all these elements. In locations that have experienced industrial development, there may be a legacy of built infrastructure in addition to the area's natural assets. What already exists is not within the control of a large-scale company or any other party. This observation extends to geological resources. The physical existence of an ore body is inherent – pre-determined by the earth's geology. Weather and seasonal weather events fall into this same category. While human activity is influencing climate patterns globally, no single party controls the weather. These different elements of the physical environment have a determining effect on how large or small-scale mining is conducted.

2.2.3 Commodity markets

Market volatility and commodity price fluctuations are beyond the control or influence of any single large-scale mining company. The advancement of new technologies, with rapid changes in both the industrial and consumer markets in many of the world's most populated nations, have altered the conventional global demand cycles for minerals and metals. Changing market conditions inevitably have implications for operational footprints for large-scale and small-scale miners. These conditions drive the pace and scale of extractive activities, and the draw-down on land and other natural resources. Heightened demand can hasten the rate at which miners deplete available resources. Furthermore, it can create conditions for direct competition between the two sectors over access to resources and land. Even in circumstances in which LSM and ASM are targeting different resources within the same area, a rise in either one of the commodity prices can affect the nature of interactions. Volatilities in the international markets can translate into uncertainty at the LSM-ASM interface and impose previously unexpected conditions on how parties manage their respective operations.

2.2.4 Socio-economic systems

There are many dimensions and interdependent variables that comprise a socio-economic system. Every mining context has its own history, narrative, and development trajectory within which these dimensions and variables are embedded. Where ASM is present, it is common to observe a history of colonisation and resistance; poverty and repression; or conflict and corruption; amongst other complex factors. Whatever characteristics are displayed in a given mining context, the local system of production and exchange will not sit within the control of LSM, or any other sector. Even where political systems are authoritarian or exploitative, the underlying social networks and linkages that enable ASM will often survive, despite prevailing conditions and constraints. As a result, the informal social and economic system can support a resilient ASM sector, despite efforts by the state and developers to promote and enable LSM.

2.2.5 International actors

Large and small-scale miners do not control international actor groups or the engagement of these groups with a particular mining locale. International actor groups can include international finance institutions and development banks, international non-government organisations (NGOs), advocacy and civil society groups, researchers and the media. Other international actors include those involved in materials stewardship and global consumer facing brands, some of which have declared a preference for responsibly sourced ASM materials.

It is the case that LSM companies will seek to influence the activities and "presence" of these groups at different points in time, on different issues, and can generally exert greater influence than ASM miners. For example, companies may facilitate the work of an international NGO to build ASM capacity in safe mining techniques or the responsible use of mercury on their concession area. At other times, these companies may discourage or make it difficult for NGOs to access a particular mining locale if there is a risk of disrupting operational activities.

Likewise, small-scale miners may welcome the presence of an international advocacy organisation, but may discourage multi-lateral institutions that are supporting the state to attract foreign direct investment in the large-scale sector. Whatever the case, international actors bring new ideas, discourses and approaches that will influence the LSM-ASM interface.

2.2.6 Organisational factors

There are several matters that fall within the direct control of LSM companies. The effect of company-controlled decisions needs to be taken into account. While companies cannot determine the placement of the orebody or local climatic conditions, they have options in terms of the overall project design and the placement of infrastructure. The planning and pace of mine development is similarly within a company's direct sphere of influence. Companies also have influence over the level of resourcing they commit to building knowledge systems and for engagement and development activities. The culture of the organisation and the extent to which the business aligns its processes with local and international preferences are internal decisions.

A "Chan fa" machine. A popular hammer mill used by small scale miners, West Africa. Photo: Lynda Lawson

3 Dilemmas at the interface

Questions relating to the management of access and other sets of associated rights, and the consequences of different configurations for LSM and ASM operators, have proven to be challenging to reconcile.

3.1 Configurations

3.1.1 Cohabitation

When LSM proceeds where ASM is present (or is likely to be present) decisions are made about how to configure the two economic systems. As the scenarios outlined earlier suggest, some companies take a "live-and-let-live" approach to sharing a lease area. A non-competitive, cohabitation arrangement may suit from a practical perspective. This can be the case during exploration or the early stages of a mine lifecycle, and before significant impacts are experienced by communities residing in the area of interest. In these non-competitive arrangements, LSM is not seeking to access the same land at the same time as LSM. If this situation changes, the arrangement may become competitive. Issues relating to rights to land and resources for ASM may still be prominent even under this seemingly neutral arrangement.

3.1.2 Displacement

Other arrangements involve the displacement of ASM activities. This displacement may be:

- partial (e.g. a proportion of an ASM site is affected)
- temporary (e.g. displacement is a time-bound situation)
- total (e.g. permanent removal of the asset or access to the asset).

Large companies can use various means to facilitate displacement. Options can include "like-for-like" compensation, such as identifying an alternative site for ASM activities or an alternative economic resource. In these situations, companies must ensure that the

alternative is as economically productive as the original and that underlying land tenure arrangements are safeguarded. If alternative resources cannot be secured, large-scale miners have, on occasion, agreed to mine the resource and pay market price for the ore. This effectively monetises the resource, in lieu of what small-scale miners might expect to secure by way of future earnings. Other large-scale operators may lean on the state to evict ASM from their concession. This scenario can involve public and private security, spark violence and pose significant human rights risks for the parties involved.

