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Reframing artisanal and small-scale gold mining as a livelihood strategy and the role of law in constituting livelihood assets

BY

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Thesis presented for the Degree of Doctor of Philosophy (School of Law)

in the Faculty of Commerce, Law and Management at the

University of the Witwatersrand, Johannesburg

SUPERVISORS: PROF. TRACY-LYNN FIELD and NELLIA MUTEMERI

FEBRUARY 2021

DECLARATION

I, Maxwell Chuma, hereby declare that this dissertation is my own work. The dissertation will be submitted in fulfilment of the requirements for the award of the degree of Doctor of Philosophy (PhD) in the field of Law at the University of the Witwatersrand, Johannesburg. I declare that the dissertation has not been submitted before for the award of any degree or examination at this or any other University.

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I recognise that it was my responsibility to conduct this research in an ethical manner and according to guidelines of the University of the Witwatersrand, and according to any laws or legal frameworks that may apply, as well as according to the norms and expectations of the Law discipline.

Signature: M. Chuma Date: 26 February 2021

February 2021

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ABSTRACT

The thesis considers Artisanal and Small-scale Gold Mining (ASGM) as a livelihood strategy and the role of law in mediating livelihood assets. The central research question of the study is how the law should be reformed to better facilitate ASGM as a sustainable livelihood strategy. Much of the existing research on ASGM fails to connect this economic activity to livelihoods and it is perceived negatively as a criminal activity. The same holds true for representations of ASGM in the popular media. The MPRDA, which is the primary law that governs mining in South Africa fails to address how the sector could be integrated and formalized. The approach by the Department of Mineral Resources (DMR) to formalization has been desultory.

This study reframes ASGM by considering why people engage in ASGM, the relationship between ASGM and poverty alleviation, and how it features as a livelihood strategy. Based on a review of academic literature and comparative mining laws, the study characterizes ASGM and then turns to the concept of sustainable livelihoods as developed by Robert Chambers to identify the forms of capital and assets necessary to sustain a livelihood. The study also considers approaches to formalizing ASGM and the challenges inherent in formalization. To deepen understanding of the relationship between ASGM and livelihoods in a South African context, the study undertook a limited, qualitative case study. Data was collected from a purposive sample of 10 ASGM miners through semi-structured interview questions and observations. The sample focused on the extreme level of ASGM in South Africa, as most of the participants were undocumented and illegal immigrants allegedly involved in illegal ASGM mining. The case study confirmed that the ASGM operations were unregulated and carried out informally and illegally using poor or low levels of mechanization. The sector generates reasonable income for the miners, but also perpetuates poverty as they lack a culture of saving and are vulnerable to imminent evictions. Finally, the study also examined how livelihood assets are ring-fenced by a variety of laws and institutions to understand the nexus between ASGM and livelihoods.

The study contributes to the literature by highlighting several ways to facilitate empowerment through education, financial support and access to gold ores and markets as well as different aspects that can be implemented to reduce deprivation due to negative externalities. ASGM is impeded by the miner's lack of financial, technological and skills capacity. Lastly, the study submits that ASGM can be reformed through enacting an appropriate legislative framework

with a clear outline of the legal provisions befitting the realities of the sector. Thus, the formulation and implementation of reform interventions should be driven and informed by an outcome-based policy and capacity building.

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DEDICATION

The thesis is dedicated to my father Johannes, my mother Violet, my wife Belinda, my daughter Okuhle Pearl and my two brothers Stanley and Henry and my two sister Virginia and Jennifer.

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List of Abbreviations

AMCU	Association of Mineworkers and Construction Union
AMDC	African Minerals Development Centre
AMV	African Mining Vision
ASGM	Artisanal Small-Scale Gold Mining
ASM	Artisanal Small-Scale
AU	African Union
BBC	British Broadcasting Corporation
CASM	Communities and Small-scale Mining
CGS	Council of Geo-Science
CSR	Corporate Social Responsibility
DFID	Department for International Development
DMR	Department of Mineral Resources
DRC	Democratic Republic of Congo
EIA	Environmental Impact Assessments
EMP	Environmental Management Practitioners
FILAC	Facts, Issues, Law, Application and Conclusion
GEF	Global Environmental Facility
HIV/AIDS	Human Immune Virus/ Acquired Immune Deficiency Syndrome
IDS	Institute of Development Studies
IGF	Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development
IIED	International Institute for Environment and Development
ILO	International Labor Organization
IMF	International Monetary Fund
LEDC	Least Economically Developed Countries (LEDC)
LSM	Large-Scale Mining
MACAU	Mining Affected Communities United in Action
MHSA	Mine Health and Safety Act 29 of 1996
MMSD	Mining, Minerals and Sustainable Development

MNC	Multinational Corporations
MPRDA	Minerals and Petroleum Resources Development Act 28 of 2002
MQA	Mining Qualifications Authority
NAAM	National Association of Artisanal Miners
NCAMA	Northern Cape Artisanal Miners Association
NEMA	National Environmental Management Act 107 of 1998
NGOs	Non-Governmental Organizations
NSC	National Steering Committee of Service Providers
NUM	National Union of Mine Workers
NWA	National Water Act
ODIMWA	Occupational Diseases in Mine and Works Act 78 of 1973
OHS	Occupational Health and Safety
PRPs	Poverty Reduction Plans
SAHRC	South African Human Rights Commission
SAHRC	South African Human Rights Council
SAP	Structural Adjustment Programmes
SAPS	South African Police Service
SDGs	Sustainable development Goals (SDGs
SEMAs	Specific Environmental Management Acts
SLA	Sustainable Livelihood Approach
SLF	Sustainable Livelihoods Framework
SMME	Small, Medium and Micro Enterprises
SOEs	State Owned Enterprises
SSA	Sub-Saharan Africa
SANS	South African National Standards
SSM	Small-Scale Mining
SSMB	Small-Scale Mining and Beneficiation
TAWOMA	Tanzanian Women Miners' Association
UNECA	United Nations Economic Commission for Africa
UNEP	United Nations Environment Programme

Chapter 1

The Research Problem and Its Context

Out of the ashes of the once-thriving South African gold mining industry the Artisanal Small-scale Gold Mining (ASGM) sector continues to operate and grow outside the state's legal and institutional framework in form of section 27 of the (MPRDA) which deals with licensing system of the industry.[1] This occurs in a context where persistent economic decline, retrenchments, high unemployment, and population growth have crippled livelihoods. The illegality of ASGM in South Africa prevents it from contributing to growth and development in a more positive fashion. The government continues to lose out on the full benefits accrued from mineral sales, royalties and taxes. Adverse impacts on the environment, health and socioeconomic problems result. One can ask whether better regulation of the ASGM sector could create jobs, enhance the growth of gold mining, facilitate ecological integrity and reduce environmental degradation? This study ponders this question and seeks to propose possible solutions by examining the role of law in constituting various livelihood assets.

In South Africa the decline of gold mining, which has led to the closure and abandonment of a number of mines, was due to the increased cost of mining at depth, declining gold grades, increasing risk, escalating operational and employment costs, and depleted reserves.[2] As a result of reduced gold reserves, large-scale mines responded by reducing their labor force which damaged the economic life of mine dependent communities.[3] As an alternative livelihood, many miners have resorted to ASGM, by gaining access to tailings, surface and underground abandoned mines through old access portals and ventilation shafts.[4] ASGM is not only composed of former mine workers, but includes local and foreign nationals (women included) who find this undertaking worth pursuing as a source of livelihood.

The Minerals and Petroleum Resources Development Act 28 of 2002 (MPRDA) regulates mining in South Africa and expressly aims to empower formerly disadvantaged black South

[1] Section 27 of the Minerals and Petroleum Resources Development Act 28 of 2002 (MPRDA).
[2] K Nhlengetwa & K A Hein 'Zama-Zama mining in the Durban Deep/Roodepoort area of Johannesburg, South Africa: An invasive or alternative livelihood?' (2015) 2 *The Extractive Industries and Society* 1.
[3] Ibid 1.
[4] E van der Schyff 'South African mineral law: A historical overview of the State's regulatory power regarding the exploitation of minerals' 2012 *Faculty of Law North-West University Potchefstroom Campus* 14.

Africans and seeks to reform and enable equitable to extraction, expropriation, distribution, and exploitation of South Africa's mineral resources.[5] As discussed below, the MPRDA does not provide a legislative framework to facilitate ASGM, thus allowing it to make a more positive impact on socioeconomic development. In fact, the MPRDA criminalizes mining activities that take place without a formal authorization – thus encompassing much of ASGM. Furthermore, punitive measures are provided in sections 98 and 99[6] which spell out offenses and penalties for failing to obtain the relevant authorizations.

The ASGM sector in South Africa, thus largely operates illegally, circumventing or coming into conflict with laws on property rights and trespassing, the mining authorization process, land use regulations and a host of laws dealing with environmental management, including water use regulations.

The discussion around the sector is often inclined towards negative characteristics and forces the discourse to be biased and prejudiced other than to locate general positive aspects of ASGM. Thus, illegal miners in South Africa are known as 'zama-zamas', which is loosely translated as 'to take a chance'. The zama-zamas are known to operate on disused mines without "compliance with industry standards".[7] The majority are reported to be from neighboring countries, while, others are South African citizens in search of an income.[8] Illegal mining is associated with many dangers which include personal injury, infrastructure damage, economic losses and environmental pollution.[9] Violence, corruption and turf warfare are also reported to flow from the unregulated and illicit nature of the work.[10]

Criminalization and the lack of appreciation of the ASGM sector thwarts the opportunity for poverty reduction. The negative account that identifies ASGM as an avoidable problem that needs to be inhibited inspired this study. The study aims to interrogate the socio-economic dynamics of ASGM and their contribution to sustainable livelihoods and the economics of local communities and the manner in which law frames livelihood assets in order to inform the

[5] Minerals and Petroleum Resources Development Act 28 of 2002 (MPRDA).
[6] Sections 98, 99, MPRDA.
[7] J P Casey 'Artisanal Mining: The danger that comes with the job' *Mining-technology.com* 9 May 2019 1, last accessed from https://www.mining-technology.com/features/artisanal-mining-the-dangers-that-come-with-the-job/ on 08 April 2020.
[8] J Campbell 'Illegal Mining and the Role of Zama-zama in South Africa' Council *on Foreign Relations* 16 August 2016 1, last accessed from https://www.cfr.org/blog/illegal-mining-and-role-zama-zamas-south-africa on 08 April 2020.
[9] Casey (note 7 above).
[10] Campbell (note 8 above).

development of a regulatory frame that protects these benefits. Both positive and negative aspects of ASGM need to be examined if the sector is to be wholly appreciated. The study aims to highlight new insights that may move ASGM mining from its inappropriate narrative of criminality and its historical association to illegality towards being a livelihood strategy.[11]

The following section outlines the background of the study detailing the international and local context of ASM and cascading down to ASGM. This is important to establish the broad-based underlying state of ASM specifically ASGM. The context of the study is also described through various forms of illegality that exists within the sector. Furthermore, an outline of legal regimes dealing with illegality of ASGM will be presented.

1.2. Context of ASM/ASGM

This section fleshes out how ASM/ASGM is internationally contextualized. It looks at the composition of ASM worldwide, reasons for undertaking ASM as an economic activity, policy framework concerns and how Africa through the Yaoundé Vision and the African Mining Vision seeks to realize ASM as an enterprise for poverty alleviation. Then, the national context of ASM will focus on the history of ASM/ASGM in South Africa, definition, and its current status.

1.2.1 International Context to ASM/ASGM

Artisanal mining is regarded as an ubiquitous economic activity that is particularly predominant in less economically developed countries.[12] According to Maldar, the sector occurs "in at least 70 countries in Africa, Asia and Latin America".[13] In 2017, the African Minerals Development Centre (AMDC) estimated that the people involved in ASM are nearly 30 million in nearly 80 countries the world over and almost 40 percent operate in Africa.[14] The high incidence of ASM in Africa, Asia and Latin America is ascribed to it being an alternative livelihood for the poor and vulnerable when viability in other alternatives such as agriculture is non-existent.[15] The majority of ASM workers reportedly operate in the exploitation and

[11] Intergovernmental Forum on Mining Minerals, Metals and Sustainable Development (IGF*)* 'Global Trends in Artisanal and Small-Scale Mining (ASM): A review of key numbers and issues' (Winnipeg IISD 2017) 27.
[12] C F, M L Barreto & A Attaran 'Property Theory and Artisanal and Small –Scale Mining in Developing Countries' (2011) 4 *Journal of Politics and Law* 15 1.
[13] S Maldar 'Fairtrade and Fairmined Gold: empowering responsible artisanal and small-scale miners' (Fairtrade Foundation and the Alliance for Responsible Mining London 2011) 3.
[14] African Minerals Development Centre 'Report on Artisanal & Small-Scale Mining in Africa Selected Countries Policy Profile Review on ASM (2017) 11.
[15] Maldar (note 13 above) 3.

extraction of gold and diamonds. It is also reported that 10% of the world's gold output reportedly comes from the ASGM sector.[16] Ledwaba & Nhlengetwa report that, "in sub-Saharan Africa, it is estimated that over eight million people are engaged in the ASM sector directly, and more than 54 million others rely on it for their livelihood."[17]

For many centuries ASM has been a livelihood strategy for many communities.[18] The sector managed to unite people and kingdoms as the activities have become a part of tradition. Extraction of various mineral deposits continued without challenges such as being encountered currently. This practice facilitated fair trade and friendly ties. However, the introduction of large-scale mining (LSM) resulted in loss of income for the ASM miners since most of their activities were criminalized. The researcher seeks to quickly submit that, given the history of ASM, the coming in of LSM in Africa has forced ASM to be relegated to illegal, criminal and environmentally unfriendly practice.[19]

However, according to Shen and Gunsen writing of ASM in China, over the last three decades the sector has experienced unique progression and development.[20] This development in ASM has in turn generated a high demand for mineralized land along with fuelling the characterization of ASM as a poverty and subsistence sector that causes huge environmental damage.

The expansion of ASM has been fuelled by many actors. Economic reforms promoted by the World Bank and International Monetary Fund (IMF) across Sub-Saharan Africa (SSA) have led to the privatization and closure of many state owned enterprises (SOEs) causing enormous employment losses.[21] Hilson and Potter posit, for example, that "a total of 278,000 jobs were lost in Ghana between 1985 and 1991".[22] In Zambia, mining jobs totalling 8000 were lost

[16] World Bank 'Artisanal and small-scale mining' last accessed from www.worldbank.org/en/topic/ extractive industries/brief/artisanal-and-small-scale-mining on 09 April 2020.
[17] P Ledwaba & K Nhlengetwa 'When policy is not enough: prospects and challenges of artisanal and small-scale mining in South Africa' (2016) *Journal of Sustainable Development Law and Policy* 7 28.
[18] ANGLOGOLD ASHANTI 'Addressing Artisanal and Small-Scale Mining' (2012) 1.
[19] G Hilson & C Potter 'Structural adjustment and subsistence industry: artisanal gold mining in Ghana' (2005) 36 *Development and Change* 124.
[20] L Shen & A J Gunson, 2006 'The role of artisanal and small-scale mining in China's economy' (2006) 14 *Journal of Cleaner Production* 427.
[21] S M Banchirigah 'How have reforms fuelled the expansion of artisanal mining? Evidence from sub-Saharan Africa (2006) 31 *Resources Policy* 167.
[22] P A Boateng, I Akuamoah-Boateng & A F Karikari 'Informal Sector Business Proliferation: Harnessing Potentials for Development in Ghana' (2013) 6 *International Business and Management* 86.

during the period between 1992 and 1999.[23] Countries in SSA that rolled out "structural adjustment programmes" (SAPs) were seriously short-changed due to underperforming macroeconomic performances because the SAPs failed to stimulate economic expansion and development.[24]

Due to the privatization of many SOEs many jobs were lost.[25] Soon after the SAP era, unprecedented poverty and mass unemployment levels due to job cuts, notwithstanding some economic progress has resulted. Haselip and Hilson argue that "at the time of implementing SAP, countries were facing numerous economic crises and did not have any support programs to act as safety nets to cushion the impacts of SAP on vulnerable people".[26] This dire situation positioned ASM as a panacea to economic collapse, severe poverty levels and joblessness; i.e. as a livelihood strategy with the capacity to rapidly grow and sustainably develop the communities ravaged by SAP and other economic factors.

In a nutshell, in SSA many SOEs have suffered many challenges, including non-capitalization. For recapitalization, present governments were advised to liberalize policies to be able to lure large scale corporations to come and invest.[27] This led to the arrival of big corporations with a huge capital investment strategy. They were granted rights to explore and mine mineralized portions of land which were already occupied by local artisanal miners within the indigenous communities.[28] Subsequently, the livelihoods of the host community were disrupted and communities were displaced.[29] As a result, a large number of people were recruited into illegal mining on LSM concession because they had no other livelihood alternative.[30] However, this was not true on the area under study because illegal mining was undertaken on disused and abandoned mines.

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[23] J Kangwa 'Mining and Society: Privatisation and Social Management' (Report prepared for African Institute of Corporate Citizenship, Johannesburg, South Africa2001*)* last accessed from http://www. iied. Org/mmsd/mmsd_pdfs/168_kangwa. pdf on 08 April 2020.

[24] J Haselip & G Hilson Winners and losers from industry reforms in the developing world: experiences from the electricity and mining sectors' (2005) 30 *Resources Policy* 99.

[25] G Hilson 2004 'Structural adjustment in Ghana: Assessing the impacts of mining-sector reform' (2004) *Africa Today* 55.

[26] Haselip & Hilson (note 24 above) 99.

[27] E Fisher 'Artisanal gold mining at the margins of mineral resource governance: A case from Tanzania' (2007) 25 *Development Southern Africa* 210.

[28] H Jenkins & L Obara 'Corporate Social Responsibility (CSR) in the mining industry–the risk of community dependency' (Queen's University Belfast Dublin 2006) 5.

[29] G Hilson and J McQuilken 'Four decades of support for artisanal and small-scale mining in sub-Saharan Africa: a critical review' (2014) 1 *The Extractive Industries and Society* 114.

[30] G Hilson 'Strengthening artisanal mining research and policy through baseline census activities' (2005) 29 *Natural Resources Forum* 144.

As a final point, rising prices of minerals on the international market also led to an increase in ASM. Moreover, the ever-growing global demand for precious metals has forced the rise in the price of these minerals and inevitably the growing number of mining operations. People began engaging in ASGM with the hope of making quick gains because the sector offered an opportunity to operate without going through the requisite application and formalization processes.

Over the previous two decades, a research-based narrative has developed emphasizing that ASM is a vital economic operation in SSA.[31] Yet the insights gained from research have not always been able to influence government policy in some mineral-rich developing countries and change perceptions of the sector, as the situation in South Africa shows.

In 2002, for example, policy makers from African ASM countries, developmental partners and individual ASM miners came together in Cameroon to formulate the Yaoundé Vision (one amongst other initiatives that informed the African Mining Vision) to reform the ASM sector. It is a part of the continental policy initiative specifically to transform the mineral sector. [32] The vision's goals sought to rethink ASM legislation, strengthen and improve institutions, policies and processes as well as reduce child labor, promote gender equality and improve safety and health.[33]

The Yaoundé Vision recommended that ASM be integrated into economic and Poverty Reduction Plans (PRPs) as it is a key poverty alleviation activity.[34] Moreover, the vision sought to sustainably reduce poverty and improve livelihoods in communities by the year 2015.[35] Its intentions were aligned to Communities and Small-scale Mining (CASM), together with a World Bank directed initiative to mitigate environmental impacts of ASM, develop training

[31] C Echavarria 'What is legal? Formalising artisanal and small-scale mining in Colombia' (IIED, London and ARM 2014) 30.
[32] Oxfam Briefing Paper 'From aspiration to reality; Unpacking the African Mining Vision' (2017) 8.
[33] United Nations Economic Commission for Africa [33]'Seminar on Artisanal & Small-Scale Mining in Africa: Identifying Best Practices & Building the Sustainable Livelihoods of Communities Recommendations' (Yaoundé, Cameroon 2002) 2.
[34] African Union 'Africa Mining Vision' African Union' (Addis Ababa 2009) 31, last accessed from https://womin.org.za/images/regional-and-global-perspectives/africa-region-law-and-policy/African%20Union%20-%20Africa%20Mining%20Vision%202009.pdf on 13 February 2020.
[35] United Nations Economic and Social Council 'Africa Review Report on Mining' (Economic Commission for Africa Addis Ababa, Ethiopia 2009).

marked to improve health of artisanal miners and increase implementation of integrated policy and practice models.[36]

In 2009, the African Union (AU) with the support of the United Nations Economic Commission for Africa (UNECA) developed the African Mining Vision (AMV). The AMV seeks to achieve transformation within the Africa's mining sector into a "knowledge-based economy" focusing on the "optimum exploitation of mineral resources to underpin broad-based sustainable growth and socio-economic development".[37] Significantly, the AMV acknowledges the importance of ASM to mining economies and to provide a diversified system that has the propensity to enhance alternative livelihoods that will advance grassroots purchasing power.[38] The Vision maintains that the sector has potential to catalyze small scale enterprise for poverty alleviation.[39] It further highlights that ASM "continues to face challenges and still lacks regulation specific to its needs".[40]

However, these visions are 'white elephants' while ASM remains illegal, as in South Africa. Ledwaba and Mutemeri accordingly argue that "South Africa, as a signatory of the AMV, needs to domesticate the vision to enable "the development of an appropriate regulatory framework and support systems for the ASM sector".[41]

In a number of developing countries, mining reforms have paved the way for the development of a dual economy: A division of LSM, enjoying vast support and on the other hand, ASM, marginalized and ignored.[42] According to Fisher's analysis of social exclusion, "mining reforms have paved the way for socially excluding ASM from fully participating in the formal economy".[43] Marginalization of ASM is due to lack of access to factors of production such as

[36] The South African Institute of International Affairs (SAIIA) 'Artisanal and Small-scale Mining in Africa: Opportunities and Challenges' 01 March 2012, last accessed from https://saiia.org.za/research/artisanal-and-small-scale-mining-in-africa-opportunities-and-challenges/ on 09 April 2020.
[37] African Union (note 34 above) 31.
[38] Ibid 29.
[39] A A Debra, I Watson & D P O Quansah 'Comparison between artisanal and small-scale mining in Ghana and South Africa' (2014) 114 *Journal of the Southern Institute of Mining & Metallurgy* 913–21 at 913.
[40] Ibid.
[41] P Ledwaba & N Mutemeri 'Institutional Gaps and Challenges in artisanal and small-scale mining in South Africa' (2018) 56 *Resource Policy* 141.
[42] Banchirigah (note 21 above) 166.
[43] Fisher (note 27 above) 212.

land, capital and machinery. However, ASM has continued to gain momentum as it keeps growing and absorbing labor in developing countries.[44]

An additional duality occurs in ASM, between registered (legal) and unregistered (illegal) miners. The former undertakes registered dealings with mining rights and may even have valid or legal rights to land that they operate on, while the latter regularly called artisanal miners, are involved in mining activities illegally on land to which they hold no legal right. Moreover, artisanal mining generally consists of persons or families who rely on traditional operations, whereas legal Small-Scale Mining (SSM) is more wide-ranging and mechanized in contrast to artisanal mining. These distinctions are further developed in Chapter 2 of this thesis.

1.2.2 Context of ASM/ASGM in South Africa

In order to understand the context of ASGM in South Africa, one needs to unpack the dominant factors affecting the sector, including the definitions, history of mining in the country and its status. The South African minerals sector is one of the most diverse in the world. South Africa is believed to be one of the leading producers of platinum, diamonds and gold and also the largest holder of chrome, manganese, platinum group metals, vanadium, and vermiculite deposits. South Africa was also formerly the leading producer of gold and diamonds.[45] Ironically, the formal mining industry was founded on artisanal gold mining after George Harrison's finding on Langlaagte Farm in 1886.[46] The earliest discoveries were made by "the Streuben Brothers (Fred and Harry), who owned parts of the adjoining farms Sterkfontein and Wilgespruit in what is now known as Roodepoort"[47] in the 1880s. Nhlengetwa & Hein maintain that, "within a decade, Johannesburg's mining industry had grown from a panning (artisanal) and bonanza findings economy to the world's largest gold producer".[48]

[44] G Hilson & J Monhemius 'Alternatives to cyanide in the gold mining industry: what prospects for the future?' (2006) 14 *Journal of Cleaner production* 1168.
[45] Staff Writer 'These are the biggest gold producing countries in the world' *Business Tech* 16 July 2018 1, last accessed from https://businesstech.co.za/news/business/258617/these-are-the-biggest-gold-producing-countries-in-the-world/ on 09 April 2020.
[46] Nhlengetwa & Hein (note 2 above) 1.
[47] City of Johannesburg 'Early Pioneers: The Struben Brothers last accessed from https://www.joburg.org.za/play_/Pages/Play%20in%20Joburg/Culture%20and%20Heritage/Links/Early-pioneers-The-Struben-Brothers.aspx on 08 April 2020.
[48] Nhlengetwa & Hein (note 2 above) 1.

Mining operations in South Africa vary from large scale to junior and small-scale mining. LSM in South Africa is characteristically capital intensive, highly mechanized, and with large investments, and mining laws are biased towards this type of mining.[49] The categorization of ASM which also includes SSM like elsewhere around the world is difficult to classify and define.[50] The SSM sector is believed to include all minerals-related operations of small organizations. A small organization for purposes of mining and quarrying is described in the National Small Business Act 102 of 1996, as an enterprise of "less than 50 employees, a turnover of less than R7.5 million and the gross asset value of less than R4.5 million".[51] The size of the SSM is believed to have grown since the dawn of democracy as more people are involved in small scale mining.

The Department of Mineral Resources (DMR) has taken actions to develop and promote small-scale mining. It recognizes that small-scale mining sector includes artisanal or subsistence mining activities, sub optimal formal undertakings and entrepreneurs with upfront capital investment.[52] According to the DMR's website, the department is working to legalize small-scale mining operations: The Directorate of Small-scale Mining seeks to help aspiring miners through "mining feasibility study, Environmental Impact Assessments, establishment of a legal entity and guidance towards the identification and evaluation of mineral resources".[53]

There is, however, a substantial lack of consistent data.[54] There has been some earlier estimations that the number of people active in ASM in South Africa was around 20000.[55] However, according to Buxton, current estimates of people involved in ASM are around 10000.[56] The number of people within the ASM sector legally operating was estimated to be 6000.[57] The SAHRC estimates that illegal artisanal mining has involved 30,000 people over

[49] A Fairtrade Foundation Report (Fairtrade Gold: an industry briefing January (2015) last accessed from https://www.fairtrade.org.uk/~/media/fairtradeuk/media%20centre/documents/gold%20policy%20reapaort%20-%20final%2013%2001%2015.ashx on 08 April 2020.
[50] N Mutemeri & F W Petersen 'Small-scale mining in South Africa: past, present and future' (2002) 26 *Natural Resources Forum* 287.
[51] National Small Business Act of 1996.
[52] Department of Mineral Resources (2019) last accessed from https://www.dmr.gov.za/mineral-policy-promotion/small-scale-mining on 11 April 2010.
[53] Ibid.
[54] P Ledwaba 'The status of artisanal and small-scale mining sector in South Africa: tracking progress' (2017) 117*Journal of the Southern African Institute of Mining and Metallurgy* 37.
[55] Mutemeri and Petersen (note 51 above) 287.
[56] A Buxton 'Responding to the challenge of artisanal and small-scale mining' (IIED Sustainable Markets Papers 2013) 3.
[57] Department of Minerals and Energy (2007).

the past ten years.[58] Decommissioned and abandoned mines provide illegal miners easy access into underground shafts to sustain livelihoods.[59]

It is also expected that "artisanal and small-scale miners are both active in a range of commodities, depending largely on the availability of deposits, ease of mining, processing, and extraction, and access to markets".[60] Mutemeri and Petersen further submit that minerals mined within the sector are coal, diamonds and gold with construction material such as sandstone, sand and granite dominating.[61] Due to the nature of ASGM, the ore extraction techniques are limited to, open pit and primitive underground excavations.[62]

In contrast to LSM and SSM, in South Africa ASM is considered a "primitive type of mining, characterized by individuals or groups exploiting deposits usually illegal with the simplest equipment".[63] According to the Minerals Council South Africa (2017) "at least 14,000 people are involved in 'zama-zama' mining activities alone".[64] The predominant characterization of the sector in South Africa is that it is informal, unregulated, employing basic tools to extract and process gold.[65] ASM is mainly labor intensive compared to the large-scale industry, which is highly mechanized.

ASGM miners enter abandoned underground mines through blasting concrete sealed entrances or by gaining access via old access portals and ventilation shafts. Mining takes place through a network system with clearly defined roles. These roles include gold diggers who go underground, crushers, gold burners, purifiers and gold buyers.[66] According to Nhlengetwa & Hein, roles are also extended to underground work along tribal and national lines to include, "laborers who break rocks from old stope faces, those who shovel sand into bags, crushers, and those who process gold in underground kitchens where it is smelted".[67]

[58] South African Human Rights Council 'Investigative Hearing, Issues and Challenges in Relation to Unregulated Artisanal Underground and Surface Mining Activities in South Africa' (2014).
[59] K Mabuza 'Scourge of illegal mining' *News clipping The Sowetan*, 30 April 2012 at 1, last accessed from https://www.sowetanlive.co.za/news/2012-04-30-scourge-of-illegal-mining/ on 09 April 2020.
[60] Mutemeri & Petersen (note 50 above) 289.
[61] Ibid.
[62] Ibid.
[63] B Mamadou 'Regularizing Informal Mining A Summary of the Proceedings of the International Roundtable on Artisanal Mining' (World Bank 1996).
[64] Mineral Council South Africa (2017).
[65] A Fairtrade Foundation Report (note 50 above) 48.
[66] Nhlengetwa & Hein (note2 above) 4.
[67] Ibid 4.

Much of this activity is illegal or associated with illegality.[68] The illegality of ASM in South Africa takes different forms. First, it often happens in formal mines where formal workers conduct illegal undertakings, either while at work (deserting their working places) or in the course of their leave periods.[69] The other form of illegal mining takes place in mines that have long been abandoned or closed where the miners use explosives to detonate open concrete lids of old surface channel entrances.[70] Illegal mining that exists in formal mines qualifies to be criminalized under trespassing laws while the illegal mining in abandoned mines could be considered to constitute part of the informal livelihood strategy which "involves the poor scrapping off left over traces of minerals dumped by big business as profits from shafts dwindle".[71] The attention of this thesis is in the latter form of 'illegal' ASGM, with a focus on how the law mediates livelihood assets in this case.

The illegality of this form of ASGM has many layers. Firstly, it is assumed that the ASGM is being carried out by illegal immigrants. The whole Southern African region has high unemployment and poverty, resulting in a large number of illegal immigrants entering South Africa from neighboring countries.[72] Johnson states that, "the confluence of joblessness, easy access to unprotected mines and a surge in the price of gold around 2000 led to a second gold rush for unemployed miners".[73] The (then) Chamber of Mines estimated that up to 70 percent of illegal artisanal miners were illegal immigrants.[74] It is believed that some of these immigrants used to work for the gold mines, but due to loss of employment they ended up trading illegally. Moreover, according to Nhlengetwa, "most of the illegal miners are young African men (though not all) between the ages of 15 and 30 and many are legal or illegal immigrants from Zimbabwe, Mozambique and Lesotho, and have a taught skill that they have learnt from other illegal miners or elders".[75]

These miners reportedly create a second layer of illegality. They comprise of a network of trained experts in gold and mercury trade as well as money laundering.[76] Several efforts put in

[68] See further section 1.2.2. below on the legal regulation of ASM.
[69] Chamber of Mines of South Africa (2014).
[70] Ibid 13.
[71] J Munakamwe 'Precarious Work: Organizing the 'Bottom' of the Supply Chain' (2014) *African Centre for Migration & Society (ACMS) 15.*
[72] Ibid 9.
[73] C Johnson 'Lethal toll of informal gold mining' *Daily Maverick* 17 August 2016, last accessed from https://www.groundup.org.za/article/lethal-toll-informal-gold-mining/ on 12 January 2020.
[74] Chamber of Mines of South Africa (note 69 above).
[75] Nhlengetwa & Hein (note 2 above) 4.
[76] Ibid 4.

place to curb illegal mining such as the decommissioning of mines, arresting of the suspect and closing of the holes has not been successful.[77] Illegal mining has been associated with natural and anthropogenic disasters whereby miners are exposed to risks such as rock falls, gas explosions, and turf wars emanating from different camps contending for profitable working space.[78]

Communities within where ASM activities occur are exposed to several social ills such as substance abuse, prostitution, child labor, and xenophobic attacks, creating a third layer of illegality. The sector is understood to have ruined the "social fabric of mining communities by fear, coercion, human rights abuses, prostitution and substance abuse".[79] The prevailing disastrous conditions prevent the sector from providing on critical social and economic objectives, such as generating formal employment as well as promoting and enhancing quality of life in mining areas.

Finally, illegal miners face a plethora of substantial safety and health hazards. These risks consist of rock falls, high levels of toxic gases, mine collapse due to support pillars being weakened by the activity, and fires.[80] According to Johnson, "the real cost of illegal mining is not the lost gold, but the attendant damage to mine infrastructure as illegal damage to the mines is probably 50 times greater than the actual gold loss".[81]

The SAHRC submits that there are numerous violations and contradictions within the ASGM sector, which undermine a number of significant rights protected under the Bill of Rights in the 1996 Constitution.[82] These rights in Chapter 2 of the Constitution of the Republic of South Africa, include "the rights to equality and dignity, to life, to an environment not harmful to health and well-being, to the choice of trade, to fair labor practices, to secure tenure and equitable access to land, and to information".[83] For example, fair labor practices cannot be applied under labor laws because there is no employment relationship. SAHRC report that there

[77] Department of mineral Resources 'Speech by the Honorable Deputy Minister GG Oliphant in the debate on illegal mining in South Africa, National Council of Provinces, Parliament' (13 October 2016).
[78] N McCain 'Police arrest 35 'zama zama' miners after Stilfontein turf war breaks out' *News24* 20 December 2020.
[79] M C Mkhize 'New interventions and sustainable solutions: Reappraising illegal artisanal mining in South Africa' (2017) 61 S*outh African Crime Quarterly* 69.
[80] Nhlengetwa & Hein (note 2 above) 4.
[81] Johnson (note 723 above) 3.
[82] South African Human Rights Commission (note 58 above) 60.
[83] Chapter 2 on the Bill of Rights, Constitution of the Republic of South Africa, Act 108 of 1996.

is uncertainty of responsibility regarding mining accidents as mining companies avoid responsibilities with regards to safety and environmental management issues.[84]

This thesis, however, argues that the illegality of the sector extends beyond these layers to encompass illegalities associated with a variety of livelihood assets.

The forms of illegality outlined above flow from the initial criminalization of the economic activity: The form of mining undertaken by artisanal miners. According to Johnson, "the problem with criminalization is that it requires a massive amount of manpower and resources to find, apprehend and prosecute all those involved".[85] There are, however, inadequate resources available to the law enforcement agencies (such as the police, immigration, prosecuting authorities and border controls) to deal with illegal artisanal mining.[86] The method of policing a mining area with too much force, raiding miners or "waiting to arrest those who emerge from mine workings, is punitive and sets the tone for battle". In August 2015, reports across Johannesburg described a "standoff between the police and unlawful artisanal miners at an old mine shaft in Daveyton, East of Johannesburg".[87] Similar activities are reportedly happening on the West Rand daily.[88] Worker organizations such as trade unions "have turned a blind eye as they also perceive this type of mining as illegal. Miners, however, have devised their own resistance strategies as they attempt to cope with police brutality and other challenges they encounter in their working lives". In the mining village of Blyvooruitzicht, "the situation has been almost impossible to contain, especially with artisanal miners also fighting amongst themselves".[89]

There are other problems with enforcement unrelated to resources. For example, it is difficult to charge an illegal miner for trespassing on mineral rich land as many might be loitering around such lands. Secondly, "surface laws do not relate to underground resources".[90] This is why the South African Police Service (SAPS) cannot search and arrest miners underground. Furthermore, "illegal artisanal miners are sometimes not "stealing gold" from actively operational mines".[91]

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[84] South African Human Rights Commission (note 58 above) 62.
[85] Johnson (note 73 above) 3.
[86] Ibid.
[87] J Love 'Violent threat, real opportunity in zama zama gold rush' *Mail & Guardian* 29 August 2015 last accessed from https://mg.co.za/article/2015-08-29-violent-threat-real-opportunity-in-zama-zama-gold-rush/ on 10 April 2020.
[88] Munakamwe (note 71 above) 15.
[89] South African Human Rights Commission (note 79 above) 37.
[90] Mkhize (note 79 above) 69.
[91] Munakamwe (note 71 above) 12.

Heavy-handed approaches to dealing with illegal ASM as a criminal activity leave little space for deliberation on alternatives.[92] For a space for alternatives to open, one must imagine an ASM sector unfettered by illegality and understand the systemic issues driving engagement with the activity. It is significant to consider the push factors and other underlying causes that drive individuals to partake in illegal mining as a precondition for effective interventions.[93]

The status of ASGM in South Africa resonates with the African Mining Vision's position that the sector continues to encounter difficulties and still lacks regulation particular to its specific needs. Thus, the sector consequently fails to act as a source of livelihood to alleviate poverty and improve well-being. The following subsection elaborates on the legal framework that adds to this situation.

1.3 Legal regulation of ASGM in South Africa

The purpose of this section is to outline the range of legal provisions that constitute the legislative framework against which illegality of ASGM in South Africa exists.[94] Ambiguous provisions for a mining permit under the MPRDA, land access, environmental management, occupational health and safety and labor relations are the areas that will be covered.

The South African mining sector is principally regulated by the Mineral and Petroleum Resources Development Act, 28 of 2002 (MPRDA), supported by other laws. The MPRDA became effective on 1 May 2004. The MPRDA regulates all mining activities which include offshore, deep, shallow and surface mining. Prior to the enactment of the MPRDA, mining was regulated by the Mines and Works Act 12 of 1911, which was replaced by the Mines and Works Act 27 of 1956, which was later succeeded by the Minerals Act 50 of 1991, before being substituted by the current and primary MPRDA.

The MPRDA's main aim seeks to equitably provide access and rights to any interested parties and sustainable development to the nation's minerals and petroleum resources.[95] The Act recognizes that South Africa's mineral and petroleum resources belong to the nation and that the State is the custodian thereof. It reaffirms the State's commitment to bring about fair and equitable right of entry to South Africa's mineral and petroleum resources and acknowledges

[92] Ibid.
[93] S Busilacchi et al. 'Drivers of illegal livelihoods in remote transboundary regions' (2018) 23 *Ecology and Society* 10.
[94] A more detailed account of how law constitutes livelihood assets used in ASM is set out in Chapter 5.
[95] Preamble MPRDA.

the promotion and development of grassroots, marginalized mining affected communities. Moreover, the Act upholds the State's responsibility and oversight to safeguard the environment by ensuring that the benefits of present and future generations are not jeopardized by the present mining operations Thus, the Act promotes socio-economic development by enabling and creating internationally competitive regulatory and administrative regimes as well as an environment that ensures sustainable development of mineral and petroleum resources.[96]

The MPRDA does not distinguish between artisanal and small-scale mining. The MPRDA, makes no mention of ASM, but makes provision for a mining permit which embraces those operations that would normally be recognized as ASM, based on the extent of the mining area, that is, physical size of an activity (limited to not more than 5 ha) and the period of the mining operation (2 years). Debra et al states that, the impact has been debatable in so far as the mitigation to the vulnerability context of the participants and the general mining communities directly and indirectly dependent on artisanal mining for a living is concerned.[97] As the vast majority of ASM miners will not be able to obtain a mining permit as the mining authorization of smallest scale, they operate illegally, and their activity is criminal.[98]

Not only the activity, but the assets that ASGM miners use are framed by laws. Access to these assets is therefore mediated by the law. To conduct ASGM activities, miners require access to reserves of gold. However, gold is both a 'mineral' under the MPRDA and a 'precious metal' under the Precious Metals Act (No. 37 of 2005).

> "Mineral is defined in the MPRDA as **'**any substance, whether in solid, liquid or gaseous form, occurring naturally in or on the earth or in or under water and which was formed by or subjected to a geological process, and includes sand, stone, rock, gravel, clay, soil and any mineral occurring in residue stockpiles or in residue deposits, but excludes (a) water, other than water taken from land or sea for the extraction of any mineral from such water; (*b*) petroleum; or (*c*) peat."[99]

'Precious metal' is defined by the Precious Metals Act as "*(a)* the metal gold, any metal of the platinum group and the ores of such metals; and (b) any other metal that the Minister has declared by notice in the ***Gazette*** to **15** be a precious metal for the purposes of this Act, and the

[96] Ibid.
[97] Debra and Watson et al (note 41 above) 919.
[98] Sections 98 and 99, MPRDA.
[99] MPRDA.

ores of any such metal." This means that the object of their activity is brought within the ambit of two different regulatory frameworks.

Section 5 (3) (a) of the MPRDA states that, any holder of any specified right may respectively for the purposes of prospecting, mining, exploration, or production enter together with his or her machinery and employees onto the land to conduct any activity related to such a right.[100] The ASGM miners contravene this section because they operate without any right to enter the land to which such right relates. Furthermore, sections 5 (3) (d) and (4) (a) articulate that use of water from a natural spring or stream flowing past on the land meant to use for exploration, extraction, prospecting, and production purposes subject to the National Water Act, 1998 is permissible to any holder of a prospecting, mining, exploration or production right. The ASGM also violate the law by using water for various purposes in their activities a right.

> Section 5(A) of the MPRDA stipulates that; "no person may prospect for or remove, mine, conduct operations, reconnaissance operations, explore for and produce any mineral or petroleum or commence with any work incidental thereto on any area without-a) an environmental authorisation, b) a reconnaissance permission, prospecting right, permission to remove, mining right, mining permit, retention permit, technical co-operation permit, reconnaissance permit, exploration right or production right, as the case may be; and *(c)* giving the landowner or lawful occupier of the land in question at least 21 days written notice".[101]

Sections 98 subsection (i), (ii), (iii), (iv), (v) and 99 of the MPRDA spells out offenses and penalties (fine or imprisonment) for contravening these provisions.[102]

According to the MPRDA, anyone desiring to conduct any mining operation is required abide with the requirements of the National Environmental Management Act 107 of 1998 (NEMA) should any of their associated activities (for example roads, pipelines, the generation of waste) trigger a Basic Assessment or Scoping and full Environmental Impact Assessment.[103] The Environmental Impact Assessment Regulations (2014) regulation 26 states that "(a) requires an environmental authorization to specify (i) the name, address and contact details of the person to whom the environmental authorization is issued; (ii) the period for which the environmental

[100] MPRDA.
[101] MPRDA.
[102] Ibid.
[103] Ibid.

authorization is granted; and (iii) the date on which the activity is deemed to have been concluded".[104] Moreover, compliance towards the requirements for the prevention, general management of the environment, alleviation, monitoring, evaluation and reporting on the impacts of the undertaking on the environment throughout the life of the activity is mandatory.[105] The EIA regulations further constitute the illegality of operations that operate without the above requirements.

1.4 Problem Statement

The problem the present study is researching is that there is a negative perception of ASGM in South Africa and a failure to see any link between this sector and livelihood strategies. These views may emanate from a lack of understanding of the role ASGM plays in the livelihood of people engaged in this activity. ASGM in South Africa has become an important activity in attracting many retrenched, unemployed, and poverty-entrenched people in areas where there are deposits to engage in these activities. Formalization of ASGM has remained lethargic despite the DMR recognition of the growth of the sector.

The MPRDA, which is the principal law that regulates mining, criminalizes this sector without addressing how the sector could be integrated and formalized. Currently the sector is crime ridden, and many associated dangerous activities take place. However, many people have been pushed to engage in ASGM as a livelihood strategy due to socioeconomic shocks and trends. To this end, therefore, the research seeks to look at the contribution of ASGM to livelihoods to inform the development of a more facilitative regulatory framework. The absence of research and literature has led to poor insight of the profile and outline of an artisanal miner.[106]

Without an understanding of how ASGM contributes to sustainable livelihoods, the sector finds itself in a quagmire on how it should be regulated. Institutional exclusion and the relegation of the sector can result from the lack of a supporting and appropriate legislative framework. Criminalization of the sector, therefore, leads to banishing the people solely dependent on mining and deteriorates their faith for empowerment, economic emancipation and self-government in livelihood activities meant to alleviate poverty.

Several studies have associated ASGM with negative aspects. The literature, however, does not focus on the contributions the sector can make to enhance livelihoods. Thus, a thorough

[104] Regulation 26 of the Environmental Impact Assessment Regulations 2014.
[105] Ibid.
[106] South African Human Rights Commission (note 58 above) 6.

investigation of the positive contribution ASGM can make will trigger new insights and assist in reframing the sector as a livelihood strategy: Realizing that ASGM is not a problem, but a genuine economic livelihood prospect that should be recognized in the mining regulatory framework. Support for and recognition of this sector poses potential value in resolving socio-economic problems as income is enhanced, revenue to the government coffers is provided as well as foreign currency earnings, and the growth of auxiliary enterprise takes place.

The lack of a framework for the formalization of ASGM has deprived the government and mining communities of the benefits of mineral extraction resulting, instead, in immense pollution, degradation of land, and destruction and loss to property.[107] The absence of supporting and appropriate regulation has led the ASGM sector to contravene other laws such as the Mine Health and Safety Act, 1996 the National Water Act, 1998; and the National Environmental Management Act, 1998 in their endeavor to secure assets for their livelihood. The view of the researcher is that once the contribution of ASGM to livelihoods is better understood, facilitative regulatory provisions can be enacted.

1.5 Research Gap

The literature on ASGM in South Africa has mostly focused on the negative impacts of the sector, negating the role this sector can play in alleviating poverty. The narrative has also downplayed the reasons why people engage in to ASGM. The literature on ASGM in South Africa has found out that the sector is mostly informal, illegal, criminal and a risk to the environment. There is no literature that reframes ASGM in South Africa as a livelihood strategy for the purpose of governance and regulation. This study, therefore, seeks to fill this gap.

1.6 Research Questions

The main research question establishing the scope of the study is: How should the law be reformed to better facilitate ASGM livelihood strategies?

This question is further divided into the following sub-questions:

1. What is the appropriate conceptual framework for understanding ASGM and livelihoods?
2. How is ASGM contributing to the livelihoods of 4 wards in Roodepoort, Gauteng?

[107] Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development (IGF) (note 11 above) 44.

3. How is the law currently facilitating or impeding ASGM as a livelihood strategy?
4. How can the ASGM sector be better regulated to contribute to household livelihoods?

1.7 Purpose Statement

Pursuant to the above-stated problem statement of the study, the purpose of this study is to reframe ASGM as a livelihood strategy for the purpose of governance and regulation. The first purpose was to develop the conceptual framework, then to present the empirical analysis of the findings and submit the legal analysis to reframe ASGM. In addition to a desk-top survey of literature and legislation, a case study methodology was utilized, coupled with semi-structured interviews, prolonged engagements, and observation as tools for gathering data and answering research questions. The approach was useful and enabled multiple insights to the actions and events of the real-life context of the research participants.

The empirical data was collected through in-depth interviews with 10 ASGM respondents from the wards in Roodepoort, namely wards 70, 84, 127, and 128. The wards were purposefully selected. Interviews were designed to investigate the contribution of ASGM to sustainable livelihoods in Roodepoort. From the recorded interviews, themes were identified, and data were systematically coded.

The study also undertook to examine how the law currently facilitates or impedes ASGM as a livelihood strategy. It sought to investigate ways to better regulate the sector to contribute to household livelihoods more generally.