There are instances where ASM has displaced LSM. This has occurred where governments have supported the formalisation of ASM and rejected the development or expansion a large-scale project. Other instances include LSM operators being displaced from a resource prior to securing approval to explore or mine. Privileged access to information in the study period and the means to block development applications have been linked to corruption in the approvals process. Finally, there are numerous examples where large-scale exploration projects or mines have been suspended or abandoned due to being "over-run" by ASM activities.

3.1.3 Evolution

Whatever interface forms at the outset, these arrangements are not static and evolve over time. An interface that commences with an intent to cohabitate can descend into an eviction scenario if new discoveries are made and the large-scale operator seeks rapid access to the resource to take advantage of rising commodity prices. Alternatively, in-migration into an area may render the arrangement unworkable for the large-scale operator, from a safety, security and asset impairment perspective. In this circumstance, vacant possession becomes the preferred configuration. It is also important to note that the evolution of an interface is not always linear. Scenarios can evolve to form multiple, overlapping interfaces, at different points in time, and in different parts of the same lease or concession area.

3.1.4 The "no go" option

The prospect of these and other challenges means that some parties will avoid forming or expanding their interface with ASM. This occurs when one or other party decides not to mine in locations where the other sector is already established. There may be opportunities for ASM to conduct activities in the vicinity of LSM, for example, but miners may decide to work elsewhere, or acquiesce and pursue other activities. Likewise, a large-scale operator may determine that the presence of ASM on a prospective asset exceeds its risk appetite or management capability. LSM companies have cited widespread use of child labour in ASM activities, for example, as a deterrent to capital investment. With the advent of modern day slavery laws, the use of forced, compulsory and child labour in ASM is a more prominent consideration for LSM companies.[4] Risks stemming from these and other illegal activities may pose an unacceptable level of risk, and deter companies from investing capital where these issues are present,

A "no go" decision by one or other party does not preclude the formation of an interface at a future point. Where one large-scale company walks away, another may step in and be prepared to carry the risk.

[4] Countries such as the United Kingdom and Australia have introduced modern day slavery laws designed to combat this phenomenon. These laws set out a range of measures for how modern day slavery and human trafficking should be handled, and require businesses to commitment to and disclose information to stem these practices globally.

"Chopper in, chopper out". Photo: Assoc. Prof. Nick Bainton

3.2 Large-scale dilemmas

The different configurations that form around these two sectors often result in specific types of issues. Below we identify some of the dilemmas that are considered especially challenging for LSM and which often make the interface an entangled cluster of difficult issues.

3.2.1 Initiating engagement

As a principle, it makes sense to approach ASM as a "sector" and to consider the roles, responsibilities and networks of different groups within that sector. These considerations include how people are connected to each other, through resources or other dependencies. Notwithstanding this principle, it is important to avoid approaching either sector as an undifferentiated demographic. A comprehensive view of the specific operating context should be established at the earliest possible stage of a project's lifecycle. This understanding is also important from the perspective of targeting engagement, impact mitigation and development activities as the LSM-ASM interface forms.

LSM companies often work in the absence of legitimate platforms for engagement with ASM. Part of the dilemma is navigating regulatory frameworks that fail to provide options for engagement with "illegal" ASM activities. In some jurisdictions, LSM companies must first negotiate with the state in order to avoid being seen as enabling illegal activity. LSM companies also struggle to negotiate from the basis of robust and differentiated data about the form and function of the ASM sector. In some jurisdictions, the work of NGOs and other agencies to "organise" the ASM sector has catalysed the establishment of representative bodies, with which the LSM sector is able to more readily engage.

3.2.2 Land, boundaries and encroachment

Much of the direct interaction between LSM and ASM occurs in and around mining activity. Both scales of operators are known to be attracted initially by the presence of the other. In the case of LSM, evidence of ASM workings at the prospecting stages is often regarded as a positive indication. Similarly, ASM can be

attracted to LSM sites where disturbed ground, or indeed tailings, provide improved access to valuable ore. For LSM, the issue of encroachment by ASM is comparatively easier to determine given that, in most cases, LSM companies have formal or legally registered lease boundaries to demarcate their areas of activity. In contrast, customary boundaries may not be registered or recognised. The case for claiming encroachment by LSM is more difficult due to the informal nature of the ASM sector. Governments and developers failing to invest or maintain quality cadastral systems also contributes to the lack of clarity over boundaries and entitlements.

Encroachment on land, whether for established or future workings, is perhaps the central point of contention between the two sectors. Understanding the formal and informal processes associated with different types of land tenure is therefore critical in managing issues that arise between the two sectors. The structure of land relations provides useful insights into how various sets of formal and informal rights are allocated, to whom they are allocated, and through which systems of governance land rights and entitlements are regulated in practice. This applies in the case of LSM where companies are formally granted activity-specific leases or concessions over land. It applies equally, in many cases for ASM, where the right to access and use land is subject to approval from traditional authorities. The intersection and status of these different types of rights and approval processes can result in complex operating conditions for both LSM and ASM.

3.2.3 Sterilisation of the resource

Resource sterilisation occurs when either LSM companies or ASM miners are no longer able to extract value from the resource. This can affect both sectors. Examples of LSM sterilising ASM resources can include establishing waste facilities, such as dumps or tailings dams, over known alluvial deposits, preventing any further workings. ASM can impact on LSM resources, such as when ASM miners move onto pit benches and erode the structural integrity of the pit. Parts of the resource can also be sterilised due to “under-mining” by ASM, rendering LSM working areas inherently unsafe. For example, damage caused to the pits does not technically result in the resource being sterilised, but the cost to repair benches and restore the structural integrity of the pit can render the resource uneconomic from the LSM operator’s perspective.