1.8 Rationale of the Study

The study has both academic and policy relevance. ASGM is becoming a huge problem in Gauteng and in the Roodepoort area. The area lies along the Witwatersrand Gold Basin and has several derelict mines in and around compared to other areas in the province and country. There is a need to discern and discover new ways of doing things as the challenges have persisted and grown exponentially. The findings of the study will bring different understandings on ASGM and first-hand information which will shed light on the potential of ASGM to alleviate poverty and enhance empowerment of the local community.

The rationale of this research is informed by the study conducted by Varma and Hodge[108] that ASGM is a livelihood strategy being practiced in most developing countries to reduce poverty, enhance food security and improve wellbeing. The findings of this research will highlight several factors that inhibit the sector from meaningfully contributing to livelihoods. The researcher considers that the findings of the study will shed light on how the sector plays a fundamental role to sustainable livelihoods which in turn could be a step towards an enactment of suitable and appropriate ASGM regulatory framework thereby creating zones of governability.

The thesis will contribute to new knowledge on the utilization of social, physical, natural, financial and human capital by the artisanal miners in order to acquire mineral resources.

The results of the study will also be useful to DMR and its stakeholders since the findings will present first-hand and empirical evidence of the nature and characterization of ASGM. The study can facilitate new understanding and appreciation of the positive contributions the ASGM sector makes and dismiss negative narratives that artisanal gold mining's contribution to sustainable development is only negative.

1.9 Limitations of the study

I started off with a social science background and had to familiarize myself with legal concepts as my bursary was with the School of Law. At the start of my studies, to deepen my understanding of and engagement with South Africa law, I successfully completed the Introduction to Law for Non-Lawyers course offered by the Mandela Institute

The sample size was small for the empirical component of the research was small. Qualitative methods were used to explore and solicit detailed information from the respondents. Having a larger sample would have enabled large sums of data for more insights regarding ASGM as an activity. Precarious conditions such as turf wars and imminent arrest limited the study.

Given the perceived negative narrative about the nature of ASGM in South Africa, the researcher was sometimes forced to end the interview prematurely due to suspicion of imminent police raids. At times artisanal miners were reluctant to participate due to supposed bias that they are criminal, illegal immigrants and environment polluters. However, despite the

[108] S Varma & A Hodge 'Working Together. How Large-scale mining can engage with artisanal and small-scale miners' (International Finance Corporation New York 2010).

disruptions, the researcher managed to make repeated visits to get clarifications on several relevant questions and observations.

1.10 Organization of the Study

The research has been divided into seven chapters, presented as follows:

Chapter One, which is the opening chapter, covers the background to the study, the problem statement, research objectives and questions as well as the justification for the study. It also covers the limitations and the organization of the study.

Chapter Two provides the main conceptual frames for the research, focusing on ASM/ASGM as an activity, livelihoods and formalization of livelihoods.

Chapter Three then details the empirical strategy used to collect and analyze data and present the results.

Chapter Four presents the results of the empirical component of the study, which focused on the profile of ASGM miners in four wards of Roodepoort.

Chapter Five presents the legal analysis of livelihood assets and the scope of the legal formalization challenge.

Chapter Six analyses the empirical and legal findings in light of the conceptual frame, with a view to understanding how ASGM could be better regulated to contribute to household livelihoods.

Chapter Seven focuses on the recommendations and conclusion.

1.11 Summary of Chapter 1

Chapter 1 has presented the introduction, the research problem, the research questions, and the research objectives to ground the study. Moreover, the chapter has discussed the preliminary literature and review of known characteristics and different forms of illegality. The chapter has

identified legal provisions that are against illegality of ASGM. The significance of the study has also been discussed in this chapter. The next chapter will focus on the literature review and the theoretical framework of sustainable livelihood framework based on the articulation of the relationship between characterization of ASGM, and as a livelihood, and how it could be formalized.

Chapter 2

A Conceptual Framework for Reframing ASGM: Characterization, Livelihoods and Formalization

This chapter provides the literature review for the study. It is organized according to three broad themes, namely the dominant characterizations of ASM, ASM as a livelihood strategy and the formalization of ASM. The purpose of this chapter is to place the study within the context of existing literature, establish the relationships with other studies and explain why the research is necessary. The study identifies gaps in other studies in so far as the characterization of ASGM, ASGM as a livelihood activity and how it can be formalized is concerned. This literature review chapter provides the conceptual frame for the empirical and legal components of the study in later chapters

2.1 Characterization of ASM

2.1.1 Scholarly and legal definitions of ASM

The first part of the literature review focuses on the dominant characterization of ASM, drawing on scholarly, advocacy and legal sources. This characterization includes a focus on the negative environmental and socioeconomic externalities of ASM, drawing on the theory of the tragedy of the commons. The discussion below shows that the meaning given to ASM is multi-dimensional and country specific. Nevertheless, it is imperative to develop and establish a core understanding of ASM and ASGM in the South African context. A general appreciation and understanding of ASM is important to assist policymakers and other key stakeholders come up with interventions that manage the challenges and opportunities that artisanal mining presents.

In scholarly and advocacy literature, there are very different definitions of ASM. The Minerals, Mining and Sustainable, Development Report Breaking New Ground characterized ASM as activities that “exploit marginal or small deposits, lack capital, are labor intensive, have poor access to markets and support services, low standards of health and safety and a significant

impact on the environment."[109] Hentschel, Hruschka and Priester add that ASM is "mining by individuals, groups, families or cooperatives with minimal or no mechanization, often in the informal (illegal) sector of the market."[110] Hinton *et al* highlight the survivalist, and subsistence character of ASM in these accounts (ASM as an undertaking ordinarily conducted on a subsistence basis by individuals or small groups with simple tools).[111] Goreux highlights poverty: ASM is mainly "a poverty driven activity, typically practiced in the poorest and most remote areas of a country by a largely itinerant, poorly educated populace with little other employment alternatives".[112] Dreschler's 2001 definition captures most of the themes of what seems to be the dominant scholarly discourse on ASM (informality, poverty, subsistence, labor intensity, low levels of capital investment, and detrimental social, health and environmental impacts):

> ASM mining operations are unregulated; they range from activities conducted by individuals to junior operations; the majority of activities are poverty-driven, with a few business orientated; they can be permanent or seasonal in nature; they are technologically backwards using very little, if any, mechanisation; the sub-sector is informal and carried out illegally; it is mainly unauthorized and undercapitalized; and it is known for the low standards of health, safety and environment.[113]

These themes are echoed but also expanded upon in legal definitions of ASM from the mining laws of many jurisdictions where ASM takes place, including South Africa. As the table and discussion below shows, the most common factors used to define ASM include, capital investment levels, type of mineral, level of technology, level of production, and the size and depth of mining. A contrast between scholarly and legal definitions indicates that scholarly definitions refer more frequently to poverty, informality or survival and subsistence while legal definitions highlight the mining method, level of investment, area, depth, and duration.

[109] Mining and Sustainable Development Project 'Breaking new ground: mining, minerals, and sustainable development: the report of the MMSD project' (IIED London 2002) 348.
[110] T Hentschel, F Hruschka & M Priester 'Artisanal and small-scale mining: challenges and opportunities' (International Institute for Environment and Development (IIED) London 2003) 18.
[111] J Hinton and M R Hollestelle 'Artisanal and Small-scale Mining in and around protected areas and critical Ecosystems Project. Methodological toolkit for baseline assessment and response strategies to artisanal and small-scale mining in protected areas and critical ecosystems' (World Wide Fund (WWF) 2012) 5.
[112] L Goreux 'Conflict Diamonds' (*Africa Region Working Paper Series Number 13* 2001 World Bank) 10.
[113] Ledwaba & Nhlengetwa (note 17 above) 28.

Subsistence and poverty are almost never mentioned. Both scholarly and legal definitions suggest that ASM is a less sophisticated livelihood.

Table 2.1 ASM definitions by country

Country	Criteria	Main Remarks
Algeria	The Algeria Mining Code makes provision for an artisanal license, which is given out for mining exploitation for a period of 5 years.[114]	Mechanization; operation depth; nationality; mining duration.
Burkina Faso	Article 5 of the Burkina Faso Mining Code states that artisanal mining includes "all of the operations which consist in extracting and concentrating mineral substances such as gold, diamonds and other gems, coming from primary and secondary outcrops or outcropping and recovering the products merchants using manual and traditional methods and procedures".[115] Use of mercury, cyanide and child labor is prohibited. The artisanal mining license holder is mandated come into an agreement with landowners. They must pay for damages the landowner if cultivated fields and other infrastructure is destroyed.	Nationality; size of the area, landowner's consent.
Chad	The law defines artisanal mining as "exploitation using manual or traditional methods and procedures or both at the same time, and which is not based on the prior identification of a deposit or a deposit".[116] The term artisanal and small-scale mining is used interchangeably. Therefore, the license issued is binding for both. The law limit and restrict ASM to the method of mining that is (alluvial).	Nationality; alluvial mining; mechanization; restricted to alluvial mining
Colombia	The Colombian Mining law 1382 "limits the size of ASM concessions to 150 hectares for individuals and 500 hectares for groups or associations of traditional miners, and only one concession each".[117] ASM	Nationality; reserved areas; mining area; mechanization.

[114] Article 108 Algeria Mining Code 2014.
[115] Article 5 Burkina Faso Mining Code 2015.
[116] Chad Mining Code 2018.
[117] Colombia Mining Law 1382 and Decree 933 of 2013.

	activities are undertaken by communities on demarcated land as a livelihood. The law limits ASM activities to the aerial extent determined by the mining concession agreement.	
Cote D'Ivoire	Cote D'Ivoire Mining Code 2014 defines artisanal mining as undertakings of which the extraction and concentration of mineral substances and the recovery of marketable products using manual and traditional methods and does not use chemicals or explosives.[118]	Mechanization; concession size; depth; permanent or non-permanent operation; nationality.
Democratic Republic of Congo (DRC)	Artisanal Mining (AM) is a level of mining undertaken by citizens in a specific area designated for AM. AM Exploration Card is issued to permit for artisanal mining activities to be undertaken.[119] AM is permitted on an aerial extent determined by the Provincial Head of Mining, for a period of not more than a year and at a depth of up to 30 meters.	Mechanization; concession size; depth; permanent or non-permanent operation; nationality.
Ecuador	The mining law defines artisanal mining as "mining activities carried out by an individual, a family or an association characterized by the use of hand tools and simple and portable machines to obtain minerals, the sale of which covers only the basic needs of the person or family involved and does not require an investment of more than 150 basic unified salaries (US $39,600)".[120] Permit holders are allowed to possess one permit for the duration of 10 years for a determined location renewable for equal periods.	Capitalization; nationality; environment management plan; duration and mechanization.
Ethiopia	Mining Operations Proclamation No.816/2013 indicates that the artisanal mining is manual in nature, with an anticipated annual production and does not involve the engagement of employed workers.[121] Artisanal mining in Ethiopia is considered as a subsistent activity.	Citizen of Ethiopia; level of mechanization and output production; run individuals or cooperatives.

[118] Article 68 Cote D'Ivoire Mining Code 138 of 2014.
[119] DRC Mining Code 2018.
[120] Mining Law Ecuador of 2009.
[121] Ethiopia Mining Operations Proclamation No.816/2013.

Ghana	License in Small-scale Mining (SSM) is upon submission by Ghanaians of a capital investment of not less than USD 100 000 including an indication of the number of participants.[122] The license covers all ASM activities and license holders can mine any area licensed for a period not more than 5 years. SSM undertakings are permissible on an aerial extent of 21 hectares. The license can be transferable and leased. The activity is linked to citizenship, investment, and the number of participants, area, and time.	Nationality; capital investment and number of workers; no separate artisanal mining licence; SSM licence grants exclusive right to the holder.
Guinea	The Guinea Mining Code defines the artisanal operations as, 'means an activity which consists of small-scale operation using traditional or non-mechanized methods'.[123] Artisanal operations refer to the precious metals such as gold and diamonds. Artisanal operations are permissible for persons with Guinean nationality. Artisanal operation permit limits the depth to 30 meters and 15 meters in cases of operation by lifters and digging respectively.[124] Areas reserved and the perimeter thereof for artisanal operations are designated by the Minister responsible.	Nationality; area; operation's depth; mechanization.
Kenya	The Mining Act No 12 of 2016 defines AM as meaning, "traditional and customary mining operations using traditional or customary ways".[125] The Act defines four permits for the ASM sector to determine duration, area or size, level of mechanization and investment. These four permits are "artisanal mining, small-scale reconnaissance, small-scale prospecting and small-scale mining."	Nationality; size of the area, landowner's consent; environment management plan.
Mali	The artisanal mining license is issued to Malian citizens based on capital investment; mechanization and depth of mining.[126]	Nationality; operation's depth; mechanization.

[122] Minerals and Mining Act 703 of 2006, S82 (1).
[123] Guinea Mining Code of 2006.
[124] Article 93 of Guinea Mining Code of 2006.
[125] Kenya Mining Act No 12 of 2016.
[126] Mali Mining Code of 2012.

Philippines	Artisanal mining is based on the type of mineral mined. For example, guano extraction permit is issued for 5 hectares 1 year renewable and gemstone gold panning and sluicing permit 0.2 hectares 3 months renewable permit.[127] The definition is like Guinea, but different on the duration of a mining permit.	Nationality; size; duration; operation's depth; environment management plan; mechanization.
Rwanda	The small-scale mining license makes provision for ASM activities, though it does not make mention of the term ASM. ASM operations can be undertaken in any area where licensed within 50 hectares, for a duration not more than 15 years. The mining license is not restricted to nationals and the holder can relinquish part of the mining area.[128]	Size (<49ha), Nationality, level of mechanization, landowner compensation; distinguish AM from SSM.
Senegal	Article 39 of the Senegal Mining Code of 2003 states that, the permission for the artisanal activities of extracting minerals using manual and traditional methods is within an aerial extent of 5 square kilometers and a depth of 15 meters.[129]	Mechanization level, depth 15 m, only in designated areas.
Sierra Leone	Mines and Minerals Act, 2008 restricts artisanal mining to nationals only. AM licenses are dispensed for areas only particularly allocated AM areas for a period on 1 year renewable 3 times on an aerial space of 0.5 hectares and on a depth of 10m.[130]	Nationality; operation's depth; mechanization.
South Africa	The mining permit makes provision for ASM activities, though it does not make mention of the term ASM. ASM operations can be undertaken in any area where licensed within 5 hectares, for a duration of 2 years renewable 3 times. The mining permit is not restricted to nationals but cannot be transferred or leased.	Optimum operations on a restricted mining size; duration, not restricted to citizens, not transferable.
Tanzania	Small-scale Mining is defined indirectly in the Mining Act of 2010, as the type of operation, whose capital investment, including labor and technology is less than USD 100 000 worth of investment therefore, one is entitled to acquire a Primary	Capital investment; number of workers, technology requirements; designated Primary License Areas (exclusively reserved for prospecting and

[127] Philippines Mining Act of 1995.
[128] Rwanda (2018) Law No N° 58/2018 of 13/08/2018 on Mining and Quarry Operations.
[129] Mines and Mineral Development 11 of 2015, S 29(3).
[130] Sierra Leone Mines and Minerals Act of 2008.

	Mining License (PML).[131] PML is for a period of 7 years, renewable for 3 times. It also covers all ASM activities.	mining operations under PML)
Uganda	The Mining Act (2003) defines one license for ASM activities by a Ugandan citizen with no use of specialized technology and expenditure more than USD 3,000. The license is for a period of 2 years can be upgraded and transferred.[132] License holders have the right to prospecting, mine and trade. The mining area depends on the type of the deposits for example, mining area for precious stones is 500mx300m	Capital investment; nationality; mechanization; small-scale prospecting and mining operations shall apply for a location licence
Zambia	Mines and Mineral Development 11 of 2015, S 29 (3) defines artisanal mining based on the 'area of land (size of the concession) over which an application for a license is lodged will be a minimum of one cadaster unit'.[133] It is also based on technical and financial capacity.	Nationality; concession size; technical and financial capacity; proper provision for environmental protection.

The most common ways of characterizing ASM within the legal perspective appears to be in terms of requirements, such as the mining method, level of investment, area, depth and duration. The legal source further characterizes ASM according to rights, responsibilities and obligations. Characterizing ASM by citizenship is also common in countries like Ghana, Uganda and Mali. In these countries ASM activities are reserved for citizens. In South Africa, as noted in Chapter 1, the perception is that ASM, and ASGM, is largely conducted by foreign migrants.

Most ASM activities are not allowed to operate with high capital investment and mechanization. Countries that have adopted the concept of limited capital investment include, Uganda (USD 3,000) and Ecuador (USD 39,600). In Ghana the use of mechanized equipment is restricted. Most countries such as Ecuador, Colombia and Chad characterize ASM as an activity that uses traditional methods. However, the use of traditional and or manual tools might limit production levels and hinder development.

[131] Tanzania Mining Act of 2010.
[132] Uganda Mining Act of 2003.
[133] Section 29 (3) Zambia Mines and Mineral Development 11 of 2015.

The DRC and Tanzania have established zones for ASM exploitation and exploration. Relevant district or provincial mining offices must demarcate areas of artisanal operations.[134] Countries such as Sierra Leone, Senegal, Rwanda and Colombia have characterized ASM based on the size of the mining area. Amongst these countries, Sierra Leone has the smallest size of 0,5 hectares, while Colombia limits the individual concession to 150 hectares. Several benefits are associated with this categorization in so far as job creation for locals and development of local businesses is concerned.[135] For that reason, aerial size grants miners the ability to estimate the amount of investment needed such as infrastructure and labor.

The zoning approach used in the DRC and Tanzania takes away the need for protocol and other prerequisites upon lodging an application. In most cases the responsible authority issues or makes a specific pronouncement to accommodate particular sections and groups of people within a particular community. In some countries, for example, Papau New Guinea, landowners have allowed artisanal miners to mine gold without the requisite license on condition that they extract gold using traditional and manual methods.[136] The principle of free digging is becoming a feasible practice. Some countries such as Zambia, Uganda and the Philippines have embraced it by legalizing the mining of minerals by landowners or any lawful occupier.[137]

This demarcation system goes on to offer certain mining rights in so far as the extent of depth that the miners engaged in the extraction of minerals is concerned. Some countries such as Ethiopia, Indonesia and Papua New Guinea have adopted this model. Therefore, the vertical extent or depth set by Ethiopia, for instance, is 15 meters and 50 meters by the Philippines.

There are extremes in the legal definitions in so far as time is concerned. The Philippines has the shortest time of 3 months and Tanzania provides the longest time for an ASM license, amounting to 7 years. The sector in most countries is allowed to operate for a period between 1 to 5 years on average. This shows, that though there might be consensus on certain key themes in ASM, there is no consensus on the specifics of characterizing the activity.

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[134] DRC Mining Code 2002.
[135] E Bugnosen 'Small-scale Mining Legislation: A General Review and an Attempt to Apply Lessons Learned' in Hilson, G. M (ed.) The *Social Economic Impacts of Artisanal and Small-scale Mining in Developing Countries* (2003).
[136] Ibid.
[137] Ibid.

Several mining laws distinguish between artisanal mining and small-scale mining. Countries such as Sierra Leone, the DRC, Guinea and Mali have a separate artisanal license category. One understands that this distinction allows different levels and needs of mining to be appropriately regulated. Countries such as Ghana, Tanzania and South Africa (mining permit), have one license category for the whole range of operations, from artisanal to small-scale mining. For example, the MPRDA does not clearly state that a mining permit is for small-scale mining. However, an assumption has been created that mining permit is for SSM, as the requirements for obtaining a mining permit (including an environmental authorization) are onerous.

In the scholarly literature, there are wide-ranging positions concerning the actors, technologies and practices and established–capital provisions that distinguish SSM from ASM. Veiga practically differentiates three broad groups in ASGM: "a) micro-scale, informal, artisanal; b) small-scale, illegal, semi-mechanized; and c) medium-scale, illegal, mechanized".[138]Barney pointed out that;

> "globally, the micro artisanal part of ASGM encompasses comparatively independent miners working marginally productive gold tracts, experiencing high levels of vulnerability and holding subordinate livelihood positions, but who also find support through non-market access to gold and other market or subsistence-based ecological resources".[139]

Some countries license particular minerals separately. These minerals are often regarded as strategic minerals and they include diamonds, gold and other gemstones. These are commonly targeted by artisanal and small-scale miners. In Guinea, the Philippines and Mongolia, ASM licenses are issued within a specific set of mineral categories such as metallic and non-metallic mineral resources.

The informality and illegality of ASM are highlighted in the scholarly definitions, but only implicit in the legal definitions. ASM is formal when the needs of actors in the sector are fully

[138] M Veiga 'Artisanal mining: perspectives from the field. The intergovernmental forum on mining, minerals, metals and sustainable development' (2014) 3.
[139] K Barney 'Reassembling informal gold-mining for development and sustainability? Opportunities and limits to formalisation in India, Indonesia and Laos' 2018 *Between the plough and the pick: Informal mining in the contemporary world* 335.

catered for. Formalization entails that the activity is legal, viable, safe and environmentally responsible.[140] If the activity is informal within a legal context, where the regulatory framework is supportive such as in the DRC and Sierra Leone, a transition from informal to formality is possible. Sustainable livelihoods are then achieved and enhanced through supportive structures such as access to markets, financial support, and education and training, especially in environmental management, health and safety. None of the legal definitions highlight the lack of these features as characteristic of ASM. Illegal ASM operates outside of the law, informally and in some instances criminally.

As highlighted in Chapter 1, within the South African context, ASM is conducted mostly under precarious conditions in disused mines. Ledwaba & Mutemeri comment on informal ASM as "illegal, but [that it] is tolerated because of legitimacy inferred by socioeconomic and political imperatives".[141] This can be evident on local or traditional authorities that have custodianship or ownership have permitted the activity to be undertaken as a livelihood strategy. Figure 2.1 below illustrates the relationship between types of ASM based on legal status**.**

[140] N Mutemeri, J Z Walker, N Coulson & I Watson 'Capacity building for self- regulation of the Artisanal and Small-Scale Mining (ASM) sector: A policy paradigm shift aligned with development outcomes and a pro-poor approach' (2016) 3 *Extractive Industries and Society* 653.
[141] P Ledwaba & N Mutemeri 'Preliminary study on artisanal and small-scale mining in South Africa' (Report prepared for Open Society Foundation for South Africa (OFS-SA) by the Centre for Sustainability in Mining and Industry (CSMI) 2017) 18.

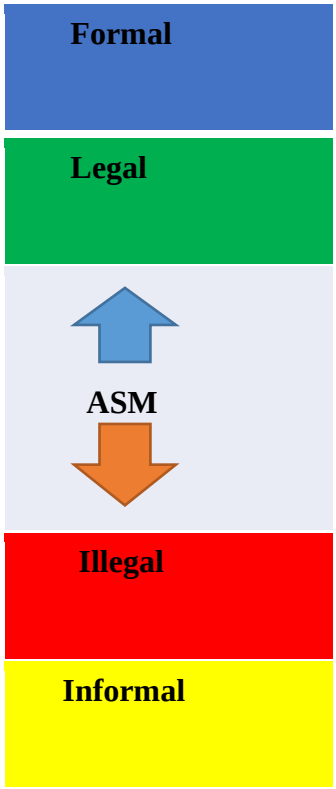


Figure 2.1 Different types of ASM based on legal status

The categories of formal/informal and legal/illegal can be used as the basis for a typology of ASM:

- Formal/legal: In some jurisdictions, ASM is both formal (access to markets, financial support, education and training, payment of taxes, responsible environmental and health and safety conduct) and legal (in compliance with a specific regulatory framework). This, for example, is the case in Tanzania.
- Informal/illegal: South Africa is an example where most ASM activity is both informal and illegal; that is not supported, conducted outside of the law and criminalized. Several negative externalities often accompany this category because miners do not have an incentive and commitment to be socially, economically and environmentally accountable and responsible.
- Informal/legal: In certain countries such as Ecuador, Ghana and Peru, the practice is legally recognized "*de jure*" and the mining activities are conducted even though they are not recognized by the law, "de *facto*". This is all associated with the inability to put into effect the lawful and formal requirements.

- Formal/illegal: In certain jurisdictions, ASM may receive some formal support (possibly through traditional structures) and yet operate outside a formal regulatory frame such as in Ghana and the Philippines.

The overwhelming categorization of ASM that emerges from the scholarly literature is that it is an informal, illegal economic activity. The characterization of ASM as illegal sticks because mining activities violate the requirements of the mining permit, occupational, health and safety duties and other mining related laws. However, the illegality of ASM may be exacerbated by inadequate legal provisions, but also by intentional illegal and criminal conduct by those undertaking the work.[142]

2.1.2 Negative Externalities of ASM

The characterization of ASM can be further enriched by elaborating on the negative externalities associated with the sector. A typology of these externalities is presented in table 2.2.

Table 2.2 Negative Externalities of ASM

Environmental	Safety and health	Social	Economic
Pollution of water sources	Spread of diseases	Substance abuse	Corruption
Land degradation	Lack of protective clothing	Child labor	Mineral-rush effect
Mercury and cyanide pollution	Poor lighting	Prostitution	Lack of planning
Soil erosion	Exposure to dust and toxic gases	Conflicts (turf wars)	Lack of education
Dust pollution	Unsafe working tools	Destruction of cultural values and sites	Money laundering
Waste, including faecal matter	Poorly supported working conditions	Gender discrimination	Hindrance to economic growth

Source Zvarivadza 2018[143]

First, ASM triggers a variety of environment-related impacts. Gunson & Jian argue that mined land is changed, reducing its utility for other purposes such as farming.[144] There is a great deal of landscape destruction resulting from the operation of artisanal mining as the pits that are left

[142] Artisanal Mining Report 'Legal Resource Centre' (Johannesburg 2016).
[143] T Zvarivadza 'Artisanal and small-scale mining as a challenge and possible contributor to sustainable development' (2018) 56 *Resources Policy* 2.
[144] A J Gunson & Y Jian 'Artisanal mining in the People's Republic of China' International Institute of Environment and Development, Draft Report (London 2001) 10.

open often turn into death traps to both humans and animals, particularly when they are filled with water. It is also believed that they also serve as breeding grounds for mosquitoes.[145]Artisanal mining operations are viewed as "activities that disrupt the hydrological cycle and may also disturb the water-table, geological stability and surrounding environments". Lombe argues that "activities such as gold panning along rivers may alter riverbeds and cause siltation which would affect the river flow".[146] For example, "gold panning which occurs on the riverbeds of the Zambezi River in Southern Africa causes heavy siltation, making the river shallower and shallower each year. Furthermore, heavy metals and chemicals like mercury and cyanide also end up in water bodies causing serious damage to both aquatic life forms and humans".[147] Therefore, "environmental degradation is the most noticeable of the negative impacts linked with artisanal mining". It may also be very difficult to manage environmental impacts given that the practice is mostly elusive and illegal.

Sociocultural disturbances are also the effects of ASM. A number of problems arise as a result of the discovery of mineral deposits. For instance, one might submit that the migration related to ASM takes along people from diverse sociocultural backgrounds and with different sets of cultural beliefs and norms together. With a reputation for generating wealth quickly, ASM also attracts unlawful and immoral activities "like money laundering, substance abuse, theft and prostitution".[148] According to Gyan-Baffour, social ills emanates "because of breakdown in law and order in most of these mining areas those who have some savings tend to spend a lot of their savings on alcohol, prostitution, and gambling at the expense of productive investment".[149] For this reason, "high rates of prostitution, crime and sexually transmitted diseases like HIV/AIDS in mining communities have been reported".[150] The decay in sociocultural values as well as the increase in criminality in mining areas requires a clear policy guideline and administration of artisanal mining activities to avert the serious negative consequences that may result.

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[145] B N A Aryee, B K Ntibery & A Evans 'Trends in the small-scale mining of precious minerals in Ghana: a perspective on its environmental impact' (2003)11 *Journal of Cleaner production* 133.
[146] W C. Lombe 'Small Scale Mining and the Environment: Bloom beyond the doom and gloom?' (2003) 2 *Journal of Cleaner Production* 96.
[147] Ibid 96.
[148] B Dreschler 'Small-scale Mining and Sustainable Development within the SADC Region. MMSD Report' (IIED and WBCSD London 2001) 123.
[149] G Gyan-Baffour 'Artisanal Mining and Poverty. Communities and Small Scale Mining (CASM) 3rd AGM and Learning Event' (Ghana 2003), last accessed from
http://www. casmsite. Org/Documents/Elmina on 13 April 2020 4.
[150] Fisher (note 27 above) 210.

Third, the status of "occupational health and safety (OHS) in artisanal mining is deplorable". IGF states that, "most OHS risks in sub- Saharan Africa (SSA) are borne by women, due to the division of tasks between male and female miners".[151] "Mine accidents range from rock falls, mine cave-ins to flooding, while health hazards include mercury poisoning and silicosis".[152] In a study conducted in Tanzania by the World Bank, it was found that out of 46 children, 22 had a higher mercury intake levels from the breast milk of mothers residing at ASGM sites[153] Accidents arise from absence of knowledge about mining, poor education and ignorance of risks and dangers. ASM miners also "lack guidance on the usage and handling of explosives and deadly chemicals like mercury and cyanide".[154] As a result, "they tend to misuse the chemicals and explosives, thereby exposing themselves and their communities to many hazards". Another major hazard on ASGM sites is poor sanitation. Furthermore, the transitory nature of artisanal mining discourages them from building sanitation facilities and for this reason contagious waterborne illnesses like bilharzia and diarrhoea are widespread in ASM mining areas.[155]

OHS is not given much priority in artisanal mining. "Unless operators have formerly worked in large mining companies, artisanal miners are ignorant of the risks associated with mining".[156] Thus, they do not take safety measures like wearing helmets and safety shoes. In addition, "the conditions in which they work are appalling, exacerbating the potential for accidents and disease outbreaks". Furthermore, labor standards are also poor. Yakovleva argues "that working conditions, especially wages, are not standardized". She cites the example of "women who are generally paid less than their male colleagues".[157] Although, women are not involved in heavy duties like digging[158] their wages are not equal to the amount of work they do.

[151] Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development (IGF) (note 10 above) 22.
[152] Hentschel et al. (note 3 above) 63.
[153] World Bank 'Africa Socioeconomic Impact of Mining on Local Communities in Africa Report' (World Bank Group 2015) 7.
[154] T Hentschel, F Hruschka & M Priester "Global report on artisanal and small-scale mining Report commissioned by the Mining, Minerals and Sustainable Development of the International Institute for Environment and Development" (IIED and WBCSD London 2002) 37.
[155] Fisher (note 27 above) 210.
[156] Ground Breaking New 'The Report of the MMSD Project' Earthscan Publication Ltd London 2002) 236.
[157] N Yakovleva 'Perspectives on female participation in artisanal and small-scale mining: A case study of Birim North District of Ghana' (2007) 32 *Resources Policy* 29-41 36.
[158] Yakovleva (note 157 above) 34.

However, because of high levels of poverty, numerous people are forced to work in these hazardous conditions for very minimal incomes just for their survival.

The use of hazardous substances such as "mercury puts the health of miners and their communities at risk". Artisanal miners and communities in general are exposed, to mercury, zinc vapor, cyanide, or other acids.[159] This is a particular concern in gold mining, where mercury is frequently deployed and cyanide use is growing. "Mercury can be inhaled, swallowed or absorbed through the skin, but the health consequences are usually not immediate".[160] "Inhaling dust and fine particles from blasting and drilling processes can cause respiratory diseases such as silicosis or pneumoconiosis in men and women, and in the children who often accompany their parents".[161] The Minamata Convention on Mercury use, a legally binding instrument, was initiated in 2013 by the United Nations Environment to reduce trade, supply and use of mercury and to promote mercury free technologies in ASGM.[162] The convention identified that ASM as one of the largest anthropogenic sources of mercury pollution, with some 1400 tonnes emitted per year.[163] According to the United Nations Environment 2017, 51 countries have ratified and 120 have shown interest in signing the Convention.[164] Practical efforts to control and reduce the use of mercury include the establishment of National Action Plans in all countries where ASGM is undertaken. However, Spiegel criticizes the Minamata Convention in that it fails to consider the socioeconomic context of mining sites where power relations of different stakeholders influence the trade and use of mercury.[165]

Regardless of many countries in the world, having endorsed International Labor Organization (ILO) Convention 182, abolishing the Worst Forms of Child Labor,[166] child labor seems to be the norm in many SSA countries where artisanal mining takes place. A huge number of children

[159] S Obiri et al. 'Evaluation of lead and mercury neurotoxic health risk by resident children in the Obuasi municipality, Ghana' (2010) 29 *Environmental Toxicology and Pharmacology* 210.
[160] A Frederick Ato, et al 'Working conditions of male and female artisanal and small-scale goldminers in Ghana: Examining existing disparities' (2016) 3. *The Extractive Industries and Society* 464-474.
[161] Ibid.
[162] Minamata Convention on Mercury, 2013.
[163] Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development (IGF) (note 10 above) 23.
[164] UN Environment 'Artisanal and small-scale gold mining' (2017) 27.
[165] S Spiegel et al. 'Phasing out mercury? Ecological economics and Indonesia's small-scale gold mining sector (2018) 144 *Ecological Economics* 2.
[166] Hentschel et al (note 154 above) 23.

are involved in ASGM in SSA as in other developing countries.[167]Although the exact number of children involved is not known, it is estimated that more than two million children worldwide are directly and indirectly involved in mining.[168] The poverty associated with artisanal mining means that for families, every member of the family, including children must participate for survival. It has been observed that every member of the family has a role the artisanal mining family.[169] Lack of money to send children to school as well as the dearth of nearby schools are some of the claims that parents put forward to explain the involvement of children in mining.[170] On the other hand, one can claim that the involvement of minors in artisanal mining places them in unsafe working environments and leads to abandonment of their education.

The Global Report on Artisanal and Small-Scale Mining held that children as young as three were being used in ASM.[171] The participation of minors in ASM exposes them to severe and hazardous working conditions and creates risks to their health.[172] Moreover, children might be deprived of their right to education, thus denying them a future, with no job of employment choices other than following the ways of their forefathers before them in artisanal mining. As a result, formalizing artisanal mining would enable an environment which allows for better living and working conditions comprising decent wages, and eradicating improper work practices. Therefore, miners will be obligated to observe and regard highly the ideals of OHS, which would also safeguard that just and fair working conditions are put in place, and that child labor is eliminated.

Economic negative externalities associated with ASM can be disastrous for the individuals and the community at large since the activity is mostly informal and illegal. Hence, Zvarivadza states that the sector is difficult to regulate and to implement approaches to manage socioeconomic challenges.[173] Irresponsible exploitation of minerals might also inevitably result in economic disaster such as corruption, tragedy of the commons, short-sighted planning, and

[167] M Bodenheimer 'Certifying improvement, improving certification: An analysis based on the artisanal and small-scale mining sector' (Working Paper Sustainability and Innovation, 2014).
[168] International Labor Organization (ILO) 'Action Against Child Labor and Quarrying: A Thematic Evaluation. International Labor Organization' (ILO Geneva 2004) 14.
[169] Alice Lungu *Formalisation of artisanal and small-scale mining in Sub-Saharan Africa: challenges and ways forward*. (Unpublished thesis, Environment and Development, The Faculty of Humanities, University of Manchester, 2007) 26.
[170] Hentschel et al (note 154 above) 24.
[171] Ibid.
[172] International Labor Organization (note 58 above) 15.
[173] Zvarivadza (note 32 above) 3.

lack of collateral security.[174] Thus, the economic implications of ASM can result also in localized inflation, destruction of infrastructure, exploitation of labor, discrimination, failure to adapt to technology as well as xenophobia due to the increased in-migration of people. However, ASM can play an important role in economic growth if governments can absorb this sector as a main activity.[175]

2.1.3 The Tragedy of the Commons Theory

A theory that is commonly applied to these kinds of negative environmental, social and economic problems outlined above is the tragedy of the commons, popularized by Garrett Hardin in his seminal 1968 essay on "The Tragedy of the Commons."[176] The commons is a "natural resource shared by many individuals".[177] Governance tools to address the tragedy of the commons are relevant to a discussion of the formalization of ASM, and will also be considered in section 2.3 below. In this section, I briefly discuss how the tragedy of the commons applies to the negative externalities of ASM.

In "The Tragedy of the Commons", Hardin pronounced on the fate of a common pasture that was unowned and accessible to all. Adler points out that in such situations, "it is each herder's self-regard to maximize his use of the commons at the expense of the community at large".[178] Supposing logical self-centered pastoralists, Hardin ends by saying that each herder would add as many animals as possible to his herd, with the unavoidable result of overgrazing and the devastation of the common pasture.[179] However, the costs of overgrazing the pasture are spread and shared amongst every user of the pasture. As soon as all the herders respond to these incentives, the pasture is over-grazed and destroyed, hence the tragedy.

Elinor Ostrom tackled the governance of common pool resources in her work *Governing the Commons*. She realized that the governance of common pool resources must overcome two obstacles, namely, excludability which entails that it is hard to exclude others using or depleting

[174] Buxton (note 56 above) 15.
[175] Zvarivadza (note 32 above) 10.
[176] G Hardin 'The Tragedy of the Commons' (1968) 162 *Science* 1243-1248.
[177] Ibid.
[178] J H Adler 'Property Rights and the Tragedy of the Commons' *The Atlantic* 22 May 2012, last accessed from https://www.theatlantic.com/business/archive/2012/05/property-rights-and-the-tragedy-of-the-commons/257549/ on 14 April 2020 at 4.
[179] Hardin (note 176 above) 1248.

the same resource; and subtractability, the tendency for one person's use to subtract from the value of the common pool resource.[180]

ASGM involves the extraction of common pool resources: The environmental resources used include land, water and air and the gold that is in the ground that has been rendered a common pool resource by previous formal mining.[181] ASGM may or may not take place under a regulatory framework. If the undertaking is illegal, or if regulations are weakly enforced, the resource is open access and almost any person can dig up the gold. Isaza *et al* point out that when the action is lawful, "the mere fact that a miner holds a license to exploit the resource does not necessarily imply a complete exclusion of other potential miners".[182] However, a common pool resource in ASGM is normally dependent on some kind of social prearrangement amongst operators, in this case between legitimate miners and illegitimate miners as well as between unlawful miners and local leadership.[183]

Hardin submitted that greater dependence on property rights could avert the tragedy of the commons.[184] As Adler explains, "where property rights are well-defined and secure, the tragedy of the commons is less likely, since each owner has ample incentive to act as a steward".[185] Owners want to preserve essential resources and prevent overuse, both for themselves and others who value the underlying resources. Adler argues that what Hardin labelled the "common" is more appropriately termed as an open-access commons. He points out that, "there are some resources that are owned or managed in common that do not suffer the tragedy of the commons as a result of community management of some form or another".[186] "Multiple rights regimes may also be present in the same object,[187] for example where the state owned the private property rights to land, then gave demarcated parcels of land to different

[180] E Ostrom 'Governing the Commons: The Evolution of Institution for Collective Action' (1992) 32 *Natural Resources Journal* 416.
[181] C A Saldarriaga-Isaza *The Tragedy of the Commons in Artisanal Gold Mining. Evaluation of Mechanisms of Cooperation with Simulation and Economic Experiments* (Unpulished thesis, Colombia University of National De Colombia, 2013) 25.
[182] Ibid.
[183] Mineral Resources and Energy Parliamentary Monitoring Group 'Combatting Illegal mining: Department of Mineral Resources briefing, in presence of Minister last accessed from' (2016) https://pmg.org.za/committee-meeting/23630/ on 14 April 2020.
[184] Hardin (note 176 above) 1244.
[185] Adler (note 178 above) 3.
[186] Ibid 2.
[187] R Challen 'Institutions, transaction costs, and environmental policy: institutional reform for water resources' (2000).

communities as common property."[188] Four general classifications of management systems are therefore explained in the literature on common pool resource management as "state property, private property, common property and non-property or open access".[189] Moreover, Hardin is further criticized for his assumption of a selfish motive on the part of users of the commons.[190]

Ostrom mentions that individuals in close proximity could manage common and shared resources.[191] Thus, users have the capability to create institutions to manage and govern their own resources. She also identified that self-governance and self-organization can be enhanced by new sets of rules on collective problems.[192] This assertion has been reinforced by the field research conducted in Nepal, Indonesia, Kenya and Maine on the management of common pool resources.[193] Hoadley & Limpitlaw argue that ASM miners have the capacity to create sets of rules and self-govern because formal and informal organizations and co-operatives which have internal self-regulation already exist.[194]

Lack of specific and effective legislation on ASM fails to recognize property regimes for the open access resources ASGM miners' use and does not facilitate the creation of rules for common property. In effect, a robust legislative framework should promote institutions that help "communities to employ their social capital in order to build a strong livelihood asset base". This belief agrees with Davies' claim that "institutions are the social cement which link stakeholders to access to capitals of different kinds, to means of exercising power and so define the gateways through which they pass on the route to positive livelihood adaptation".[195] This argument leads to the second theme of the literature review chapter, which is about livelihoods.

The first theme of the literature review has identified that ASM definitions differ legally from country to country. However, scholarly definitions have established that the activity is poverty driven, conducted by individuals, family or groups of people using traditional or manual tools.

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[188] Ibid.
[189] B Campbell et al. 'Challenges to proponents of common property resource systems: Despairing voices from the social forests of Zimbabwe' (2001) 29(4) *World development* 589-600.
[190] E Ostrom & C Hess 'Private and common property rights'(2000) *Encyclopaedia of law and economics* 332-379 333
[191] Ostrom (note 180 above) 416.
[192] Ibid.
[193] Ostrom (note 190 above) 342.
[194] M Hoadley & D Limpitlaw 'The artisanal and small scale mining sector and sustainable livelihoods' (2004) 9 *Mintek Small Scale Mining Conference, Book of Proceedings* 4.
[195] S Davies 'Livelihood adaptation. Paper for workshop. Making Livelihoods Work–Women, Men and Children in Rajasthan' (*IDS Brighton* 1997) 124.

The ASM sector is based on different legal status, that is, some are formal, informal, legal or illegal. The literature has highlighted that most ASM undertakings, especially in the SSA are informal and illegal due to several challenges. The sector is marred with a myriad of negative environmental, social and economic externalities such as accidents, pollution, social ills and corruption. Literature has proven that negative impacts have been exacerbated by illegality. Due to inadequate and inappropriate regulatory frameworks, the tragedy of the commons has resulted causing excludability and subtractability.

2.2 ASM as a livelihood strategy

This subsection discusses the second theme of the literature review chapter, dealing with livelihoods. I delve firstly into the nature of ASM as seasonal, permanent, or shock-push and pull, and examine the drivers of ASM. The second part of the discussion looks at the relationship between ASM and poverty. The subsection concludes with an overview of ASM and sustainable livelihoods.

2.2.1 Nature of ASM as Seasonal, Permanent, Push and Rush

ASM is an undertaking that can be recognized by the dynamics that motivate and drive the sector to grow and be identified as an activity for a livelihood. According to Weber-Far et al, ASM types includes, "seasonal, permanent, shock-push and rush artisanal and small-scale mining".[196] Comparable categories of ASM are submitted by Hentschel, et al as "permanent artisanal mining, seasonal artisanal mining, rush-type artisanal mining and shock-push artisanal mining."[197] Therefore, each of these types has diverse impacts on poverty as well as answering the question why people engage in artisanal mining.

Seasonal ASM is a form of mining that is undertaken by individuals who are not hesitant to engage in mining activities as an alternative means of income, if the gold bearing area is near or possibly relocating to rich mineral areas where they can derive a livelihood.[198] It provides an alternative activity, especially to an agro-based activity, where members of the community

[196] M Weber-Fahr *et al.* 'Mining and poverty reduction' (The World Bank Washington, DC 2001) 26.
[197] Hentschel et al. note 154 above) 37.
[198] J J Hinton 'Artisanal and small scale mining in Uganda: key issues, constraints and opportunities' (Summary Report Prepared for Ministry of Energy and Mineral Development, Department of Geological Survey and Mines, Uganda 2005) 5.

or individuals would for a season engage in mining as a source of employment. Seasonal ASM happen in certain periods of the year because of seasonal interchanging of activities or seasonal relocation of societies in artisanal mining areas.[199] Seasonal ASM can become profitable as it supplements income to the miners, especially, during unproductive farming periods.

Permanent ASM is conducted by persons who are permanently settled in an area with proven rich mineral resources, and a desire to conduct their operations for a long period of time.[200] Permanent ASM can be viewed as a full-time, year-round mining activity. In certain cases, seasonal miners end up giving up practicing agriculture to embark on mining permanently. So, Hinton and Hollestelle claim that permanent ASM is "frequently the primary economic activity for the community and is sometimes accompanied by other activities like farming or herding".[201] It is possible for permanent and seasonal ASM to be undertaken in the same area.

Shock-push ASM denotes mining catalyzed by critical and major interruptions, such as drought or conflicts, which often compel and force people to migrate to places where better economic prospects exist.[202] In desperate situations, the ASM may be chosen over other activities because it might be perceived as producing high returns with minimum cost. Equally, shock-push ASM is regarded by Hinton and Hollestelle, as a "poverty driven activity emerging after the recent loss of employment in other sectors, conflicts or natural disasters".[203] For instance, "in a situation of economic collapse of a state or sudden displacement due to civil war, communities may turn to ASM because it gives them immediate cash with very low barriers to entry".[204] Most communities would prefer ASM as an alternative because it gives communities income in a frantic circumstances with occasionally little, if any, genuine substitutes.

[199] Weber-Fahr *et al*. (note 196 above) 11.
[200] Ibid.
[201] J Carstens 'The artisanal and small-scale mining (ASM) sector and its importance for EU cooperation with resource-rich developing and emerging countries' (2017) 9 *Strategic Dialogue on Sustainable Raw Materials for Europe (STRADE). European Policy Brief* 21 at 5.
[202] Ibid 7.
[203] R Helga, A R T White, & A Lanjouw *Extractive industries and ape conservation* (eds) Cambridge University Press (2014) 166.
[204] Cristina Villegas *et al* 'Artisanal and Small-scale Mining in Protected areas and critical Ecosystems Programme' (WWF World Wide Fund for Nature (formerly World Wildlife Fund) and Estelle Levin, Ltd 2012) 26.

ASM in sub-Saharan is assumed by a lot of communities as a main alternative, but agriculture is a key source of livelihood.[205] Erratic rainfall patterns and poor agricultural yields have also contributed to the adoption of ASM.[206] There are however several other influencing factors like economic decline, job loss, unemployment, drought and floods that have forced communities to adopt ASGM as their principal off-farm livelihood activity.[207]

The rush-ASM type has the most serious environmental and socio-economic impact, because news of a major mineral strike can lead to mass migration of people in and to a particular area in a short period of time.[208] Rush-ASM refers to "large migration of artisanal and small-scale miners to an ASM site within a short period of time based on speculation and the hope of large potential incomes".[209] Miners in most cases are usually not residents of the area, and mining operations repeatedly lead to ominous social, ecological and health conditions.