3.2.4 Reduced project value

The interface between LSM and ASM can create impairments in ways that are not limited to "sterilisation of the resource". For LSM operators to maintain exclusive possession over lease areas can require significant security costs and risks. At exploration, there can be a reluctance to accept or declare the presence of ASM given concerns that financiers may not accept the investment risk. High security costs in the early phases of project development reduces return on investment and, at later stages, increases operating costs. Security interventions can heighten the risk of human rights violations by the state, or abuses by private security forces or company security personnel. For ASM operators, including those operating outside formal large-scale mining leases, disruptions from private security or state police can have an impact on the productivity of workings. Similarly, law and order issues in and around settlements can negatively affect the safety and security of workers and their families.

In addition to reduced project value, the costs of not being able to formally relinquish a lease at the end of mine life due to security considerations associated with uncontrolled ASM can be material.

3.2.5 Compensating for loss and disruption

Compensation is one of the few options available to manage the effects of displacement and loss of livelihood. To account for the total, partial or temporary loss of assets or income, companies will often provide compensation to households as cash. While compensation amounts should reflect the value of the resources and opportunities forgone, some large-scale operators will seek to avoid or

minimise compensation payments, particularly where the activity is not sanctioned by the state and is considered "illegal". Similarly, large compensation payments to clear the lease area at project start up may be considered excessive because investors and management are looking to deliver projects within finite cost parameters.

3.2.6 Valuing an ASM resource

A major barrier to providing fair compensation is the difficulty associated with determining the value of artisanal-mined resources. If LSM companies intend to compensate for loss, parties must arrive at an estimated value of the geological resource. For agriculture there are established models for calculating the value of land-based assets, such as in the case of valuing land improvements or for differentiating between annual and perennial crops. There is no equivalent for ASM. As a consequence, there are no agreed models through which companies and ASM are able to arrive at a common valuation of the artisanal resource.

In an alluvial mining scenario, the upstream resource may be difficult to identify and therefore characterise. If an upstream resource is not disrupted, should it be factored into a compensation package where only the downstream activities are displaced? If an ASM resource is to be sterilised, an LSM operator could extract and process the resource on behalf of the community. If this were viable, would cash compensation at market rates constitute a fair and agreeable approach? These and other considerations are critical in the context of resource estimation and compensation.

Without a model to assist the parties in the valuation process, there will always be the problem of one party claiming the resource should be valued at a much higher rate, while the other party claims the opposite. This is not easy terrain to navigate. For example, one perspective might be that the entire resource should be compensated. Assuming this was agreeable, at what rate would the resource be paid out? Should the company follow the existing market rate? Should the community insist on a higher rate on the grounds that, if left to extract it on their own terms, they could sell at the highest price? Given that these resources often provide an intergenerational livelihood stream and belong to no one person in particular, who should the money be paid to?

An alternative perspective sometimes offered by developers is that compensation for the resource should be limited to what can be extracted by ASM miners using their current means of production. This confines the resource more or less to the surface, but without geological surveys to confirm the extent of the orebody, questions about the size of the resource are typically unresolved.

3.2.7 Managing livelihood dimensions

Managing the livelihood dimensions of LSM-induced displacement and resettlement has been identified in the academic and grey literature as an especially challenging area of practice. Cases in which ASM miners have been physically and economically displaced by LSM are highly complex. This complexity is due to the additional challenges associated with land-use competition, the lack of formal recognition surrounding the ASM sector, and the absence of reliable valuation methods to determine compensation rates for loss of mining incomes. The calculation of compensation is influenced by a broad range of variables, including rate of production, seasonal variance, access to markets, and commodity price fluctuations. It is vitally important to understand and set defensible success measures for "improvement" by assessing livelihoods holistically.

These unresolved issues have practical consequences for all parties. Livelihood restoration programs are frequently developed on the assumption that displaced ASM miners will revert to subsistence agriculture, even in cases where communities have not practiced subsistence agriculture for several generations. There is little recognition that in some instances, ASM *is* the alternative livelihood, pursued when other livelihood options are inadequate or unviable. Needless to say, these programs are usually ineffective, not only because displaced people find the replacement livelihood unattractive, but also because of the lack of

agreement over what people are entitled to in terms of losing the resource. There is a fundamental difference between valuing an underlying asset, such as an alluvial deposit, and an overlying asset, such as in the case of agriculture.

Questions also arise on the issue of livelihood restoration for people working downstream of the physical LSM-ASM interface; that is, people in other parts of the supply chain who may be benefitting economically from transporting, trading, buying or selling ore.

3.2.8 Responding to in-migration and speculation

In-migration is widely associated with ASM and is commonly depicted as a threat to industrial mining projects. The LSM-ASM interface creates a dual set of drivers for in-migration: the so called "gold rush" that comes with surface minerals and the general lure of opportunity generated by the LSM economy. In-migration can also precede a large-scale development. Where both sectors are present and in close proximity, in-migration can occur in far greater numbers than if either of the two sectors were operating alone. Similarly, in-migration where LSM and ASM are co-existent can be more difficult to prevent or to manage once people begin moving and settling into the area. The timing, intensity and pattern of in-migration can influence the range of responses available in any given context.

3.2.9 Mapping “illegal” activities

Stakeholder mapping in the context of “illegal” or “criminal” activities can pose a particular challenge for LSM companies. ASM may be linked to criminal activities, but may not be criminal itself. Understanding the ASM sector requires mapping legal, informal, illegal and criminal groups and elements. Issues of debt, kinship and seasonal pressures (e.g. food security) will have a determining influence on the sector.