Surprising, lack of consensus has been identified concerning what drives or pulls household heads, women and children to participate in ASM. ASM has turned out to be the main source of livelihood and a pillar for many miners and their dependents. There is a notion that the exceptional earnings of ASGM are a motivating factor.[210] Hilson contends that ASM miners "are lured by the prospect of extracting gold, which yields a substantial return on the market".[211] In addition, communities are certain that ASGM can contribute to financial independence as it can provide cash flow for business and domestic needs.[212] Several needs tend to be catered for by the availability of financial resources. The dramatic rise in ASM activities is undoubtedly driven by demand and increasing gold prices.[213] Consequently, in South Africa, critics maintain that miners and other opportunists are attracted into the sector by the ever-increasing market demand for gold and its high prices.[214]

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[205] G Hilson & S M Banchirigah 'Are alternative livelihood projects alleviating poverty in mining communities? Experiences from Ghana' (2009) 45 *The Journal of Development Studies* 172-196.
[206] Dreschler (note 148 above).
[207] Hilson & Potter (note 19 above).
[208] Hinton (note 198 above).
[209] Carstens (note 201 above) 7.
[210] Dreschler (note 148 above).
[211] Hilson & Potter (note 19 above)
[212] C Villegas, Ansumana Babar Turay & Daniel Sarmu 'Can Artisanal mining & conservation co-exist? *A Case Study of Artisanal Mining in and adjacent to Sierra Leone's Gola Rainforest National* Park and Recommendations on the Way Forward' (ASM-PACE Programme 2013) 7.
[213] Buxton (note 56 above) 11.
[214] Villegas (note 212 above) 8.

Another pull factor on ASM is found in areas where the prior, recognized and formal economy has failed primarily because of unsustainable and poor policy frameworks, political instability, conflict, serious corruption, and closure of mines, ASM becomes a strategy for survival for most people who live within rich mineral plots.[215] The dissimilarity between a survival strategy and a livelihood strategy is that the former is long-term and sustainable while the latter is temporary. Hayes points to the example of the Katanga Copperbelt in the DRC, where she highlighted that, "artisanal copper and cobalt mining did not exist during the years of state and private sector mining before the wars in the mid-1990s, but in just 15 years, however, it became a livelihood for over than 100,000 people in the province".[216]

This study draws on all potential ASM categories. In any particular locality, there may be miners that fall into different categories. The underlying drive to acquire a livelihood that would alleviate poverty and ensure that basic needs are met is also the same.

2.2.2 Drivers of ASM: Poverty perpetuation versus alleviation

This section sets out an understanding of ASM and livelihoods. It explores how the sector can improve wellbeing by reducing poverty. At the same time, ASM can maintain and extend poverty since individuals and communities at large are negatively impacted by the pull and push factors as they engage in ASM.

While the push and pull factors are unfolding, vulnerable people have had to find surviving strategies, and ASM has proven to be one such strategy out of desperation. ASM is a livelihood strategy adopted by several people in poor countries where the activity is undertaken informally. The relatively rudimentary technological requirements and simplicity of marketing arrangements make ASM the easiest coping strategy that vulnerable people can adopt.[217]

Poverty perpetuation

The broader question surrounding push and pull factors, however, is whether it contributes to long-term financial security and the reduction of poverty. Poverty is a multifaceted notion that captures the degree of lack or deficit to which an individual, household or community is

[215] K Hayes 'Regional Workshop: Small-scale Mining in Africa, A case for Sustainable livelihoods' (Common Fund for Commodities 2008) 21.
[216] Ibid.
[217] Knud Sinding 'The dynamics of artisanal and small-scale mining reform' (2005) 29 *Natural resources forum*.

exposed.[218] Poverty is "a human condition characterized by sustained or chronic deprivation of the resources, capabilities, choices, security and power necessary for the enjoyment of an adequate standard of living and other civil, cultural, economic, political and social rights".[219] Even though most of the literature on the concept of poverty emphasizes issues such as lack of income, food, access to housing and so on, the method to determine and establish the level of privation often remains subjective and fails to produce a correct indication of the variety of needs to which a particular social context is exposed.[220] Poverty, therefore, exhibits itself in all spheres of human life such as diet, health and wellness, education, accommodation, information and safe drinking water.

Culture of saving

In addition to identifying the drivers of ASM in Africa, the literature has also examined the way ASM can perpetuate poverty. The pursuit of ASM carries a number of negative externalities, as discussed in section 2.1.2 above. The literature indicates that there is little evidence of a culture of financial savings and investment from ASM incomes. As a result, poverty is perpetuated.[221] The way of life accompanying some ASM miners mostly migratory and *rush* ASM miners spend their income on alcohol and other consumer goods, instead of investing in family development.[222] Walsh describes the proceeds of ASGM in more migratory ASM communities as "hot money" which is spent quickly on "luxury" items such as beer and prostitutes.[223] This leaves the miners in serious levels of poverty, spending money hurriedly with the hope that they will quickly earn again, which is not always the case due to varied unknown factors.

"Artisanal miners can become entangled in ASM as they will be obliged and indebted to the so- called sponsors, or buyers and even other miners". Thus, "repaying the debt can be crippling and even extend poverty". According to Walsh, "dealers' terms and conditions of credit may

[218] United Nations Committee on Economic, Social and Cultural Rights 'Substantive Issues arising in the implementation of the International Covenant on Economic, Social and Cultural Rights: Poverty and the International Covenant on Economic, Social and Cultural Rights' (Geneva, 23 April-11 May 2001) 2.
[219] Ibid 2.
[220] Ibid.
[221] A Eftimie et al. 'Gender Dimensions of Artisanal and Small-Scale Mining' (A Rapid Assessment Toolkit, World Bank 2012)
[222] Bannock Consulting Ltd 'Vulnerability of Artisanal and Small-Scale Mining to Commodity Price Fluctuation' PAPER 3: Price and Other Risks in the Artisanal and Small-Scale Mining Industry (2006).
[223] A Walsh 'Hot money and daring consumption in a northern Malagasy sapphire-mining town' (2003) 30 *American Ethnologist* 292.

include control over miners' location and work, a share of the material, or high interest rates".[224] Miners will become further marginalized by failing to access markets or financial assistance. Although earnings from the illegal mining afford a considerable income, there is no economic improvement for individuals, households and community because of the instability of the basis, source as well as the volatility of earned cash.[225] Monies accumulated "from the illegal mining profession often do not contribute to food security as it fails to sustain but is spent in survival and on recreational items such as alcohol".[226]

Market forces

ASGM miners are "predisposed and often subject to outside market forces". But according to Bannock Consulting Ltd, the prices fixed by local buyers and intermediaries are often more influential than global market prices.[227] They further claim that this dependence perpetuates poverty because "it attracts more miners, further reduces alternative livelihood activity, and increases dependence on expensive commodities, thus contributing to a vicious cycle of local inflation".[228] Hence, "this can have a substantial negative effect on the local (non-mining) communities, causing previously accessible and inexpensive stuffs to become limited and unaffordable".

Non-financial hazards

ASM populations are also susceptible to "other non-financial hazards such as land eviction, conflict with large mines or the administration, calamities, health, resource depletion, environmental damage and social pressure".[229] These shocks can have enormous outcomes on the livelihood of ASM populations, particularly where they end in serious occurrence of accidents, and conflicts leading to loss of lives amongst the workers.

224 Ibid.
[225] R Nasi, A & N Van Vliet 'Empty forests, empty stomachs? Bush meat and livelihoods in the Congo and Amazon Basins' (2011) 13(3) International *Forestry Review* 358.
[226] L Coad *et al.* 'Distribution and use of income from bush meat in a rural village, central Gabon' (2010) 24 *Conservation biology* 1515.
[227] Bannock Consulting Ltd (note 222 above) 37.
[228] Ibid 13.
[229] Ibid 3.

Poverty alleviation

On the other hand, the literature on ASM also maintains that "ASM can alleviate poverty. ASM can enhance livelihoods in desperate situations such as economic recession and drought and floods".[230] The inspiration may be based on the belief that "ASM offers household heads instant money with very low barriers to entry". Buxton argues that ASM is a "resilient livelihood choice for people who are vulnerable or looking for economic diversity in their livelihoods".[231] In Sierra Leone, for example, "ASM of diamond and gold provides an income and indirect means of support for a predictable 900 000 people".[232] Therefore ASM has the potential to enhance household livelihoods since it can bring increased social and financial capital. This is why "most governments such as Sierra Leone, Mongolia, Ethiopia and Ghana have progressively recognized ASM as a genuine, acceptable and appropriate way out of poverty".[233] It is equally important to realize that the sector has the potential to facilitate the enhancement of wellbeing, food security, and sustainable use of resources given that they receive relevant support from the responsible stakeholders.

Self-employment

Hentschel views artisanal mining as a spontaneous "self-organizing working system under marginal economic conditions, providing no more than a daily living".[234] This approach is "supported by the authors of the Alliance for Responsible Mining who observed that ASM plays an important part in creating income for millions of poor people in less economically developed countries (LEDC) and developing countries".[235] ASM is thus also viewed as a "livelihood strategy that can alleviate poverty, undertaken by miners who have little or no capital. Jonsson & Fold discovered that artisanal mining is a livelihood activity that is undertaken to sustain life in Africa".[236] In Malawi, for example, ASM makes a significant contribution to rural livelihoods.[237]A growing number of people in Ghana have turned to

[230] Dreschler (note 148 above) 141.
[231] Buxton (note 56 above) 7.
[232] Villegas (note 212 above) 19.
[233] Buxton (note 56 above) 9.
[234] Hentschel et al. note 154 above) 63.
[235]Alliance for Responsible Mining (2013).
[236] J B Jonsson & N Fold 'Handling uncertainty: Policy and organizational practices in Tanzania's small-scale gold mining sector' (2009) 33 *Natural Resources Forum*.
[237] P J Kamlongera 'Making the poor 'poorer'or alleviating poverty? Artisanal mining livelihoods in rural Malawi' (2011) 23 *Journal of International Development* 1128-1139.

ASGM to escape from poverty.[238] In South Africa the ASM sector is estimated to employ "between 10,000 and 30,000 people[239] and the majority of the ASM undertakings take place outside the legal framework".

Researchers and policymakers in "Africa and Asia are always interested to know why illegal gold mining activity is so popular". The literature on ASM has identified a variety of factors that motivate miners to enter any category of ASM. "These factors contribute to displacement and forced migration." Research conducted in Zimbabwe indicates that "harsh economic conditions such as retrenchment and high unemployment levels were the main reason for adopting ASM as a livelihood approach".[240] Unemployment has also been identified as a driver for the adoption of ASM in Ghana.[241] Later findings show that "lack of employment, income from gold and drought are the main drivers pushing rural households to pursue ASM".[242] Hence ASM may be "pursued for the purposes of creating self-employment, establishing small business or creating local livelihoods".

Different types of ASM have been adopted mainly as a livelihood activity to alleviate poverty. The literature has highlighted that people are forced to undertake ASM activities as a form of employment due to desperation and as a means to survive. However, it has been vindicated that the activity perpetuates poverty because the undertakings are vulnerable to shocks, trends and seasonality such as conflicts, high mobility, and lack of financial and marketing support. Given that the relationship between ASM and poverty is negative; the following subsection looks at sustainable livelihoods as a concept to ensure resilience in ASM.

2.2.3 Sustainable Livelihoods

This section seeks to review the literature on sustainable livelihoods. ASM may be a livelihood, but in many localities, it is far from sustainable. Krantz points out that in analyzing sustainable livelihoods, "attention must be paid to the various factors and processes which either constrain or enhance poor people's ability to make a living in an economically, ecologically and socially

[238] G Hilson & C Potter 'Why is illegal gold mining activity so ubiquitous in rural Ghana?' (2003) 15 *African Development Review* 237-270.
[239] Ledwaba (note 54 above).
[240] Dreschler (note 148 above).
[241] Hilson & Potter (note 238 above).
[242] Yakovleva (note 157 above) 32.4

sustainable manner".[243] For the purpose of this study, the topic of livelihood assets contributes to the factors that constrain miners' ability to make a sustainable living from ASGM.

Humanitarian and developmental scholars have for long focused on the idea of a livelihood. Chambers and Conway define a livelihood as "people, their capabilities and means of living, including food, income and assets".[244] These scholars argue that livelihood is the coming together of individuals making productive use of assets, both tangible and intangible: A three-sided concept. Livelihood is also defined by Ellis as "the activities, the assets and the access that conjointly determines the living gained by the individual or household".[245] Thus people's ability to access and own assets to carry out activities assures them of a decent, secure and sustainable livelihood. According to Chambers and Conway;

> Assets include natural resources like minerals, land and water; social assets like community and family networks; political assets such as empowerment and rights of access; and human assets like education, knowledge and skills; activities, which refer to what the people in a community, use their assets for to earn a living. In this instance, the activities may include extraction, processing and marketing of the mineral; and entitlements, like those which are linked to legal or customary rights. An example is access to the property that is commonly owned.[246]

Livelihood is this more than the daily transactions of market exchange and household chores.[247] It encompasses "the management of social relationships, the affirmation of personal significance and group identity and the interrelation of each of these tasks to the other".[248] Thus, a livelihood is an all-encompassing concept pointing to the integration of people's social life and how they associate with one another together with their relationship towards their day-to-day business.

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[243] L Krantz 'The sustainable livelihood approach to poverty reduction' (2001) 44 *SIDA. Division for Policy and Socio-Economic Analysis* 5.
[244] R Chambers & G Conway *Sustainable rural livelihoods: practical concepts for the 21st century*. Institute of Development Studies (UK) (1992) 7.
[245] F Ellis *Rural Livelihoods and Diversity in Developing Countries*. Oxford: Oxford University Press (2000) 14.
[246] Chambers and Conway (note 243 above).
[247] S Wallman Eight *London Households.* London, Tavistock (1984).
[248] M Muritala *Livelihood in Colonial Lagos* Lexington Books (2019).

Gender, place of birth and socialization present numerous livelihoods. Some livelihoods might be improvised or acquired by choice, such as many ASM activities. Therefore, one might be forced to adopt and adapt a livelihood strategy because it is the only activity they are accustomed to while others out of desperation due to socioeconomic and environmental forces, find themselves undertaking ASGM.[249]

Livelihoods must however also be sustainable. Hilson argues that sustainability problems result from "inadequate legal and regulatory frameworks and low productivity, exacerbated by the application of rudimentary and inappropriate technology, which in turn impact on capacities to generate income".[250] For example, rush or seasonal activities are less likely to be sustainable as miners' income cannot be invested in other economic undertakings.[251] Thus, ASGM sustainability cannot be viewed independently of how it is categorized. It is also important to point out that mining and ASGM are based on depleting resources (assets/capitals) (minerals) therefore in of itself as an activity it is not sustainable, however it can be used to invest in other assets/capitals which are sustainable.

The term sustainability denotes a situation of equilibrium between environmental preservation and economic growth.[252] Sustainability reflects that development should not be at the expense of negative environmental impacts but rather be associated and made economically, socially and environmentally friendly.[253] With the rise in the global population and its associated fundamental challenges such as poverty, inequality, unemployment, and environmental degradation sustainability of both the environment and livelihoods is of high concern. Sustainability is a concept that seeks to stabilize the nexus between increasing over-exploitation of natural resources and economic development that disregards the environment. In this study, sustainability is a useful and unifying concept because it ensures long-term planning that could bring forth resilient livelihoods.

[249] R Shubhadeep et al. 'Basics of Livelihood in Rural Perspective' (2012) 391.
[250] United Nations Economic and Social Council 'Reports on Selected Themes in Natural Resources Development in Africa: Artisanal and Small-Scale Mining and Technology Challenges in Africa' (Economic Commission for Africa Third Meeting of the Committee on Sustainable Development' Addis Ababa, Ethiopia 2003) 7.
[251] Weber-Fahr *et al* (note 196 above).
[252] M P Todaro & S C Smith *Economic Development* (11th edn) Pearson Education Limited, England (2011).
[253] T Strange & A Bayley 'Measuring sustainability' (2009) *Sustainable development: linking economy, society, environment* 99-113.

The concept of sustainability is subdivided into four key categories; that is environmental, economic, social and human. Environmental sustainability is the utilization of natural resources responsibly and proficiently so that present and future generations can benefit. According to Goodland, economic sustainability demands that human development should result from the profitable use of value-added interest rather than from consuming capital.[254]

Social capital serves to invest and focus on services that create the basic framework for society. Some of these services include community participation and civil society involvement, as well as government involvement. Factors that promote social sustainability comprises of cohesion of community for mutual benefit, the association between sets of people, mutuality, commonly shared rules, tolerance, laws, and information.[255] Human sustainability on the other hand entails sustaining human capital and it includes education, health, knowledge, skills, health, leadership, ownership and access to services.[256]

The above-mentioned categories of sustainability work to accomplish sustainable development.[257] Sustainability, however, also rests on "sociocultural respect, community participation, political cohesion, economic sustainability and environmental sustainability".[258] From the above, one can posit that the term sustainability denotes a careful equilibrium among social, economic and spatial development in a manner that equally guarantees the needs of both the present and forthcoming generations.

The concept of sustainable livelihood is "a development model that has been in existence for many years".[259] The concept incorporates socioeconomic elements such as employment, education, access to infrastructure services and healthcare. Sustainable livelihood is therefore "a fundamental development approach that centers communities within decision making and

[254] R Goodland '*Sustainability: Human, Social, Economic and Environment* World Bank, Washington, DC, USA 2002) 2.
[255] T Manzi et al. *Social sustainability in urban areas: Communities, connectivity and the urban fabric*. Routledge (2010).
[256] I Šlaus & G Jacobs 'Human capital and sustainability' (2011) 3 *Sustainability* 97-154 at 105
[257] Ibid 100.
[258] Jennifer McConville & James R. Mihelcic 'Adapting life-cycle thinking tools to evaluate project sustainability in international water and sanitation development work' (2007) 24 *Environmental Engineering Science* 937-948 at 941.
[259] D Dent, O Dubois & B Dalal-Clayton *Rural planning in developing countries: supporting natural resource management and sustainable livelihoods* Routledge (2013).

all processes that affect them".[260] Thus, "sustainable livelihood approaches support interventions that lead to sustainable development".[261]

Sustainable livelihood as a development model is broadly "attributed to Robert Chambers at the Institute of Development Studies (IDS). The main reference is the 1992 discussion paper he co-authored with Gordon Conway".[262] At this point they offered a working definition not that different from the definition subsequently embraced by the Department for International Development (DFID), that is;

> A livelihood comprises the capabilities, assets (stores, resources, claims and access) and activities required for a means of living; a livelihood is sustainable which can cope with and recover from stress and shocks, maintain, or enhance its capabilities and assets, and provide sustainable livelihood opportunities for the next generation; and which contributes net benefits to other livelihoods at the local and global levels and in the short and long-term.[263]

Thus, the concept of sustainable livelihood seeks to eradicate poverty through sustainable strategies in a socioeconomic and environmental manner.

The Sustainable Livelihoods Framework (SLF) concept seeks to identify sustainable means such as resources and capacities to alleviate poverty. The framework focuses attention on a quantum of assets/capital that facilitate sustainable livelihoods.[264] The framework highlights the need to focus on asset variability, livelihood vulnerability and resilience.[265] Livelihoods are thus constructed through a variety of assets which are in this case ring-fenced by several laws. The DfID further indicates that a livelihoods framework encompasses five capital assets

[260] Ibid.
[261] Department for International Development (DfID) 'Sustainable livelihoods guidance sheets' (London: DFID 445 1999).
[262] Chambers & Conway (note 243 above).
[263] Chambers & Conway (note 244 above) 5.
[264]A Norton and M Foster 'The Potential of Using Sustainable Livelihoods Approaches in Poverty Reduction Strategy Papers' (Centre for Aid and Public Expenditure, Overseas Development Institute, London, UK 2001) 28.
[265] S Jorgensen & P B. Siegel 'Social Protection in an Era of Increasing Uncertainty and Disruption: Social Risk Management' World Bank (2019).

(natural, social, financial, human and physical); institutional processes and laws; resilience or vulnerability of livelihoods and livelihood strategies and outcomes.[266]

The SLF is a very useful model as it inspires policy research to determine and understand the multidimensional nature of poverty and vulnerability in relation to asset classes. In an ASGM context, these include natural resources (minerals, water, and land), human capital (education and health), social relations (associations, affiliations and social networks) , physical assets (houses, productive assets) and financial capital (access to financial support, markets and credits).

The SLF forms the core of the Sustainable Livelihood Approach (SLA) and functions as a tool for evaluating poor people's livelihoods. This study endeavours to use the SLF as an instrument to analyze livelihood assets.

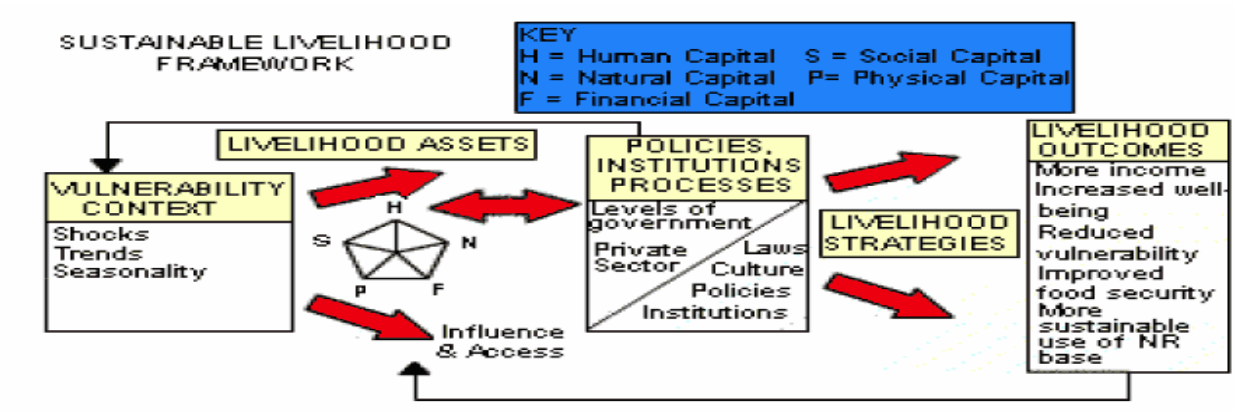


Figure 2.2: Sustainable Livelihood Framework. Carney, 2003[267]

The SLF shown in Figure 2.2 is an analytical tool that can be used to understand livelihood strategies and their interaction with processes, institutions and policies.[268] The framework works as a mechanism for the analysis of people's livelihoods, while at the same time evaluating a wide range of factors which hinder the achievement of sustainable livelihoods. The arrows shown in the framework show connections among the diverse constituents and

[266] Department for International Development (DfID) (note 260 above).
[267] D Carney 'Sustainable livelihoods approaches: progress and possibilities for change' London: Department for International Development (2003).
[268] Norton & Foster (note 264 above).

reveal how people transform assets to livelihood activities, or how laws and policies, institutions and processes influence the key components.

The five main aspects to be examined are: the livelihood assets, vulnerability context, transforming structures and processes (policy, institutions and processes), livelihood strategies, and livelihood outcomes.

2.2.3.1 Sustainable livelihood assets

Livelihood assets are the backbone of a sustainable livelihood. The DfID holds that, the assets are a vital component in developing capacity to cope and adapt to challenges within an individual and household level to survive.[269] As noted above, the SL framework incorporates five types of assets which are natural capital, human capital, social capital, financial capital and physical capital. [270] Natural capital includes the natural resource stocks (soil, water, air, land, minerals and genetic resources) and environmental services (such as the hydrological cycle, and pollution sinks).[271] However, as outlined in section 2.1.2 above, natural assets are subjected and exposed to negative externalities. Physical assets are those that miners need to undertake mining activities. Krantz defines physical capital as the simple infrastructure and tools and equipment required to sustain livelihoods and such infrastructure and tools may include housing, roads, schools and clinics.[272] Social capital refers to those resources that require coordinated action, such as networks, social claims, social relations, affiliations, and associations.[273] For example, relationships and networks between miners, buyers, guards and gold crushers are fundamental in facilitating common rules and self-regulation as it allows a certain degree of mutual understanding, shared values and trust to prevail. Financial capital refers to the financial resources people need to achieve livelihood objectives.[274] This includes cash, credit or debt, savings and other economic assets.[275] Human capital includes "the skills, knowledge, ability to labor and good health and physical capability important for the successful pursuit of different livelihood strategies".[276] Human capital represents the talents, knowledge,

[269] Department for International Development (DfID) (note 261 above).
[270] Norton & Foster (note 153 above).
[271] Krantz (note 243 above) 9.
[272] Ibid.
[273] Krantz (note 243 above).
[274] Carney (note 267 above) 39.
[275] Krantz (note 243 above) 13.
[276] Ibid

ability to work and good health that together enable people to pursue different livelihood strategies and achieve their livelihood objectives.[277]

2.2.3.2 Vulnerability context

Vulnerability is regarded as the dimensions of human life, or the assets or economic undertakings that are exposed to lose or harm when a disaster strikes.[278] Vulnerability arises as a product of individuals and their situations, and the broader context.[279] The SLF advocates minimizing the vulnerability of the poor by reducing seasonality, stress and shocks and offering safety nets.[280] The ability of the households to be capable to deal with and recover from shocks and stresses reveals their resilience.