From an engagement perspective, LSM companies must include the full range of groups in their stakeholder mapping process to establish who they are engaging and how their presence, activities and negotiations may affect the socio-economic context. This context includes local and more distant economic networks. Stakeholder mapping is also important from the perspective of responsible supply chains. Without a clear line of sight, large-scale operators may inadvertently enable criminal groups or introduce criminal elements into their supply chain.

Initiating engagement, or attempting to change the dynamic of the interface, can pose security threats to LSM employees. This can be particularly challenging if the LSM employee resides locally within the ASM community.

3.2.10 Understanding economic networks

It is important to understand the structural composition and networks associated with the ASM economy, and their intersection with LSM. Where activities are co-located, economic linkages are inevitable. Actual and potential points of intersection must be understood and characterised to ensure that conflict is minimised and potential synergies identified. There may be opportunities, for instance, to leverage the scale and market access of the LSM supply chain for the ASM economy. This is particularly the case under cohabitation or coexistence arrangements where ASM activities have been formalised or legitimised. Opportunities may involve production, processing, purchasing, transport, market sales, or access to supply chain knowledge and information. Disaggregated data between ASM and LSM production can be useful in this regard.

Understanding economic linkages is also important from the vantage point of livelihoods and employment. Having been dispossessed of land and resources, local people may have entered the LSM supply chain through employment or procurement. During a downturn, or when LSM moves towards closure, local people may exit the LSM supply chain and re-engage in ASM. Alternatively, it may be the

Galamsay tailings in foreground. Commercial gold mining drill lines behind. Ghana

case that over the life of the large-scale mine, local people participate in the supply chains of both sectors.

4 International standards and frameworks

Contestation over the use of natural resources, the management of environmental and social impacts, and LSM engagement practices is common. The presence of ASM raises the stakes for LSM and introduces difficult questions about who has the right to mine, using which methods, and in which locations.

In today's market, where resources can enter the supply chain from almost anywhere in the world, there are greater opportunities for ASM miners to participate in the global commodities market. According to the African Mining Vision, approximately 3.7 million people were directly engaged in ASM activities in Africa, with an estimated 30 million people relying on the sector for their livelihoods.[5] The vision highlights the prevalence and future prospects of the ASM sector, but does not speak to concerns over the LSM-ASM interface.

Against this backdrop, Section 4 describes the international policy landscape and the degree to which international standards and frameworks articulate requirements for LSM at the ASM interface.[6]

4.1 Directly relevant

Very few standards or instruments specifically address the LSM-ASM interface. After scanning more than 50 relevant instruments, standards, norms and frameworks, we identified six that engage the topic at hand. They are briefly described below, in chronological order.

[5] See: http://www.africaminingvision.org/amv_resources/AMV/Africa_Mining_Vision_English.pdf

[6] Not included in this description are the various international forums, symposiums and conferences that have engaged the topic.

4.1.1 *Working Together* (2010)

The guidance, *Working Together: How Large-scale Mining Can Engage with Artisanal and Small-scale Miners*, addresses key aspects of the LSM-ASM interface.[7] The guide was published under a partnership between the International Council on Mining and Metals (ICMM), the International Finance Corporation's (IFC) Oil, Gas and Mining Sustainable Community Development Fund (CommDev) and the international NGO, Communities and Small-Scale Mining (CASM). *Working Together* is the most comprehensive document on this topic currently available in the public domain.

Working Together has since been referenced in two of the instruments listed below, and elsewhere. The OECD guide does not provide strategies on the type of engagement required, instead it references *Working Together*. Likewise, several of the proposals put forth by the Responsible Jewellery Council (RJC) reference the guide.

4.1.2 RJC Code of Practices (2013)

The RJC is a whole-of-supply chain standard and certification initiative for gold, platinum and diamonds.[8] Commercial members must achieve certification within two years of joining the scheme. The code and associated guidance address elements of the LSM-ASM interface by requiring that members with mining operations ensure that security personnel receive training on, and operate in accordance with, the Voluntary Principles on Security and Human Rights (VPSHR), and that the human rights of artisanal miners are addressed in such training.[9]

The code also requires that where ASM occurs within an LSM area of operation, members engage ASM miners, including as part of environmental and social impact assessment processes. The code contains a section on responsible sourcing from ASM suppliers. In terms of contributing to change, LSM members are required to participate in initiatives that enable the professionalisation and formalisation of ASM (as appropriate).

Working Together includes 17 diagnostic tools to assist LSM companies to "work together" with ASM stakeholders, including:

- stakeholder engagement
- monitoring and evaluation
- ASM baseline survey
- alternative livelihood programs
- resettlement and relocation
- community development programs
- technical assistance programs
- formalisation
- organisation
- managing security
- conflict resolution
- purchasing programs
- employment of ASM miners
- contractor inductions
- segregation of mineral concession
- ASM depot on LSM mine site
- closure planning

Instruction about applying the tools across the mine life cycle is provided in Annex 3 of the guidance.

Eight metals producers are listed as certified on the RJC website, including the De Beers Group and Argyle Diamonds of Rio Tinto. BHP Billiton (Diamonds), Newmont Mining and Rio Tinto are named as founding organisations, but not members. While the RJC addresses some aspects of the interface, its reach to the large-scale sector is limited.

4.1.3 OECD Due Diligence Guidance for Meaningful Stakeholder Engagement (2016)

The Organisation for Economic Co-operation and Development's (OECD) *Due Diligence Guidance for Meaningful Stakeholder*

[7] See: https://www.commdev.org/wp-content/uploads/2015/06/Working-together-How-large-scale-mining-can-engage-with-artisanal-and-small-scale-miners.pdf
[8] See: https://www.responsiblejewellery.com/rjc-certification/code-of-practices-certification13-2
[9] See: https://www.voluntaryprinciples.org/

Engagement in the Extractive Sector offers a set of principles for responsible business conduct. It also provides guidance to mining, oil and gas enterprises in addressing the challenges related to stakeholder engagement.[10] Annexe E addresses engagement with the ASM sector. The annexe calls on large-scale operators to ensure that artisanal miners are identified and that the extent and scale of impacts are understood. The OECD requires LSM companies to design "appropriate and effective engagement activities and processes" and, in doing so, "determine whether and to what extent engagement will focus on co-operation around continued ASM activity" or focus on "how ASM activity can be ceased without causing adverse impacts to communities reliant on that activity".

4.1.4 Initiative for Responsible Mining Assurance (2016)

The multi-stakeholder Initiative for Responsible Mining Assurance (IRMA) published its first draft standard in 2014 and, following two years of consultation, a second draft. The 2016 version includes new material on ASM. In the preamble to the second draft, IRMA flags ASM as an issue of focus and invites feedback on its treatment of ASM from stakeholders knowledgeable about industrial-scale mines that "interface" with ASM.

The draft IRMA standard requires companies to engage with artisanal and small-scale miners, avoid conflict and foster positive relationships – this includes engagement about potential benefits for ASM miners from LSM companies. Companies are required to establish a comprehensive understanding of the ASM-related context prior to LSM and ASM forming an interface. The requirements specify that ASM should be included in resettlement risk assessments, other impact assessments (e.g. for health) and closure planning. Conflict analysis is also required, particularly where activities are located in a conflict-affected area. Regular assessment across all these dimensions is encouraged.

4.1.5 ICMM Performance Expectations (2018)

The ICMM is an international industry body with 27 mining and metals member companies and more than 30 national and regional associations. The organisation's mandate is to serve as a catalyst for change and "enhance mining's contribution to society".[11] Membership requires a commitment to the ICMM's 10 Sustainable Development principles. The principles have been benchmarked against leading international standards, including the Global Reporting Initiative (GRI), the United Nations (UN) Global Compact, the OECD Guidelines on Multinational Enterprises, The World Bank Operational Guidelines, OECD Convention on Combating Bribery and the VPSHR.[12] Member companies are required to report annually on their sustainability performance against the principles and have these reports independently assured.

The ICMM's new *Performance Expectations* elaborate the requirements of members in upholding its 10 principles. Principle 9 had previously required members to "pursue continual improvement in social performance and contribute to the social, economic and institutional development of host countries and communities". The new expectations provide further specificity to this principle including that companies "collaborate with government, where

[10] The OECD is a multi-country forum through which sovereign governments can work together to: share experiences; seek solutions to common problems; and set standards on a range of activities, including mining and extractive industries. There are 36 member countries, and five others that are recognised as "partners" to the OECD. See: https://www.oecd.org/publications/oecd-due-diligence-guidance-for-meaningful-stakeholder-engagement-in-the-extractive-sector-9789264252462-en.htm

[11] See: https://www.icmm.com/en-gb/publications/performance-expectations/principle-9-pes

[12] See: https://www.globalreporting.org; https://www.unglobalcompact.org/; http://www.oecd.org/corporate/mne/; http://www.worldbank.org/; http://www.oecd.org/corruption/oecdantibriberyconvention.htm; ibid.

Picking coal at overburden dumping site of Bharat coking coal Ltd., India

appropriate, to support improvements in environmental and social practices of local artisanal and small-scale mining (ASM)". While this does not specify *how* companies are to engage at the interface, it does bring the interface directly into frame and is the only reference to ASM in the organisation's mandatory suite of requirements. The ICMM is set to release additional guidance in 2019.

4.1.6 Maendaleo Diamond Standards and Certification System (2019)

Established in 2007 to parallel the Kimberly Process, the Diamond Development Initiative (DDI) is a not-for-profit organisation that brings together miners, civil society, government and the private sector to address the development needs of ASM miners and their communities. In 2019, the DDI released the *Maendaleo Diamond Standards* for artisanal diamond production.[13] The standards comprise eight pillars, with the aim of unlocking the development potential of ASM. These aims are to be achieved through responsible production protocols and a progressive certification process. The DDI has adapted the RJC and ICMM standards, re-orientating them to facilitate certification of ASM operators.

The eight pillars include: legality; consent and community engagement; human and worker's rights; health and safety; violence-free operations; environmental management; interactions with large-scale mining; and site closure. Pillar 7 (interactions with LSM) explicitly applies to the LSM-ASM interface; that is, locations where the sectors "overlap" or "are located in close proximity". This pillar focuses on improving the relationship through increased transparency, mutual respect and non-violent interaction.

[13] "Maendeleo" is a Swahili word meaning "development" and "progress". See: http://www.ddiglobal.org/what-we-do/certification/

4.2 Other relevant standards

International instruments that are relevant, but not specific, to the LSM-ASM interface are numerous. These instruments include the UN *Guiding Principles on Business and Human Rights*, the *OECD Guidelines for Multinational Enterprises*, the *IFC Performance Standards on Environmental and Social Sustainability* and the *Minamata Convention on Mercury*.[14] These instruments provide general guidance on business, human rights, environment and development matters. In other words, they are not specific to mining and do not elaborate sector-specific issues, but provide the basis for improvement and innovation in industry policy and practice.