2.2.3.3 Transforming structures and processes (Policy, institutions, and processes)

Social structures and processes need to be understood to achieve sustainable livelihoods. This study focuses more on this component as most ASM undertakings in South Africa operate illegally. Solesbury posits that, "institutions are the social cement which connect stakeholders to acquire capitals of different kinds, by means of exercising power and so define the gateways through which they pass on the route to positive or negative livelihood adaptation".[281] It is important to be familiar with institutional and social processes which underlie livelihood sustainability to realize limitations or obstacles and to identify prospects to sustainable livelihoods.[282]

[277] Carney (note 267 above) 39.
[278] A Lavell 'Relationships between Local and Community Disaster Risk Management & Poverty Reduction: A Preliminary Exploration.' A Contribution to the the 2009 ISDR Global Assessment Report on Disaster Risk Reduction (2009).
[279]Department for International Development (DfID) (note 260 above).
[280] W Solesbury *Sustainable livelihoods: A case study of the evolution of DFID policy* London: Overseas Development Institute (2003)
[281] Ibid 18.
[282] I Scoones 'Sustainable rural livelihoods: a framework for analysis' (1998) 12.

2.2.3.4 Livelihood strategies

Livelihood strategies are the various choices or strategies vulnerable individuals, and groups can pursue in order to deal with changes due to stress and shocks. Pursuing a livelihood strategy is a constant decision-making course which differs based on external circumstances. It may be systematic and periodic, regular and unanticipated. Moreover, strategies could also be reactive or forced, such as selling assets and migration.[283] The study focuses on ASM as a livelihood strategy, an activity undertaken to address the challenges associated with poverty and unemployment.

2.2.3.5 Livelihood outcomes

The framework recognizes outcomes as the accomplishments or achievements of livelihood strategies. Improved wellbeing, sustainable livelihoods, food security, vulnerability reduction to shocks such as accidents and diseases are some of the livelihood outputs within the realms of a SLF. [284]

In analyzing the concept of sustainable livelihoods, more focus should be placed upon issues and influences that boost poor people's ability to make a living in an ecologically, economically, and socially sustainable way.[285] In order to enhance the sustainability of ASGM as a livelihood activity Krantz argues that the focus should fall on;

> '(i) a community's capacity to cope with, and recover from, shocks and stresses; (ii) improving economic effectiveness, or the use of minimal inputs to generate a given amount of output; (iii) promoting ecological integrity by ensuring that livelihood activities do not irreversibly degrade natural resources within a given ecosystem; and (iv) enhancing social equity, that is, ensuring that the promotion of livelihood opportunities for one group does not reduce option for others'.[286]

[283] Ibid 14.
[284]Solesbury (note 280 above) 18.
[285]Krantz, (note 243 above).
[286]Krantz, (note 243 above) 10.

Community capacity denotes "what community insiders need to have, know, do, and be, in order to effectively influence the basic issues that affect them".[287] Sustainable livelihoods therefore, entail access to good governance and ecological, sociocultural, and economic resources. Crucial conditions are institutional capacity, ownership, access, control, equity of resources, and participatory and community-based decision-making.[288] Institutional capacity relies on the ability to work together, to cultivate common aims, purposes and methods, to manage conflicts and differences; and to integrate diversities into evolving community systems. ASM form part of a community, however, it is marginalized and isolated due to its clandestine and illegal nature. Therefore, it is mostly treated as lacking a community context.

Having discussed all the components of the SLF, key facets include the livelihood assets and the influence, access and control of the different assets by the ASM individuals to attain a livelihood outcome. The framework links ASM as a livelihood activity operating under the influence of varied laws that governs and regulates different assets. Chapters 5 and 6 analyze this nexus to identify the extent to which livelihood assets are moderated by the law and how the sector be better regulated. The interest of this study, therefore, looks at the capacity of the miners to operate within the confines of the law, given that a livelihood is sustainable when it is able to enhance its assets and capabilities, cope, adapt and remain resilient in the face of shocks and stresses for now and the future without forfeiting opportunities for the future generation.[289] Furthermore, through the empirical research findings to identify how ASM has positively and negatively contributed to livelihoods. Formalization of the sector through all levels of government (that is national, private and community-based), has undoubtedly become the panacea to sustainable livelihoods. The following subsection therefore examines the literature on formalization.

2.3 Formalizing ASM and ASGM

This section critically examines the third theme of the literature review, namely efforts made to formalize ASM. Firstly, it discusses the calls to formalize, the progress made and challenges being faced. Secondly, the discussion will dwell on the key debates on how governments can

[287] T Yaaba Baah-Ennumh & J A Forson 'The impact of artisanal small-scale mining on sustainable livelihoods (2017) *World Journal of Entrepreneurship, Management and Sustainable Development* 39.
[288] V Titi & N C Singh 'Adaptive strategies of the poor in arid and semi-arid lands: In search of sustainable livelihoods' (International Institute for Sustainable Development 1994).
[289] Chambers & Conway (note 244 above).

move forward with formalization, the link between formalization, assets and livelihoods, economic and social impacts and the relationship of ASM to Large-scale Mining (LSM). Lastly, the discussion will recall the debate on the tragedy of the commons, focusing on property rights theory to get a better understanding of the context and nature of ASM to formalization.

2.3.1 Calls for Formalizing ASGM

The driving forces behind attempts to formalize ASM have been the realization of the sector's economic contribution, along with concern to address negative externalities. Dzimunya et al explain that views on formalization are either narrow or broad.[290] The narrow view is associated with the legalistic view, in other words formalization involves conferring some form of legal title.[291] According to Davidson, mining permits and licenses are one step to enhance and grow ASM.[292] The broader view, on the other hand, involves registering, organizing and supporting the ASM sector.[293] Thus, formalization is not the existence of the legislation, but the implementation and execution of it.[294] This study adopts the broader view because it facilitates engagements and interactions with miners and other stakeholders.

Formalization of ASM has topped the agenda of numerous authorities. Several institutions, including the World Bank, now observe ASM formalization policies as a solution to the negative narratives about the sector.[295] Various African nations such as Ghana and Tanzania have tried to formalize ASGM by creating legal rights and implementing initial provisions as early as 1989 for miners.[296] Mongolia has arguably appeared to be at the front position of

[290] N Dzimunya et al. 'Formalisation of a roadmap to maximize the contribution of artisanal and small-scale mining in Zimbabwe' 2018 *Research Gate*.
[291] Ibid 4.
[292] J Davidson 'The transformation and successful development of small-scale mining enterprises in developing countries' (1993) 17 *Natural Resources Forum*.
[293] M Heemskerk 'Collecting data in artisanal and small-scale mining communities: Measuring progress towards more sustainable livelihoods' (2005) 29 *Natural Resources Forum*.
[294] S Lowe 'Consolidated report: Small--scale gold mining in the Guianas' (Report prepared for the WWF Guianas, Paramaribo 2005).
[295] World Bank 'Artisanal and Small-Scale Mining' (World Bank, 2013, last accessed from www.worldbank.org/en/topic/extractiveindustries/brief/ artisanal-and-small-scale-mining on 15 April 2020.
[296] R Maconachie & G Hilson 'Safeguarding livelihoods or exacerbating poverty? Artisanal mining and formalization in West Africa' (2011) 34 *Natural Resources Forum*.

formalization within the Asia-Pacific region, through the provision of mining licenses to small scale operators.[297]

Most governments in developing countries have recognized the importance of developing and expanding their economy by focusing on community sustainable livelihoods. Nonetheless, the processes of acquiring mining licenses are normally arduous, and this subsequently hinders formalization.[298] In some countries such as Zimbabwe, policies are crafted to favor the politically connected and reinforce the patronage system, therefore ASGM becomes subject to the politics of the day.[299]

In 1995 the World Bank initiated an international discussion on ASM in emerging economies to deliberate on the possibilities and difficulties of the developing informal sector.[300] According to Fisher, the consultation meeting made a call on governments "to transform the informal artisanal mining into formal mining operations by enabling miners to gain legal and transferable rights to mineral titles".[301] Following this intervention, Fisher reports that 36 African states were formalizing their ASM sectors or were in the process of doing so.[302]

However, Kambani also cautions that "artisanal mining causes a host of economic, environmental and social problems".[303] For this reason formalization debates are controversial,[304] and the plea to formalize the sector has essentially been a call to resolve its problems.

Many problems associated with artisanal mining "are considered to provide a good basis for banning it". Some interest groups have described artisanal mining as "nothing but a primeval type of mining with a host of problems and hence support the notion of banning it".[305] It has been further argued that the benefits claimed to come from ASGM are very minimal compared

[297] B Purevjav 'Artisanal and Small-Scale Mining: Gender and Sustainable Livelihoods in Mongolia' (2011) *Gendering the field: towards sustainable* 197.
[298] Maconachie & Hilson (note 295 above).
[299] S Siegel & M M Veiga 'Artisanal and small-scale mining as an extralegal economy: De Soto and the redefinition of "formalization' (2009) 34 *Resources policy* 51-56.
[300] World Bank (note 295 above).
[301] Fisher (note 27 above) 209.
[302] Ibid.
[303] S Kambani 'Small-scale mining and cleaner production issues in Zambia. (2003) 11 *Journal of Cleaner Production* 141-146.
[304] M Gibb 'Artisanal and small-scale mining in West Africa: an overview of sustainable development and environmental issues' (2006) *Small-Scale Mining, Rural Subsistence and Poverty in West Africa* 41-54.
[305] Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development (IGF) (note 10 above

to the harm it causes to the general environment. For many of the people engaged in artisanal mining, "earnings do not go beyond subsistence, and for that reason it is cannot be sustainable".

Nevertheless, the overall objective of formalizing artisanal mining is to ensure that organizations and coordination within the sector is maintained.[306] Notwithstanding some notable interventions, as an informal undertaking artisanal mining is not regulated by many governments and therefore lacks support for development. This is the reason why this sector continues to grow in an isolated and disorderly manner. Barreto identified two strategic objectives for formalization of artisanal mining that is: i) to make the sector formal, adopt newest technologies and to be socially and environmentally responsible; ii) to foster legality and participation in the context of governance.[307] This view accordingly focuses on formalization and legalization as two separate, yet overlapping strategies. Formalization of artisanal mining could yield positive outcomes such as profitability and a sustainable way of engaging with the environment.

Hayes notes that, "at the heart of it is that we're not just talking about artisanal mining being a problem, but a very real business and economic opportunity and a real part of the mining sector".[308] She argues that small-scale mining is a direct livelihood and urges governments to engage with the small-scale and artisanal mining sector through market incentives rather than penalties.[309] Hoadley and Limpitlaw maintain that,

> "without state support, measures to build the different capitals of sustainable livelihoods can only have limited success, but the following potential is present; formation into co-operatives and associations will reduce marginalization, open access to funding, training, technology and extension services (building social, human, physical capital)".[310]

[306] E Bugnosen 'Small-scale Mining Legislation: A General Review and an Attempt to Apply Lessons Learned' in Hilson, G. M (ed.) *The Social Economic Impacts of Artisanal and Small-scale Mining in Developing Countries* (2003).
[307] L Barreto 'Analysis for stakeholders on formalization in the artisanal and small-scale gold mining sector based on experiences in Latin America, Africa, and Asia' (2011) *United Nations Environment Programme* 1-85.
[308] K Hayes & F Wagner 'Artisanal & small-scale mining and livelihoods in Africa. Common Fund for Commodities' (Prepared for International Seminar: Small-scale Mining in Africa A Case for Sustainable Livelihood 2008) 10.
[309] Ibid 29.
[310] Hoadley & Limpitlaw (note 194 above) 4.

Hayes argues that providing opportunities to artisanal miners, rather than regarding them as a problem has numerous benefits.[311] Several calls for ASM formalization from various institutions and researchers have been made as a measure to achieve sustainable livelihoods and development. A formalized ASM can enable support systems such as property rights resolution, financial support, formal trade chain, access to government backing and long-term planning to become practicable.[312] Formalization of ASM is a sustainable intervention towards environmental sustainability. Thus UNEP, 2012 states that, "formalization is a process that seeks to integrate ASM into the formal economy and can only be successfully achieved if programs and public policy deal with the different dimensions of ASM activities simultaneously and in an integrated way".[313] Equally important to note is that formalization involves and informs better governance, enforcement and implementation of the environmental laws as involvement and integration of main stakeholders is indispensable.

A consensus view from the literature suggests that the operation of ASM informally and unlawfully intensifies social insecurity, instability and decreases access to social security nets, education and medical facilities. To this effect Hoadley & Limpitlaw suggest that, "recognition of, and capacity building in, development partners in the sector (such as, local government and development agencies) can compensate for the lack of enforcement and monitoring capacity".[314] Thus, formalizing the sector could condense these adverse features.[315] Therefore, the informality and illegality of ASM especially in South Africa require a sense of urgency to address and legitimize so as to realize positive attributes that the sector can yield to the socioeconomic condition.

2.3.2 Challenges to ASM formalization

The number of ASGM role players and their varied institutionalized interests in environmental and socioeconomic affairs is a threat to formalization. The degree to which diversity is mirrored

311 Hayes & Wagner (note 308 above) 2.
312 Buxton (note 56 above).
313 UNEP 'Analysis of formalization approaches in the artisanal and small-scale gold mining sector based on experiences in Ecuador, Mongolia, Peru, Tanzania and Uganda' (United Nations Environment Programme, Division of Technology, Industry and Economics (DTIE), Chemicals Branch, Geneva 2012), last accessed from https://wedocs.unep.org/bitstream/handle/20.500.11822/11357/Formalization_Document_Final_June_2012, on 13 April 2020 2.
314 Hoadley & Limpitlaw (note 194 above) 5.
315 Ibid.

in current policy dialogues on ASGM is a cause for concern particularly, in SSA countries.[316] Policy interventions towards formalization are oftentimes unsuccessful or fail largely because of "lack of appreciation of diversity in the sector".[317] Critical to note, is that increased legal regulation does not guarantee social and environmental improvement.[318]

The lack of appropriate and adequate regulatory frameworks for ASM is a major challenge for the formalization of the sector. Progress in applying "the insights of research and advocacy to national policy frameworks and moving formalization to the forefront of mineral governance agendas has been uneven and halting at best, especially in the Global South".[319] "While ASM provides a means of livelihood for many poor people, most governments still view it as an unsustainable and unacceptable way of life."[320] It is further argued that, "the negative image of ASM has expanded and persisted, and as a result, governments are not really committed to ASM". Thus, "they have dismissed it as a temporary activity that will disappear as miners return to their primary livelihoods".[321] The lack of specific policy frameworks for ASM is a major constraint in most African countries. Mutemeri & Petersen also point out that in some countries ASM legislation "is based on LSM, and yet ASM does not benefit from the same incentives as LSM".[322] In some countries, small-scale mining policy and regulations fall under the general mining policy, which makes no distinction between LSM and ASM. Thus, the unique challenges in small-scale mining do not receive the attention that they deserve. Even in countries with a distinct SSM policy, the processes for obtaining licenses are generally difficult, which becomes a barrier to formalization".[323] Without specific frameworks, ASM operators face challenges in obtaining mining rights.

Echavarria insists that since ASM is here to stay "it is a reality we need to deal with, and it may even be one of the keys to the challenge of reducing poverty and inequality".[324] The prevalent

[316] D Ferring, H Hausermann, & E Effah 'Site specific: Heterogeneity of small-scale gold mining in Ghana' (2016) 3 *The Extractive Industries and Society* 171-184.
[317] L Putzel et al. 'Formalization of natural resource access and trade' (Center for International Forestry Research 2014).
[318] K F Macdonald et al. 'Regulation of artisanal small scale gold mining (ASGM) in Ghana and Indonesia as currently implemented fails to adequately protect aquatic ecosystems' (2014).
[319] G Hilson and A Gatsinzi, 2014. 'A Rocky Road Ahead? Critical Reflections on the Future of Small-Scale Mining in Sub-Saharan Africa.' *Futures* 62: 1–9. doi.org/10.1016/j.futures.2014.05.006.
[320] Marta Echavarria *The impacts of payments for watershed services in Ecuador: Emerging lessons from Pimampiro and Cuenca* IIED (2004).
[321] Hilson & Gatsinzi (note 319 above).
[322] Mutemeri & Petersen (note above 50).
[323] South African Human Rights Council (note 58 above).
[324] Echavarria (note 31 above) 2.

impediment to transforming ASM is "its informal status, which precludes it from being recognized and receiving the support it requires". Davidson observed that the lack of "reasonable (legal) opportunities to mine compels artisanal miners to disregard the laws and pre-existing rights in order to secure their own livelihoods, even in countries where artisanal mining has been legalized". [325] He goes on to argue that "establishing legal frameworks is not enough, and that governments should identify deposits and areas amendable to small-scale development".[326] However, Hilson argues that there is a shortage of viable areas for ASM to formalize.[327]

Formalizing ASGM procedures and policies are also hindered by a non-compliant, unaccountable, and non-transparent systems of governance of extraction, thereby consolidating criminal syndicates to continue backing informal mining.[328] The criminal infiltration of ASM networks in a major obstacle to formalization of ASGM in SA. According to the BBC "the syndicates are a well-organized network and are multi-layered and levelled, involving mine personnel, the police and others".[329] Using a tiered approach to the mining value chain (see Figure 2.3), Munakamwe argues that illegally and legally mined gold tends to converge higher up the value chain (at the level of local syndicates and bulk buyers, front company exporters and international immediate companies).[330]

Illegal mining levels

[325] Davidson (note 292 above).
[326] Ibid 317.
[327] G Hilson 'Creating Rural Informality: The Case of Artisanal Gold Mining in Sub-Saharan Africa (2013) 33 *SAIS Review of International Affairs*51-64.
[328] Barney (note 139 above) 359.
[329] BBC, 2014 'South Africa illegal mining: Bodies found in Roodepoort' *BBC News* 26 February 2014, last accessed from
https://www.bbc.com/news/world-africa-26352807 on 16 April 2020 at 1.
[330] Munakamwe (note 70 above) *15.*

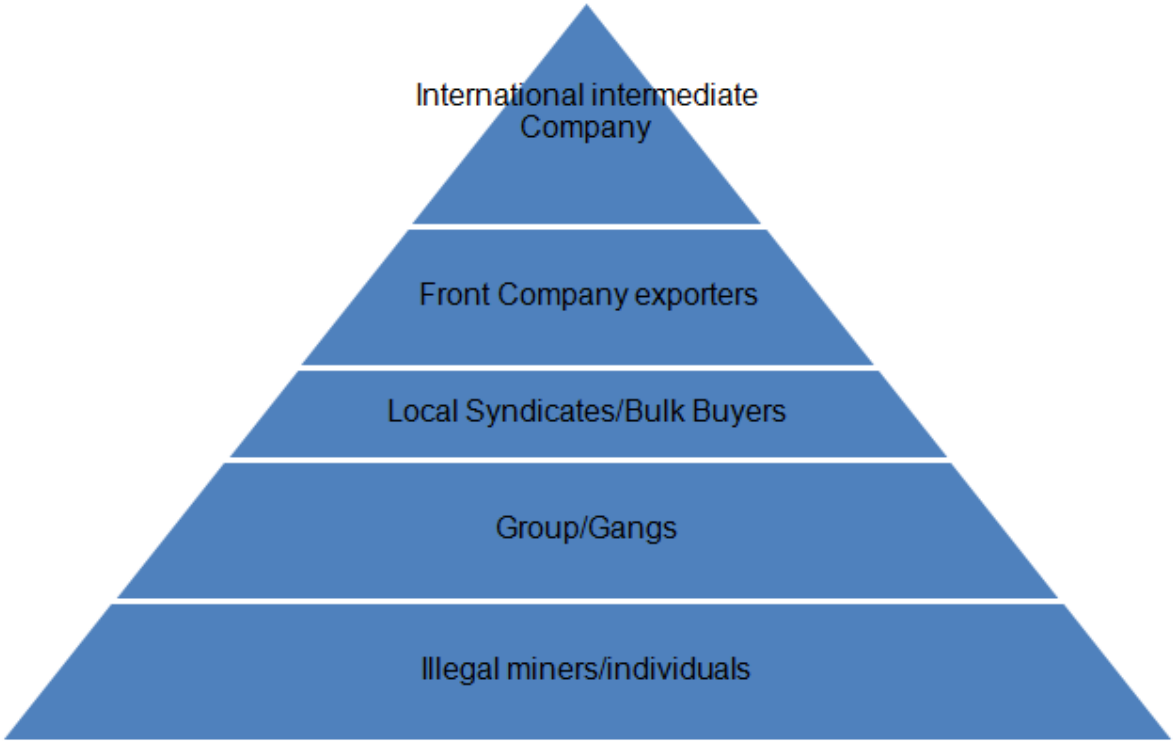


Figure 2.3 South African Human Rights Commission (2014)[331]

In these circumstances, it could be overly optimistic to formalize and regularize the vast and unregulated section. A pro-poor stance for ASM formalization that would allow for the reduction of illegality and all its forms would be limited formalization alternative.[332]

The figure above highlights how gold, locally mined is transformed and converted into a global commodity. Considerations of an existing "modus operandi" of labor arrangements, marketing chains and other self-regulations should be taken on board in any formalization program.[333]

It is believed that most miners involved in ASGM are immigrants looking for better livelihood means. Busilacchi states that, "understanding the systemic issues that drive households to engage in illegal activities in within regions is a prerequisite for designing effective interventions and diverting livelihoods toward sustainable trajectories, but is rarely applied".[334] Concerns have arisen about the porous nature of borders which facilitates and permits illegality

[331] J Love 'A report of the SAHRC Investigative Hearing; Issues and Challenges in relation to Unregulated Artisanal Underground and Surface Mining Activities in South Africa' (2014).
[332] Barney (note 138 above) 384.
[333] Ibid 365.
[334] Sara Busilacchi et al. 'Drivers of illegal livelihoods in remote transboundary regions' (2018) 23 *Ecology and Society* 10.

to increase and prosper. Illegal activities that thrive at these ports of entry include trafficking of people and smuggling of mining equipment, mineral resources and other goods,[335] due to high levels of corruption and low levels of law enforcement.[336] Illegal operations are also facilitated by lack of proper border management to prevent illegal migration which subsequently leads to unlawful activities in the host country. In South Africa, undocumented immigrants pose a challenge to the formalization of ASM. Artisanal miners are commonly regarded as non-actors since it is difficult to supervise the extraction, production and trading of the natural resources because their undertakings are unlawful and criminal.

Income earned by ASM miners is very low in comparison to the ultimate traded products on the upper level of the chain.[337] ASM formalization is hindered by a lack of incentives and financial support. Miners are forced to adopt a survivalist and short-term approach to sustain themselves. Proceeds gained from these operations hardly result in a long-term economic benefit. Natural resource utilization can only be understood by realizing and considering the reasons and motives of role players to be involved in illegal mining and operations at a grassroots level.[338] As a result, illegal mining activities become the root cause for the tragedy that emanates from shared resources belonging to people in a specific area.