The Minamata Convention, for example, is of increasing relevance to issues canvassed in this paper.[15] The 128 signatory states of this global treaty, including countries in South America, Africa and Southeast Asia, are required to develop National Action Plans (NAPs) for the use of mercury, including in ASM. With an increasing overlap in interests between the LSM and ASM sectors, some states are using the convention as an opportunity to engage LSM in the development and execution of NAPs. This is providing some companies with a basis upon which to legitimately engage the ASM sector, including in contexts where formalisation has not yet occurred.

Other non-specific instruments include *ILO Convention 169 on Indigenous and Tribal Peoples* and the *UN Declaration on the Rights of Indigenous Peoples*.[16] While these two instruments apply to states, they are relevant in light of the frequency at which ASM occurs on indigenous and tribal territories, and the propensity for LSM exploration and development to occur on these same territories. The ICMM's Position Statement document on *Indigenous Peoples and Mining* and associated guidance is relevant for this reason, but it does not cover ASM.[17]

In light of the frequent occurrence of conflict and violence at the LSM-ASM interface, other non-specific yet relevant guidance can be found in instruments such as the VPSHR, *International Code of Conduct for Private Security Service Providers*, *UN Basic Principles on the Use of Force and Firearms by Law Enforcement Officials*, and the *UN Code of Conduct for Law Enforcement Officials*. As other guidance, even the industry-specific VPSHR do not refer to ASM or other issues at the LSM-ASM interface.[18]

Finally, there are an increasing number of international standards focused on the minerals supply chain. One of the most well-recognised schemes is the Kimberly Process, established to prevent the trading of conflict diamonds. Other relevant instruments include: the OECD's *Guidance on Due Diligence for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas*; the joint UNICEF and OECD publication *Child Rights and Mining Toolkit*, which includes practical actions for identifying and addressing the worst forms of child labour in mineral supply chains; and the World Gold Council's *Conflict Free Gold* standard. The *CRAFT Code of Risk Mitigation*, developed by the Alliance for Responsible Mining and international NGO, RESOLVE, warrants mention. This scheme focuses on

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[14] The IFC's Guidance Note 5 on Land Acquisition and Involuntary Resettlement suggests that in the event of environmental and social impacts by project activities "other than" land acquisition or restriction of access to land use, Performance Standard 1 should apply to the avoidance, minimisation, mitigation or compensation of risk and impact. The note states that the IFC Performance Standard 5 does not apply to the loss of access to state-owned sub-surface minerals rights by artisanal miners, but that the project should nonetheless consider appropriate mitigation measures for affected people by applying Performance Standard 1. The IFC, in effect, excludes this aspect of ASM from its standards.

[15] See: http://www.mercuryconvention.org/

[16] See: https://www.ilo.org/global/topics/indigenous-tribal/lang--en/index.htm and https://www.un.org/development/desa/indigenouspeoples/declaration-on-the-rights-of-indigenous-peoples.html

[17] See: https://www.icmm.com/en-gb/members/member-commitments/position-statements/indigenous-peoples-and-mining-position-statement

[18] Neither does the scheme engage other specific topical issues. The framework is process and principles based, designed to cover a full spectrum of issues.

assisting ASM miners to negotiate better working conditions and access to fair markets. The code encourages LSM and "legitimate" ASM operations to undertake "best efforts" to co-exist and cooperate. In lieu of detailed case studies on co-existence and co-operation, the code cites *Working Together* as a key reference. As above, while these instruments may recognise issues at the interface in general terms, they do not engage the asset-level dynamics in any depth.

5 Corporate policy and reporting practice

A key constraint in the current environment is the low level of disclosure by mining companies about where and how LSM-ASM dynamics play out. Beyond corporate policy commitments, identifying and disclosing asset-level issues can have material implications, both financially and in terms of future social performance. In this section we examine LSM company policy commitments and public disclosures in relation to ASM.

5.1 Sample of companies

In order to formulate a sample for analysis, we scanned LSM websites and sustainability reports to identify companies most likely to have a direct interface with ASM.[19] The GRI was a useful point of reference. Under this framework, companies are required to report: (i) the number and percentage of operating sites where artisanal and small-scale mining takes place on, or adjacent to, the site; (ii) the associated risks; and (iii) actions taken to manage and mitigate those risks. Likewise, the Responsible Mining Index was a useful reference point, having examined more than 30 companies in terms of their disclosures on ASM. From this process, we identified 14 companies of interest:

1. AngloGold Ashanti
2. Barrick Gold Corp
3. De Beers Group (Anglo American)[20]
4. Eurasian Resources Group
5. Freeport-McMoRan
6. Glencore
7. Gold Fields
8. Harmony Gold (African Rainbow Minerals)[21]
9. Kinross Gold
10. Newcrest Mining
11. Newmont
12. Sibanye-Stillwater
13. Teck Resources
14. Teranga Gold Corp

Several major companies are excluded from this list as their public-facing profile, since 2015, has contained no material coverage of ASM. These companies include, for example, Rio Tinto, BHP and South32.

We then identified ASM-related public policy positions amongst the 12 sample companies to understand their public disclosures in sustainability reports, websites and any other accessible public domain materials (e.g. UN Global Compact "communication of progress" reports).

5.2 ASM in LSM policy

Within our sample, four companies had publicly available corporate-level policy instruments: one diamonds producer (De Beers) and three gold companies (AngloGold Ashanti, Goldfields and Teranga Gold). Across these four companies, the majority of assets are located on the African continent, with a considerable presence in West Africa.

The De Beers Group has a detailed set of requirements for ASM under its *Best Practice Principles* that cover a wide range of matters, including: assessment and engagement with ASM, human rights, sourcing from ASM, safety and security (including use of mercury), participation in formalisation initiatives, and mine closure planning. De Beers requires that

[19] Based initially on country and commodity.
[20] Anglo American owns 85% of the De Beers Group.
[21] African Rainbow Minerals own 14.7% of Harmony Gold.

An LSM community relations representative and an ASM miner in Côte d'Ivoire. Photo: Lynda Lawson

the interface is approached through active engagement, underpinned by processes of due diligence. Through this approach, the risks associated with any particular decision or strategy, including the potential for unintended consequences, such as violent conflict, should be highlighted. The company has released a *Best Practice Principles Assurance Program Manual*, which provides additional guidance on the above-listed matters. The manual and the *Best Practice Principles* requirements both make reference to *Working Together*, the OECD *Guidance on Due Diligence Guidance for Meaningful Stakeholder Engagement*, and the RJC's Code of Practices.

AngloGold Ashanti released a *Framework Guiding Co-existence with ASM* in 2016. The framework contains a broad set of guidelines and indicates that the company will take a case-by-case approach on three conditions: (i) that operations are not in conflict with host country law, (ii) that implementation supports LSM-ASM co-existence, and (iii) that human rights are not infringed upon. The framework encourages AngloGold Ashanti operations to contribute to the formalisation of ASM; support policies and practices for a viable, sustainable and legal ASM sector; geological research that helps to identify zones and deposits that can be designated for ASM; and a range of knowledge transfer initiatives that support good practice in health, safety and environmental management.

In its 2016 *Community Relations and Stakeholder Engagement Handbook*, Goldfields articulate eight performance standards, one of which is: *Engaging with Artisanal and Small-scale Miners*. The standard provides background on ASM and aims for Goldfields employees to engage with ASM communities respectfully and transparently. The standard requires that every ASM-affected project develops a specific strategy based on research about the local social and environmental conditions and engagement with a broad-range of stakeholders. Sites are required to document a strategy (short and long-term) for approaching ASM that includes: engagement, community investment, human rights, environmental issues, safety and security, and monitoring and

evaluation. While De Beers emphasises ASM issues that may emerge in mine closure, Goldfields emphasises issues in exploration.

Teranga Gold has a 62-page *Livelihood Restoration and Resettlement Policy,* last reviewed in 2012 (still current), which makes reference to ASM. The policy notes the company's commitment to formalisation of ASM as a long-term strategy that should be pursued by the state and supported by the private sector. Teranga's policy encourages operations to conduct systematically applied research and to formulate a strategy that encompasses livelihood and community development programs, relocation assistance, and transitional support in the event that ASM is negatively affected by LSM.

Finally, through our engagement with LSM companies on this topic, we discovered that there are several policy instruments under development. Newmont refers to an ASM "Strategic Framework", for instance, when describing its ASM-related activities and partnerships (see below). Other companies are actively engaged with ASM, but have not released public policy statements. The Board of Newcrest Mining, for example, has approved an ASM Strategy. At this stage, neither of these documents are available in the public domain.

5.3 Corporate reporting

A larger number of companies disclose information about the LSM-ASM interface than have formal policy frameworks. As the GRI requires LSM reporting companies to disclose ASM-related "risks" and "responses", we examined the risk types that companies most commonly disclose and their respective response strategies.

The most commonly reported risk or "issue" types were:

- intrusions of ASM onto LSM leases and concessions
- security incidents involving injury or fatality
- corporate reputational risks stemming from the LSM-ASM interface
- human rights and environmental issues
- issues relating to competition over land.

Most of these issues are named in corporate sustainability reports and other public disclosures. However, information about the history and context of the risk or issue, the dynamics and parties involved, and underlying factors, tends not to be provided. AngloGold Ashanti and Newmont provide the most detail across risks and responses. Across the board, however, detail about human rights and land access was largely superficial.

In the main, coverage of the LSM-ASM interface in corporate sustainability reports is weighted towards describing company activities and strategies. Company responses broadly align with the elements included in international policy frameworks, including engagement, rights-compatible security responses and livelihood-related matters. These responses are provided, however, in the absence of information about the risks, impacts and issues that the strategies are designed to respond to. It is, therefore, difficult to determine whether the activity or strategy is appropriate to the risk or issue present in the LSM-ASM interface. Overall, the most notable feature of public disclosures about the LSM-ASM interface is that the challenges and scenarios described earlier are not made available to consumers of sustainability reports and other public information.

6 Conclusion and next steps

There is no single LSM-ASM configuration. In each configuration, the interface between the two sectors poses a variety of risks that require careful attention. Known risks include:

- displacement and resettlement
- compensation
- land rights and exclusive possession
- safety and security
- conflict and violence
- environmental impact
- incompatible regulatory frameworks.

Due to the country settings where LSM-ASM interfaces most commonly form, we know that these issues are made more difficult by the following factors:

- geographic remoteness
- developing country status
- generally high levels of poverty
- weak systems of state and corporate governance on this topic
- customary systems of land tenure
- presence of indigenous and other land-connected peoples.