Formalization as a policy option tends to be rigid in its approach, especially when it deals with the administration of costs and other procedural demands on miners aspiring to access new mining sites.[339] Similar to Davidson, Barreto argue for clear legal, land use planning and demarcation structures for ASM, followed by targeting policy packages for legalized operations. This should include support for technology upgrade and advancement, new methods and mining techniques, enhanced labor and environmental management standards, access to formal credit and advice for entrepreneurial, business management and development skills.[340]

[335] A Horstmann *Incorporation and resistance: Borderlands, transnational communities and social change in Southeast Asia* University of Oxford. Transnational Communities Programme (2002) 6.
[336] Tagliacozzo, Eric 'Border permeability and the state in Southeast Asia: contraband and regional security' (2001) *Contemporary Southeast Asia* 254-274.
[337] Munakamwe (note 71 above).
[338] Milner-Gulland et al. 'Ensuring applied ecology has impact' (2012) 49 *Journal of Applied Ecology* 1-5.
[339] Siegel & Veiga (note 299 above).
[340] Barreto (note 307 above).

Formalization may also be hindered by distance from markets and economic centers.[341] Twinamatsiko *et al* suggests that "there is a strong correlation between distance from the markets, with their services and infrastructures and engagement in illegal trade and poverty".[342] The miners find themselves relegated and marginalized as they work outside the focal economic framework and lack access to markets. As a result, they fail to get the essential support to do their work legally.

Formalization offers several advantages for the majority of artisanal miners. Miners anticipate some improvements in acquiring access to financial support services, technology and markets. A lot of miners wish to move from subsistence to small-scale commercial mining.[343] Several limitations, however hinder the miners, and chief among these, is the lack of access to financial support. Moreover, due to the illegal and criminal nature of the activity, the sector is regarded as high-risk activity and this precludes it from approaching financial lending establishments and potential investment opportunities that will fund ASGM operations and assist in the marketing of the mineral.[344] Improved productivity is therefore hindered by some of the above mentioned factors.

Weak governance and dysfunctional institutions have been identified as one of the main obstacles to achieving ASM formalization.[345] Proper implementation of formalization plans is built from a strong public administration. Mutemeri and Petersen observe that the weakness of the authorities has exacerbated a culture of informality.[346] Due to weak administration, formalization initiatives have side-lined progress and have dwelt on the criminalization of ASM.

Inadequate decentralization is another challenge. In South Africa, decisions are still made nationally with insufficient consultation with regional and local authorities, who have to deal with the ensuing environmental impacts and social conflicts or may have alternative visions

[341] P A Lindsey, et al. 'Dynamics and underlying causes of illegal bush meat trade in Zimbabwe' (2011) 45 *Oryx* 84-95.
[342] M Twinamatsiko *et al.* 'Linking conservation, equity and poverty alleviation' (International Institute for Environment and Development, London 2014).
[343] Davidson (note 292 above).
[344] Mutemeri & Petersen (note above 50).
[345] U Dorner et al. 'Artisanal and small-scale mining (ASM)' (2012) last accessed from http://pratclif.com/2015/mines-ressources/polinares/chapter7.pdf on 16 April 2020 at 6.
[346] Mutemeri & Petersen (note above 50).

and plans for development that are not based on minerals.[347] This means that local participation processes are not prioritized and municipalities are not tasked with monitoring mining without legal title. Nor are they given powers to suspend operations and confiscate any minerals that are traded and transported without a distinguishable origin. Thus, a number of formalization programs have failed or been abandoned by local authorities due to the lack of continuity, political will and capacity, and limited understanding of regulations that are often complex. Mining municipalities in South Africa also lack the capacity to police the security risks related to governing the operations by illegal criminal groups, and there are no regulations for managing confiscated minerals.[348]

Authorities must mitigate the challenges associated with the formalization of ASM, to ensure that positive contributions of the sector can be maximized. The following subsection focuses on key debates around how ASM formalization can be effected.

2.3.3 Key debates on formalization

The discussion on this sub-section focuses on how formalization should take place has given rise to a number of debates. These include the responsible authority for formalization, how formalization can be effected, approaches to formalization, the nexus between ASM and LSM, economic and social impacts, the link between formalization, assets and livelihoods, the role of property rights, and enforceability. This section, thus, develops a critical elucidation of the formalization literature that is linked to ASGM. This section closes with reflections on the potential ways and limitations to formalization further than a procedural and theoretical policy plan.

This following sub-section is structured into three parts to assist in debating how formalization could be effected. These include top-down (state-based initiatives) community-based approaches and neo-liberal (small government approaches).

2.3.3.1 Top-down Initiatives

[347] South African Human Rights Council (note 58 above).
[348] G Hilson *et al.* 'Artisanal and small-scale mining (ASM) in sub-Saharan Africa: Re-conceptualizing formalization and illegal activity' (2017) 83 *Geoforum* 80-90.

According to Matland, top-down approach means "the starting point is the authoritative decision; as the name implies, centrally located actors are seen as most relevant to producing the desired effects".[349] This entails that those at the "top" assumes power over those at the bottom. In this instance, the approach is mostly applied by national governments and even by international donor agencies such as the World Bank in policy implementation. Its concern is to ensure that the dominant ideology is integrated and assimilated by those that are being led.[350] The approach has been witnessed in many companies, whereby the top management prioritize, assess, determine, manage, and implement strategic business decisions and disseminate to lower rank employees to execute the tasks on a daily basis. Formalization of ASM, therefore, allows the government to attain a sense of security and sustainability by assuming a unitary view on behalf of the communities regarding the best ways of governance within the sector.

According to Cooksey & Kikula, the approach "allow rapid, large-scale spending of budgets in accordance with pre-established timetables and also gives government planners, donors and the bureaucrats an illusory feeling of control and efficiency".[351] This approach can be credited for its important role in advancing and promoting stability in community work, strong management and reducing risks associated with change.

However, a top-down approach flies in the face of 21st century principles of modern community development. The approach can infringe upon democratic freedoms and human rights as enshrined by the Human Rights Declaration.[352]This approach has an executive driven style which fails to ensure cohesion and consent and offers limited creativity to the affected and the community at large. Inevitably, most government initiatives are unsuccessful until they adopt and incorporate other favorable approaches such as community-based approach.

A top-down approach can also slow the response to challenges because it concentrates on central decision makers and not on the actors. Therefore, communities tend to disassociate

[349] R Matland 'Synthesizing the Implementation Literature: The Ambiguity-Conflict Model of Policy Implementation' (1995) *Journal of Public Administration Research and Theory* 145-174 146.
[350] K Popple *Analysing Community Work: Its Theory and Practice, Milton Keynes*: Open University Press (1995).
[351] C Brian & I Kikula 'When Bottom-Up Meets Top-Down: The Limits of Local Participation In Local Government Planning In Tanzania' (2005) 17 *Research on Poverty Alleviation* 3.
[352] C Gemma, B Crammond & T Riley 'Top-Down Approaches to Joined-Up Government: Examining the Unintended Consequences of Weak Implementation' (2015) 38 *International Journal of Public Administration* 167–178.

and distance themselves from any project that they assume has been imposed on them. Formalization of ASM through government's top-down approach might fail to realize the intended outcomes due to lack of buy-in.

However, according to Alphonsus a State-led approach has been upheld to be more effective, goal realizable and successful on scientific and innovative technological developments. [353] Most local communities may lack access to scientific innovation and skills, for instance geological data, experts and other professionals might design necessary data and programs that the communities might adopt and use to their benefit.[354] Correspondingly, Larice & Macdonald, assume that top-bottom approach can facilitate the implementation of the set proposals.[355] Thus, other processes such as community or stakeholder participation and consultation meetings becomes easy to be executed as the government will have defined the formalization initiatives and roadmap in advance, such as environmental management, financing incentive and trade of minerals.

In a top-down approach, the responsibility to formalize ASM lies with the government. The ASM miners are unlikely to organize themselves, and there are no large business interests who would act. Governments have the power to set policy and enact legislation, so logically it should be their responsibility.

Formalization of ASM contributes positively and has benefits for governments. Firstly, where ASM operates in a coordinated and organized manner, illegal activities are identified easily. So, for governments, formalization has the potential of eliminating and restricting illegal mining, smuggling and illicit trade. For example, illegally mined and traded minerals have supported civil wars and conflicts in SSA.[356] In Liberia, Sierra Leone and the Democratic Republic of Congo (DRC), the procurement of arms and other weapons have been mostly funded from the proceeds of "conflict diamonds".[357] Coltan, in the DRC has also been

[353] I Alphonsus & M Sabran 'Evaluating the top-bottom and bottom-up community development approaches: mixed method approach as alternative for rural un-educated communities in developing countries' (2016) 7 *Mediterranean Journal of Social Sciences* 266.
[354] K Chiranjeewee & H Vacik 'Comparing a top-down and bottom-up approach in the identification of criteria and indicators for sustainable community forest management in Nepal' (2011) 85 *Oxford Journals: Forestry* 145 -158.
[355] L Michael & E Macdonald *The urban design reader: Routledge* (2007).
[356] J K Murhula 'Minerals, Forests, and Violent Conflict in the Democratic Republic of the Congo' (2006) 12 *Environmental Change and Security Program Report* 12.
[357] B Hofstatter 'Liberia: Trade, Environment, and Conflict (Inventory of Conflict and Environment Cases 2001).

identified as one more source of prospective child labor, human rights abuse and intra and inter-state conflicts as different groups fight for its control.[358] Furthermore, illegal trading and trafficking leads to other forms of illegal activities and governments lose large sums of money. It has been estimated that in Zambia, DRC and Zimbabwe, precious minerals have been traded unlawfully at a value of US$ 200-30, 400 and 3 million, respectively.[359]

Secondly, formalization of ASM would enable governments to broaden their revenue bases.[360] In many SSA countries, unemployment is very high, and very few people are in formal employment due to numerous economic restructuring programs. The tax base is small. If the ASM sector was formalized, miners would also be qualified to remit taxes, hence contributing directly to tax revenue. These revenues could be ring-fenced to ensure better services to communities in and around mining sites.

The ASGM sector also has the potential for advancement to medium-scale mining, involving the employment of technology and accessing rich gold deposits. Demarcation and the right of use allocated or permissible to grassroots level could be spread out for local advantage, while also evading costly and highly administrative formalization procedures.[361] This will enable support packages, such as, provision of credit and technology from the state or donors to facilitate mining activities that operate illegally to shift towards a fully professionalized formal sector.[362]

All the levels of government that is the national, provincial and local should act to formulate, implement and enforce legislation. In addition to enacting adequate regulatory frameworks, governments can take the lead on collating basic population data, education and training, financial support, LSM and ASM partnerships, enhancement of environmental practices as well as safety and health.

"conflict diamonds" also called blood diamonds means 'diamonds mined in war zones and used by rebel movements to finance insurgency, conflicts or warlord activity aimed at undermining legitimate governments. The term highlights negative consequences that result from diamond trade.

[358] M Mbuzukongira 'Occupational radiation exposures of artisans mining columbite–tantalite in the eastern Democratic Republic of Congo' (2007) 27 *Journal of Radiological Protection* 187.

[359] S Kambani 'The Socio-Economic Impacts of Artisanal and Small-Scale Mining in Developing Countries' (2003) 315.

[360] Bugnosen (note 306 above).

[361] Ibid.

[362] K Lahiri-Dutt *Between the Plough and the Pick: Informal, Artisanal and Small-Scale Mining in the Contemporary World ed* ANU Press (2018).

National governments can facilitate formalization of the ASM sector by collecting basic demographic data. Several countries lack accurate and comprehensive demographic data on artisanal and small-scale miners.[363] Hilson has observed that poor understanding of the sector has led to the incompatible support related interventions that had led to numerous unfavorable outcomes.[364] Formulation and implementation of appropriate regulations that mirror the needs of the sector by the government can only be more effective when there is availability of key data.

Effective formalization can be championed by building capacity in government institutions (improved human capital, general production capacity for miners to assist them become part and parcel of the formal economy),[365] and the miners themselves. For the latter, there is a need to build capacity in suitable areas such as geology, business management, mining operations, entrepreneurial skills, administration and marketing. Awareness programs on wider issues such as drug abuse, health and safety, HIV/AIDS and child labor must also be put in place. Consequently, to get the message across to the miners, awareness programs must be put in place to cover extensive issues facing their mining communities.

Governments can also support ASM undertakings by creating and establishing financial institutions and policies for micro-finance and encouraging these organizations to support the miners by offering access to working capital and flexible terms of repayment.[366] Moreover, the government can expedite loans for the purchase of important equipment such as compressors, jackhammers, generators, and ball mills. Apart from these actions, incentives such as training and technical support can be executed by the government to encourage and inspire miners to formalize and operate legally.[367]

Government has a role to play by reflecting on its own structures. A highly centralized and bureaucratic system constrains ASM miners from operating legally.[368] The government should reflect on how accessible its structures are for the regulation of the complete gold value chain

[363] G Hilson & O Maponga 'How has a shortage of census and geological information impeded the regularization of artisanal and small-scale mining?' (2004) 28 *Natural Resources Forum* 22-33.
[364] H Gavin 'Farming, small-scale mining and rural livelihoods in Sub-Saharan Africa: A critical overview' (2016) 3 *The Extractive Industries and Society* 547-563.
[365] Hilson (note 363 above).
[366] Dzimunya et al (note 290 above).
[367] Ibid.
[368] S M Banchirigah & G Hilson 'De-agrarianization, re-agrarianization and local economic development: Re-orientating livelihoods in African artisanal mining communities' (2010) 43 *Policy Sciences* 157-180.

(licensing of claims, extraction, and gold buying licenses).[369] A decentralized system, with registration offices in several districts, should allow for easy access by miners. Litvack describes decentralization as "the transfer of authority and responsibility for public functions of the central government to subordinate or quasi-independent government organizations or the private sector".[370] Therefore, for decentralization of the registration process to be fruitful government must provide adequate infrastructure in the form of district centers meant for ASM administration. Lombe submits that registration offices should be capacitated and adequately equipped to ensure quality delivery of services.[371] Moreover, Rondinelli also notes that governance systems to ensure accountability, transparency and public trust should be put in place to enable communities to react appropriately to the administration of ASM.[372]

Governments also have a significant role to play in occupational health and safety and environmental standards. ASM activities, in general, negatively affect the environment where they operate. Governments should therefore focus on issues such as increased awareness about mercury exposures and hazards, establishment of environmental management training, and making environmental training a prerequisite for accessing hire purchase loans for equipment. Incorporation of other related issues such as health and safety practices into environmental training programs is important to enhance safety.[373] Many forums have discussed environmental degradation originating from ASM, such as landscape destruction and mercury pollution and contamination. Governments can enforce environmental responsibility among miners by formulating sound environmental guidelines and policies alongside providing miners with training in environmental issues. Hilson augments that a culture of environmental responsibility among miners can be achieved by effective monitoring and enforcement programs.[374]

Formalizing ASM facilitates government support through extension services to miners in that way assisting them develop their production capacity and earnings. Granville cites Tanzania, where extension services have empowered miners to benefit massively through increased

[369] Dzimunya et al (note 289 above).
[370] J Litvack 'What is Decentralization' (World Bank), last accessed from http://www.ciesin.columbia.edu/decentralization/English/General/Different_forms.html on 17 April 2020.
[371] Lombe (note 146 above) 96.
[372] D A Rondinelli & S Cheema *Decentralization and development: Policy implementation in developing countries* eds Beverly Hills (1983).
[373]Dzimunya et al (note 290 above).
[374] G Hilson 'Small-scale mining and its socio-economic impact in developing countries' (2002) 26 *Natural Resources Forum*.

output.[375] In Zimbabwe, mine geologists used to provide miners with geological information free of charge whenever they embark on routine mine visits to help miners with geological problems.[376] These are necessary forms of support that capacitate artisanal miners to conduct mining responsibly and effectively.

Governments can foster environmental responsibility amongst miners.[377] Environmental concerns arise from the use of cyanide and mercury pollution, landscape destruction and deforestation among others. This is possibly a major reason why many interest groups campaign for banning artisanal mining. Philips, suggest that environmental responsibility among miners can be cultivated by effective formulation and execution of environmental policies together with providing training in environmental issues.[378]

Governments can put in place measures to track all mineral movement and ensure that all miners bring their produce to responsible government authorities, thereby restricting smuggling.[379] For example, several reports on cross border crimes have indicated that border control law enforcement officers have not managed to arrest the problem of gold smuggling from Zimbabwe.[380]

Government needs to support partnerships between ASM and LSM such as tribute mining. Tribute systems as funding methods can be utilized to support the activities of ASM. Successful models of tribute mining have been witnessed in a "Zimbabwe Zimasco Tribute System for chrome mining".[381] Bugnosen also mentions an example of the Philippines, where a mining partnership exists whereby the government, ASM and the Benguet Corporation, a mining corporation allows the small-scale miners to work on a demarcated mining land.[382] Thus, formal networks are created between LSM and ASM as well as with other role players to facilitate formalization of ASM. ASM miners can be supported through knowledge sharing as

[375] A Granville 'Baseline survey of the mining and minerals sector' (Report for Southern Africa MMSD 2001), last accessed from https://pubs.iied.org/pdfs/G00601.pdf? On 17 April 2020 68.
[376] Ibid.
[377] Hilson (note 373 above).
[378] L C Phillips 'Why formalize artisan miners' *Conference on Enterprise Formalization in Africa, Accra, Ghana*. 2007., January 10-11, 2007, Presentation, Washington, DC, International Finance Corporation, unpaginated.
[379] Dzimunya et al (note 290 above).
[380] Ibid.
[381] Dzimunya et al (Note 290 above) 49.
[382] E Bugnosen 'Country case study on artisanal and small-scale mining: Philippines' (2001) 83 *Mining, Minerals and Sustainable Development* at 6.

well as the provision of secondhand equipment. Thus, collaboration within these two sectors demands that accountability, transparency, and fair relations be installed as key values.[383]

Small-scale miners sometimes encroach into the claims owned by large-scale mining (LSM) operations. This is because LSM has access to mineral rights and the ASM sector is usually left with smaller and poorly mapped areas. Government can facilitate ASM formalization by mapping areas suitable for ASM. Existence of geological and geographical information on the location and distribution of minerals enables governments to allocate land specifically for the ASM sector.[384] According to Hilson and Maponga, geological data is "a necessary prerequisite for determining, and demarcating locations appropriate for ASM activity".[385]Moreover, miners are motivated to become responsible and operate within the confines of a legal framework if a secure tenure and access to secure claims is guaranteed. At times, governments or local authority's apportion land that has no valuable mineral deposits.[386] Thus, lack of access to suitable land as a result becomes an impediment and for this reason, artisanal miners' ability to register is limited.

2.3.3.2 Community-based Approaches

A community-based approach is defined by the United Nations High Commission for Refugees (UNHCR) as "a way of working in partnership with persons of concern during all stages of any given program cycle".[387] This approach is also based on highlighting the active role of the community in identifying, diagnosing and identifying matters that affect them. The approach supports and strengthens a community's responsibility to control any given project by ensuring that empowerment programs for local actors are implemented. Therefore, formalization of ASM can be effected by involving all interested parties from the formulation, planning, implementation stages and in all monitoring exercises.

Notwithstanding several benefits, the community-based approach also has some challenges. These limitations impede the success of this approach. Some processes under this approach

[383] Echavarria (note 31 above).
[384] Hilson & Maponga (note 263 above). 25.
[385] Ibid.
[386] Hilson & Maponga (note 263 above).
[387] Community-based approach in United Nations High Commissioner for Refugees (Geneva 2008).

such as community consultation require more time.[388] Therefore, decisions cannot be taken quickly before stakeholder and other community organization buy-in. This may delay or disrupt other important processes.

The capacity of community stakeholders within this approach is also affected by the relationship between government and donors. Pressure from funders may push the government to bypass community-based approach principles and approve certain policies to please donors. [389] The limitation again emanates from the lack of shared vision from the role players regarding the best ideology or policy position on ASM formalization. Central to this approach is to create a win-win end, however, while it is important to bring the concerned parties to the table, it is difficult to please everyone.

Several critical success factors on this approach can be attributed to high levels of accountability and a sense of ownership. The agreed objectives, costs, delivery time and desired quality of any project, or intervention can be achieved through involving all relevant community stakeholders. This has been witnessed in post-disaster situations in Indonesia on rehabilitation projects.[390]

According to Amaratunga and Keraminiyage community-based approaches minimize corruption since transparency and accountability can be guaranteed.[391] A culture of accountability emanates also from a sense of ownership and belonging.

Barreto posits that "the complexity of the ASGM sector calls for fresh approaches to formalizing the sector beyond the traditional command and control mechanisms, meaning combining command and control mechanisms with economic instruments and community management mechanisms".[392]

Formalization of ASM can be facilitated by government instituting cooperatives within the ASM sector and fully supporting them with financial, technical and training facilities. Government can evaluate the resources required to establish the satellite cooperatives and

[388] T Ophiyandri, D Amaratunga & K Keraminiyage 'Advantages and limitations of community-based post-disaster housing reconstruction projects 2016 *International Journal of Disaster Resilience in the Built Environment*.
[389] C Davidson *et al*. 'Truths and myths about community participation in post-disaster housing projects (2007) 31 *Habitat international* 100-115.
[390] Davidson *et al*. (note 385 above).
[391] Ophiyandri et al. (note 388 above).
[392] Barreto (note 307 above) 12.

facilitate training of members. Associations and partnerships are easy to monitor, have minimum chances of deceit, can facilitate and support coordination among miners and bring a favorable atmosphere for capacity building.[393] A successful example of such models that can be adopted include the Tanzanian Women Miners' Association (TAWOMA).[394] TAWOMA is keenly involved in identifying market links, creating a favorable environment for relationships between small and large-scale miners for knowledge exchange, advocating for and training small scale miners, as well as offering input to legal reforms.[395]

Stakeholder participation is a process that involves the involvement of local people to share information and make decisions.[396] Policy and legislative development to support ASM formalization must entail stakeholder participation.[397] To avoid a charge that consultation is being conducted to rubber stamp predetermined objectives,[398] the purpose and objects of the consultation process must be clearly defined.

Formalization of artisanal mining would facilitate deeper engagements and relationships between governments and local and international NGOs concerned with sustainable livelihoods and poverty reduction.[399] It is believed that these organizations have the propensity to assist miners with relevant technical, financial and training support in their activities. Recognition of the positive impact of education and training to ASM formalization is critical in the reduction of pollution in all its forms, deforestation, tax avoidance and so forth.[400] Investment in education and training helps miners appreciate the need to operate legally and use the natural environment and financial resources responsibly.

Formalization provides miners the right to access localized training and technical skills. Fundamental skills are required to reduce the high rate of accidents amongst miners and their communities. It is suspected that, these incidents are due to lack of knowledge of the hazards

[393] Dzimunya et al (note 290 above) 49.
[394] UNEP (note 313 above).
[395] UNEP (note 273 above) 18.
[396] Heemskerk (note 293 above).
[397] Anantha K Duraiappah, Pumulo Roddy & Jo-Ellen Parry 'Have participatory approaches increased capabilities*?'* (International Institute for Sustainable Development 2005).
[398] Heidi Berger-Bartlett & Toni Craig 'The Challenges of Stakeholder Participation: examples of evaluation projects from the Youth Justice context' *Australasian Evaluation Society International Conference*. 2002.
[399] Mutemeri & Petersen (note above 50).
[400] Dzimunya et al (Note 290 above) 45.

linked with mining.[401] Most people engaged in ASM are poorly trained, they lack understanding and requisite information about mining and are often unmindful of the dangers associated with mining.[402] Also, miners lack technical expertise of mining and ore evaluating methods. For this reason, several miners fail to produce an output that surpasses the subsistence level. Community-based technical training and advice on mining practices is required to increase production output for artisanal miners.[403] Lack of quality education and training eliminates miners from connecting with a variety of grassroots or local stakeholders such as marketing and technological agencies because they lack marketing and other skills to network.[404]

Community-based approaches have the propensity to effect formalization. The literature has indicated that cooperatives, partnerships, associations and other community-based organizations can be a vehicle to implement formalization. Therefore, the governments and other stakeholders can assign programs such as training in various mining related programs, registration and general administration as well as financial and technical support plans to be executed by community management mechanisms.