The operating environments in which the LSM-ASM interface is forming has not been well characterised by researchers or policy makers. More research is needed to understand:

- the type and nature of interface dilemmas that currently exist
- how company personnel characterise the operating context and interface issues
- how different parties engage and experience interface dynamics
- what measures are put in place to ensure that a safe functional environment is possible.

6.1 Trends

Most industry analysts agree that the global demand for minerals and metal resources will increase. To meet future demand, mining companies will need to either expand existing operations or bring new projects into development. Analysts also believe that ASM activities are likely to expand due to economic and environmental pressures. The likelihood that these expansions and new developments will result in further points of contact between the LSM and ASM sectors is high, particularly for commodities such as gold and copper. Many of the factors noted above will not change in the immediate future.

At the same time, there is a growing interest in the ASM sector from international agencies, such as The World Bank and the United Nations. Recent initiatives indicate a trend towards greater recognition of ASM rights to access and work geological resources. At the country level, this is articulated through efforts to “formalise” the legal standing of ASM through the granting of formal leases and permits by the state.

Global mining industry standards on ASM are nascent. Early developments by a small number of LSM companies signal the potential for greater focus on LSM-ASM interface issues. In the meantime, while most major mining companies do not have dedicated ASM policies, they have established or endorsed other standards that indirectly relate to how the industry engages with people in their operating context and supply chain. These policy gaps provide opportunities for recommending proactive strategies for improving interface dynamics. Equally, as interactions between the sectors intensify, the absence of directly relevant policy guidance may result in LSM companies being tested on the strength of other established but indirect instruments, such as the VPSHR.

LSM companies are also engaging with new human development and good governance frameworks, such as the UN Sustainable Development Goals. The principles underpinning these frameworks suggest that meaningful engagement with ASM would provide an opportunity for LSM companies to contribute to positive development outcomes in contexts where there is potential for an interface to form. While the application of these frameworks may open new avenues for the private sector’s contribution to human development, these aspirational frameworks do not account for the operational configurations described above.

6.2 Complicating factors

The current extent of the LSM-ASM interface is undefined. Rates of public disclosure by companies are low and other interested parties, including governments, finance institutions and universities, have not prioritised the collection and release of information about interactions between the two sectors.

The incentives to collect and disclose information about LSM-ASM interactions are mixed. Governments may be hesitant to divulge the extent of ASM workings due to the fear it will discourage investors from the LSM market. In a similar vein, large companies may not want to alarm investors who may view the presence of ASM as presenting an investment risk. For companies looking to acquire mining assets in which ASM miners are proximate and active, information about the nature and extent of engagement at the operational level is helpful in determining whether a discount value applies.

The question of "legality" continues to complicate engagement between the two sectors. LSM companies are committing to work with legal ASM but, in most jurisdictions, ASM is deemed "illegal" by the state. This creates a challenge for companies who are open to engagement, but are reticent to engage with miners undertaking illegal activities.

To date, researchers have focused their efforts on understanding the ASM sector and, in a small number of cases, on the conditions and consequences of ASM encounters with the large-scale sector. The knowledge base on ASM is largely qualitative and developed around in-depth case studies. Few comparative or multi-site studies exist in the academic literature and, at present, there is no global dataset that records ASM issues and activities by location. Likewise, no global data exists on the prevalence of assets where an LSM-ASM interface has formed.

LSM-ASM interface issues are usually linked to other sets of complex asset-level pressures, such as displacement, security and human rights, and closure. Displacement is the most well-known. Companies face difficult tasks in arriving at an equitable rate of compensation for loss of access to an alluvial orebody and for finding alternative land with similar opportunity and amenity. Companies are also confronting LSM-ASM issues at closure. In order to relinquish a lease, companies are being asked to demonstrate how they will ensure a safe lease environment in the passive stages of closure knowing that tailings and other waste facilities will be of interest to small-scale miners.

6.3 Future directions

This paper focused on the complexities of LSM companies and ASM miners operating within a shared environment, acknowledging that this interface is yet to be described and conceptualised to any significant degree. Our aim is to encourage a closer examination and a more holistic characterisation of the LSM-ASM interface.

Some LSM companies are concerned that that low levels of awareness about the LSM-ASM interface among the global mining industry increases the risk that poor performance will come to represent industry practice as a whole. There is a willingness amongst parts of the industry to increase engagement and levels of disclosure on these issues as a basis for building capability and engaging in a more open and constructive dialogue about forward pathways.

Against this backdrop, we offer preliminary thoughts on three priority areas of focus and how research might proceed in future:

- Policy developments would benefit from an alignment and greater representation of interests. To avoid future conflicts, policy settings will need to do more than address power imbalances between the large and small sectors. A key orientating question is: what type of interface outcomes should future policy arrangements be seeking to achieve?

- These interface outcomes will have material implications for government, LSM and ASM stakeholders. As a result, stakeholders will need to consider the type of operating environment they will be entering into, understanding the

constraints and consequences for other parties and themselves. This is sensitive work and will require careful proactive engagement.

- Addressing the dilemmas outlined in this paper will require 'safe spaces' in which different stakeholder groups can give voice to their knowledge and experience. These discussions will need to occur both within the LSM and ASM sectors and across public, private and civil institutions. Consideration will need to be given to issues and implications at local, regional and national scales.

To be meaningful, discussions and forums must engage critical issues. The accepted industry standard is that baseline information should be collected to support due diligence and for developers to "know and show" that they understand human rights risks. As part of this, developers and regulators must make proactive efforts to understand the implications of forming an LSM-ASM interface.

"Pails for sale". Bags for collecting wet ASM materials in a local market, West Africa. Photo: Lynda Lawson

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