2.3.3.3 Neoliberal (Small Government Approaches)

Neoliberalism is defined by Harvey as an economic and political approach that "proposes that human well-being can best be advanced by liberating individual entrepreneurial freedoms and skills within an institutional framework characterized by strong private property rights, free markets and free trade".[405] This approach is a modification or a revival of liberalism that upholds free market, low state intervention and individual rights. [406] Neoliberalism is an approach and ideology that is usually associated with free movement of goods and services, wealth accumulation.[407] The definition, therefore alludes to the fact that individuals can obtain distinct private property rights with low state intervention and absolute access, use and control

[401] Mining and Sustainable Development Project 'Breaking new ground: mining, minerals, and sustainable development: the report of the MMSD project' (IIED London 2002) 348, last accessed from https://pubs.iied.org/pdfs/9084IIED.pdf on 12 April 2020.
[402] Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development (IGF) (note 10 above).
[403] Hilson (note 373 above).
[404] Mutemeri & Petersen (note above 50).
[405] David Harvey *A brief history of neoliberalism*. Oxford University Press (2007).
[406] Oxford English Dictionary 1989a.
[407] Dag Einar. Thorsen 'The neoliberal challenge. What is neoliberalism?' (2010/ 2 *Contemporary Readings in Law and Social Justice* 188-214.

of the property. Therefore, formalization of ASM can be implemented through the property rights regime whereby individuals or groups might acquire mining rights and other associated rights on a particular land. However, there is also no doubt that modern society has been exposed to several problems of inequality and unemployment from the effects of small governments. [408]

In contrast to top-down initiatives that focus heavily on command-and control, neo-liberal contributions to the debate on the formalization of ASM center on the simple legalization of property rights as a path to more sustainable artisanal mining. Property rights would be helpful to miners as collateral to access credit elsewhere. Furthermore, failures in environmental management might be because of lack of property rights. Having secure rights might cause the adoption of more environmentally sound techniques and respect for environmental laws. Miners' ability to access secure claims becomes not only an incentive for investment, but for the undertaking to operate within the sector's legal framework.

The granting of property rights is perceived as an approach with three simple categories, namely, "a right to land title, a right to minerals and a right to mine".[409] However, in almost all modern mineral jurisdictions, the right to minerals vests in the state, people or president on behalf of the people. A series of supportive reforms would match this, comprising legalized trading rights, the explanation of overlapping, unclear regulatory frameworks, and the restructuring of rigid administrative problems that can be a barrier to ASGM formalization in practice. There is a need to look at the rules around the ownership, access and control of all the assets, not only the property rights dealing with the right to land title and the right to mine.

The tragedy of the common theory is significant, not only because it revealed the common challenges; others had outlined this fundamental complex in the past, but because it propagated and circulated an appropriate way of conceptualizing many environmental complications.[410] The imagery of the commons can be transferred to practically any environmental resource. For example, the focus of analysis can be on the extraction of mineral resources by ASGM. It is

[408] D E. Thorsen 'The neoliberal challenge. What is neoliberalism?' (2010/ 2 *Contemporary Readings in Law and Social Justice* 188-214.
[409] J McQuilken & G Hilson 'Artisanal and small-scale gold mining in Ghana' (Evidence to Inform an action Dialogue. IIED, London 2016).
[410] Adler (note 178 above) 3.

significant to highlight that the tragedy of the commons can be obviated by the instituting private property regime because it acts as an antidote to overuse due to demand.[411]

Adler mentions that "the pursuit of self-interest in an open-access commons leads to ruin without controls on access and use of the underlying resources, the tragedy of the commons is inevitable".[412] A different approach to the commons must be adopted.[413] The social measures and activities that produce commitment are arrangements that generate duress, of some sort, for instance taxing. Mutual coercion and the institution of private property are the two essential recommendations presented to deal with the tragedy of the commons.[414] However, collective action and collaboration have been seen as a chance to overcome the tragedy of the commons, especially for renewable common pool resources.

According to Barnes, "property is a legal object that regulates its use by a legal subject".[415] Property rights theory offers a "means to achieve and signifies a social order that represents an economic organization and a mode of public and economic organization".[416] The structure and organization of property system influence how people interrelate as well as how the communities are shaped and arranged. Thus, the idea behind rights is of considerable importance, for example, what kinds, forms and nature of property are viewed as lawful to manage particular societal resources.

Essential to note upon regulating ASM is the general context and content. Thus, in selecting parties to be granted property rights responsible governments should ensure that due diligence is exercised to ascertain and certify the prospective miner's capacity. Furthermore, inadequate property rights might translate to irresponsible environmental management. This view also entails that property rights goes together with the regime of entitlements, exclusivity and tradability. Long affirms that granting exclusive rights by issuing permits constitutes a "de facto private property".[417]

[411] Ibid.
[412] Adler (note 178 above) 3.
[413] Hardin (note 176 above).
[414] Adler (note 178 above).
[415] Richard Barnes *Property rights and natural resources* (2009).
[416] Joseph William Singer *Entitlement: The paradoxes of property* (2000).
[417] K R Long, 'Economics of mining law' (1995) 4 *Nonrenewable Resources* 74-83.

Some property challenges are associated with the land issue. In most instances, miners do not own the land on which artisanal mining operations are predominant. This leads to the question concerning allocation of land and ownership. For example, if a responsible government apportions and hands out specific lands for ASM activities, an explanation on whether the mining rights granted are linked to surface and/ or subsurface rights is imperative.

The execution of an economic theory of property rights, as advanced by a series of studies most notably by De Soto in regard to ASM reform, show the limitations and strength of this method in developing countries.[418] As earlier noted, in most mining jurisdictions minerals vest in the State, regardless of whether mineral deposits are located on public or private lands.[419] Responsible governments might in most cases have a conflict of interest, in their position as a responsible authority as they are obligated to progress public welfare, and in the position as landowners, are driven by profit maximization.

Governments are also advised to create mineral right markets with the intention to encourage the advancement of beneficiation and effective utilization.[420] From the standpoint of "law and economics", the major purpose is to come up with mineral rights that are maintainable, safe and sustainable that will trade openly and freely as de facto private property rights.

Earlier discussions indicated that almost 80 percent of ASM activities are carried outside the legal frameworks, without protecting property rights, and avoiding direct taxation.[421] One of the first challenges a "law and economic approach" to ASM formalization would need to overcome, is to determine the relative efficiency of leaving the ASM sector unregulated, versus granting property rights. Formalization of ASM is a logical step through developing private property rights which will enable responsible governance and the assist governments curb tax evasion, smuggling and illicit trade of gold

The theory of property rights has been subjected to significant criticism. Barnes point out that "internal inconsistencies within economic approaches might result in lower efficiency rather

[418] H De Soto & Harry P. Diaz 'The mystery of capital. Why capitalism triumphs in the West and fails everywhere else' (2002) 27 *Canadian Journal of Latin American & Caribbean Studies* 172.
[419] Ibid.
[420] H De Soto & Harry P. Diaz 'The mystery of capital. Why capitalism triumphs in the West and fails everywhere else' (2002) 27 *Canadian Journal of Latin American & Caribbean Studies* 172.
[421] E P Stringham 'Kaldor-Hicks efficiency and the problem of central planning (2001) 4 *Quarterly Journal of Austrian Economics* 41-50.

than the use of private property".[422] Therefore, ownership of property might be criticized when it does not turn into effective employment of resources.

Critical to note, is that,

> "formalization is not only concerned with whether there are legal, regulatory and policy frameworks in place that legalize ASM, allow for the purchase of a license, manage and regulate activities, but, the extent to which such laws and regulations are successfully activated, implemented, and enforced by the relevant authorities is also central to the formalization process".[423]

This requires a multidisciplinary and integrated property rights regime of small governments to implement and enforce formalization.

2.3 Conclusion

Over the last twenty years, ASM activities in South Africa have grown remarkably. This growth has been attributed to several factors, namely, structural adjustments due to fluctuations of the mineral prices, economic reforms that have resulted in many jobs being lost as well as inevitable liberal forces. The literature on ASGM has suggested that it can be characterized as a livelihood activity that falls under different types. It has been shown that ASM can be a sustainable livelihood strategy if it is formalized even if it is associated with negative externalities. The thrust of this section was also to highlight several thematic issues raised by a variety of scholars regarding ASM. Lastly the focus was on the literature relating to the calls to formalization and different approaches to effect formalization of ASM. The next chapter outlines the research methodology for the empirical and legal components of the research.

[422] Barnes (note 415 above).
[423] McQuilken & Hilson (note 409 above).

Chapter 3

Research Design and Methodology

3.1 Restatement of Purpose and Aim of Study

This study addresses the negative perception of Artisanal and Small-scale Gold Mining (ASGM) and a failure to see any connection between this sector and livelihood strategies. The research examines the contribution of ASGM to livelihoods to inform the development of a more facilitative regulatory framework that will regulate the access and right to usage of livelihood assets. The research questions look at: what appropriate conceptual framework for understanding ASGM and livelihoods is; how ASGM is contributing to the livelihoods of four wards in Roodepoort; how the law is currently facilitating or impeding AGSM as a livelihood strategy and how the sector can be regulated. The purpose of the study is to reframe ASGM as a livelihood strategy for the purpose of governance and regulation. The study seeks to develop a conceptual framework to understand ASGM and livelihoods. It also seeks to present and analyze empirical data to reframe ASGM.

The purpose of this chapter is to outline the research methodology for the empirical component of the research. The chapter explains the research approach and design, explains how the data gathering was planned, executed, and then analyzed and how data quality was safeguarded. In brief, the empirical research relies on a qualitative methodology, and an explorative, interpretive and descriptive case study that is analyzed through qualitative techniques and influenced by naturalistic theory, where the research is done in a natural setting.[424] The study employed semi-structured interviews and a detailed desktop examination of the ASGM legal framework. This chapter also outlines the methodological issues arising from the need to analyze the legislation in a grounded way.

The succeeding sections of this chapter will state and expand on the theoretical and philosophical underpinnings, assumptions and biases identified during the research. The research design will concentrate on the strategies and methodologies chosen to best extract the thematic data to be analyzed to formulate findings. The final section is dedicated to addressing

[424] H J Streubert & D Carpenter *Qualitative research in nursing* 3 ed (2003) *363*.

concerns in relation to credibility, generalizability and reliability of the study. The chapter also deals with the issue of inherent prejudice and bias on the part of the researcher.

3.2 Research Paradigm

A paradigm is critical to establishing a research position and grouping similar literary and philosophical perspectives through the recognition of patterns, academic ideas, and assumptions.[425] A paradigm is a world view.[426] This suggests that each researcher will undertake research with a mixture of philosophical assumptions and standpoints that will at times dovetail and will sometimes conflict. Three features of a research paradigm that are going to be of focus consist of assumptions about the nature of knowledge, methodology, and the principles and standards for validity. According to Guba, a research paradigm is simply a "set of beliefs or assumptions that guides a researcher's inquiry".[427] The research paradigms informing this study are critical social science theory and an interpretivism paradigm.

3.2.1 Critical Social Science Theory

Critical social science theory is linked with the Institute for Social Research, established by Adorno *et al*. It is exclusively directed by the study of Habermas and Freire, who claimed that "liberation is thus childbirth, and a painful one".[428] Carr and Kemmis, define critical social science theory as a system that allows participants in a research project to become investigators in the social action being studied.[429] It seeks to reflect on the way power, exploitation, control and inequity are both endorsed, resisted and reproduced within social and political realms.[430] Thus, the critical science experts attempt to understand, unearth and resist social disparity.[431]

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[425] M E Olsen, D G Lodwick & R E Dunlop *Viewing the World Ecologically* (1992) 16.
[426] T S Rocco, L A Bliss, S Gallagher & A Pérez-Prado 'Taking the next step: Mixed methods taking the next step: Mixed methods research in organizational systems research in organizational systems' (2003) 21 *Information Technology, Learning, and Performance Journal* 19-29, last accessed from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.122.1050&rep=rep1&type=pdf on 21 April 2020 20.
[427] E G Guba 'The Paradigm Dialog' (1990) 17.
[428] P Freire *Pedagogy of the Oppressed* (1968), last accessed from http://la.utexas.edu/users/hcleaver/330T/350kPEEFreireCh01table.pdf on 21 April 2020 4.
[429] W Carr & S Kemmis Becoming *Critical Education: knowledge and action research* (1986) 149.
[430] T A Van Dijk *Discourse and Power* (2008).
[431] Ibid.

The research can be separated into three indivisibly interconnected concepts: Ontology, epistemology and methodology.[432] The researcher's ontological views are about the nature of reality on the social phenomena within the global context, the nature of reality in terms of its legal status, changing nature and how it is constructed by research participants.[433] Ontology reflects the researcher's personal views, beliefs and link to the subject matter, as this may have an impact on the method selected.[434]

Realism in critical social science research paradigm is defined within a political, social, historical, cultural and economic setting. Ontology goes on to embraces the notion that there are multiplicities of standpoints with respect to emancipating and transforming various social actualities, but that these standpoints need be positioned within the correct value systems to understand the basis for the variances.[435] Therefore, it is critical to contextualize the reality according to its setting, characterization and background.

The study focuses on individuals who are desperately in need of an income to survive and have adopted ASGM as a livelihood strategy to achieve this nature of reality. The activity is unlawfully conducted as it circumvents several laws such as mining licensing, immigration, occupational health and safety and environmental management and poses a great risk to the miners themselves, the community and the environment. Furthermore, it affects the natural social order because it is conducted informally. This reality is constantly changing in that many people are being attracted to engage in ASGM due to numerous push and pull factors. Thus, the researcher's personal views are anchored in the fact that the reality can be constructed by the research participants themselves. The study has adopted an empirical approach to understand how the sector is characterized, contributes to livelihoods, how the law impedes the sector and how it can be formalized.

Linked to ontology is epistemology which is the fundamental roadmap that researchers undergo in their quest for the truth.[436] Epistemologically, critical social science researchers focus on the relationship between research participants and researcher. The interaction thereof facilitates for participants to relate historical and other socio-economic factors around their livelihood

[432] L W Neuman *Social research method* (2000).
[433] J W Creswell *Quality inquiry and research design: Choosing among five traditions* (1998) 76.
[434] N K Denzin and Yvonna S Lincoln *Introduction: Entering the field of qualitative research* (1994).
[435] D M Mertens *Mixed Methods and the Politics of Human Research* (2008).
[436] A S De Vos et al. *Research at grass roots: For the social sciences and human services professions* (2002) 214.

activities and how they impact them.[437] It is held that knowledge develops therefore; researchers and participants require inculcating trust and understanding to present their views accurately and fairly.[438] Knowledge is based in the interaction between research participants and that a condition for that knowledge to emerge is the trust and understanding that must be nurtured in that setting.

Critical social science seeks to alert to policy makers to the status quo of the participants in question and raise awareness on how they are dominated, discriminated, abused and side-lined.[439] Action is more important than discovery.[440] The real agenda for critical researchers is to transform lives and conditions of the oppressed. Critical social science theory operates from a perspective that is emancipatory, concerned with changing situations and building a better world.[441]

The study fits into the critical social science paradigm because the researcher established a relationship with the research participants to facilitate trust throughout all interactions. This practice allowed knowledge, such as exploitative social order and fundamental sensitive viewpoints to be discovered. The researcher ensured that trust was gained by seeking consent and assuring the participants that an accurate and fair presentation of viewpoints was critical towards ASGM conceptualization in South Africa. This approach positioned the researcher as a mouthpiece of the lives, experiences and challenges of the miners.

Lastly, methodology describes a logical set of methods aimed at reflecting the research question and that fit the researcher's purpose.[442] The study adopted complementary methodological choices of the critical social science paradigm, including purposive sampling, semi-structured interviews, observations, in-depth analysis and document analysis as a procedure and plan to acquire knowledge. These methods were selected to operationalize the exploratory and descriptive nature of the study to reflect on the experiences of the miners.

[437] Mertens (note 435 above).
[438] Ibid.
[439] J Edge & K Richards 'May I see your warrant, please?: Justifying outcomes in qualitative research' (1998) 19 *Applied linguistics* 334-356.
[440]Ibid 335.
[441] Carr & Kemmis (note 429 above) 149.
[442] E Henning, W Van Rensburg & B Smit *Finding your way in qualitative research* (2004) 36.

3.2.2 Interpretivist Paradigm

Mackenzie and Knipe categorize paradigms as "positivist (post-positivist), constructivist, interpretivist, transformative, emancipatory, critical, pragmatic and deconstructivist".[443] In addition to the critical social science paradigm, this study draws on interpretivism.

Interpretivism is characterized as "antipositivistic, voluntaristic and ideographic, using subjective first-hand knowledge".[444] Under an interpretivist approach, researchers try to understand 'the world of human experience'.[445] An interpretive paradigm seeks to garner individual perspectives as a yardstick towards understanding the world. Moreover, the paradigm's purpose seeks to contextualize people and situations as well as to affirm that there is no single precise route to knowledge and that reality is socially constructed.[446]

Interpretive researchers believe that reality comprises of people's independent encounters and experiences and that it is therefore socially constructed.[447] The paradigm focuses more on the individual experiences and human sense making than relying on external dependent and independent values.[448] Interpretivism aims to expound the root causes behind a social action subjectively.

Interpretivism draws upon both hermeneutics and phenomenology, which establish the underlying philosophical orientation.[449] Hermeneutical or interpretive phenomenology focuses on deducing the implication in a particular situation that is hidden, and thus not instantaneously revealed to direct inquiry, investigation and explanation.[450] The researcher attempts to understand "the whole through grasping its parts, and comprehending the meaning of the parts

[443] N Mackenzie & Sally Knipe 'Research dilemmas: Paradigms, methods and methodology' (2006) 16 *Issues in educational research* 193-205.
[444] J H Milam 'The presence of paradigms in the core higher education journal literature (1991) 32 *Research in Higher Education* 651-668.
[445] L Cohen, L Manion & K. Morrison *Educational research methodology* (1994) 36.
[446] Jerry W Willis and Muktha Jost, Foundations *of qualitative research: Interpretive and critical approaches* (2004) 4.
[447] G Walsham *Interpreting Information Systems in Organizations* (2015).
[448] J A Maxwell *Qualitative Research Design: An Interactive Approach* 2 ed (2012).
[449] R Boland 'Phenomenology: A Preferred Approach to Research in Information Systems' in E. Mumford et al. *Research Methods in Information Systems* (1985) 193.
[450] I Holloway *Qualitative Research in Health Care* (2005) 128.

divining the whole".[451] Phenomenology on the other hand, "aims to describe a person's lived experiences (phenomena) in an attempt to enrich lived experience by drawing out its meaning".[452] Phenomenological research looks at personal reality manifested by particular individuals in a given phenomenon through observation and interviews.[453] Phenomenology is also an inductive and descriptive research technique. By employing an investigative, descriptive, explorative and contextual design in line with a phenomenological approach, the researcher aimed to describe the experiences of ASGM miners as they are lived. The approach has enabled the researcher to explore the subjective reasons that lie behind ASGM, the miners themselves and the law.

3.3 Research Design

A research design is conceptualized as a blueprint for a given study on how data is collected.[454] In other words, research design provides an overall framework for answering the research question. For that reason, it is viewed by McMillan and Schumacher "as a plan for selecting subjects, research sites, and data collection procedures to answer the research question(s)".[455] Research design connects the research strategy and the research questions, thus one could regard it as a strategic action plan.[456]

The purpose of this study is to investigate the underlying contributions of ASGM to sustainable livelihoods, how miners access and utilize assets, and how these assets are mediated by law. The study seeks to establish how long participants have been ASGM miners and how they conceptualize their activity. The study also aims to expound on the assets ASGM miners use while conducting their livelihoods. Lastly, the study purposes to elucidate the informal rules that miners may have developed themselves to regulate access to particular assets, along with their experiences of the formal rules. A case study approach was utilized to answer specific research questions and canvas a multiplicity of perspectives rooted in a particular context.[457]

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[451] M Crotty *The Foundations of Social Science Research* (1998) 92.
[452] I Holloway *Qualitative Research in Health Care* (2005) 47.
[453] R W Barnes, John W Grove & N H. Burns 'Experimental assessment of factors affecting transfer length' (2003) 100 *Structural Journal* 740-748.
[454] G J Leedy *Method of making a tester surface with high density probe points*. (1997) 195.
[455] J H MacMillan & S Schumacher *Descriptive Statistics. Research in Education: A Conceptual Introduction*, (2001) 166.
[456] K Durrheim & J Dixon 'Attitudes in the fiber of everyday life: The discourse of racial evaluation and the lived experience of desegregation' (2004) 59 *American Psychologist* 626.
[457] J Ritchie et al. *Qualitative Research Practice: A Guide for Social Science Students and Researchers* (2013).

A case study can be defined as an empirical examination that examines an existing condition within its everyday context, aiming to understand the social context by analyzing their actions.[458]

This research can be considered as an instrumental case study as the purpose of the case study "is not to represent the world, but to represent the case", as the case epitomizes other cases and demonstrates a specific characteristic or problem. Although only ten interviews were undertaken, they represented how ASGM was undertaken and how miners regarded the law. Therefore, it cannot be said that this is an exhaustive process, but rather that it should paint a picture as to what the issues are and gain a sharpened appreciation of the nature of ASGM.[459] The case study methodology seems the most suitable approach as it provided detailed data of the participants and distinct viewpoints of the research questions.[460]

Though the gathering of data in an exploratory case study can be less organized than in more structured enquiries, the extent of the structure becomes important. Unstructured or in-depth interviews, frequently encompass a comprehensive scope, yet they can be dedicated and focused through questioning and probing.[461] The interviews involved ten artisanal miners in four wards that is 70, 84,127 and128 in the Roodepoort district, attempting to unearth the essence of ASGM, law, assets and sustainable livelihood priorities in the case study areas. From these transcribed interviews, the themes or issues were identified and extracted and selected patterns of findings were formulated, using systematic data reduction (including extensive coding, categorization and literature review) of data management and analysis.[462]

It has been established that social life is dynamic and ever-changing, hence May contends that since social lives are not fixed, experiences of the participants transforms to and therefore it is justifiable for the researcher to be part of their life so that appropriate interpretations are reached.[463] Thus the researcher became part of the environment for the total of 20 hours to understand particular actions, behaviors and customs of miners. A thorough empirical research informs one to appreciate underlying beliefs and values that holds and guides the community

[458] R K Yin Case *study research, design and methods* 3 ed (2003).
[459] D M Mertens 'Qualitative methods Research Methods in Education and Psychology: Integrating Diversity with Quantitative and Qualitative Approaches' (1998) *Sage Publications*159-187.
[460] Yin (note 458 above).
[461] J Lewis & J Ritchie 'Generalising from qualitative research' (2003) 2 *Qualitative research practice: A guide for social science students and researchers* 347-362.
[462] Yin (note 458 above) 440.
[463] T May *Social Research: Issues, Methods and Process* 3rd Edition (2001).

during all its operations. Thus, this enabled the researcher to understand the challenges, uncertainties that surround the sector as well as the need for reforming the law.[464]

3.4 Methodological Issues

In this study, methodology is the discussion of methods, how the research was completed and its logical order. The major focus of this study was to explore and describe the experiences of artisanal miners in attaining a livelihood. The research method is a technique of inquiry, which moves from the basic suppositions to research design, data gathering and analysis,[465] explaining the nature of representations and generalizations resulting from the data.[466] A critically important consideration involves the legal study, desktop study, fieldwork process and criteria of case study selection which appropriately informs the context. Access, sample size, methodological limitations and consent procedures also need to be considered to inform the trustworthiness of the study.

3.4.1 Legal Research

As the study sought to examine how law mediates the activity and assets of ASGM miners, it was necessary to engage in legal research. Barken *et* al, define legal research as:

> The process of identifying and retrieving information necessary to support legal decision-making. In its broadest sense, legal research includes each step of a course of action that begins with an analysis of the facts of a problem and concludes with the application and communication of the results of the investigation.[467]

In legal research it is imperative to identify the scope of legal question to categorize the study within the appropriate jurisdiction, relevant law and relevant time period. In the case of this study, the appropriate jurisdiction was South Africa, the relevant law was informed by both the activity of and assets associated with ASGM, and the relevant time period was law currently in force.

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[464] Buxton (note 56 above).
[465] D G Myers 'Using new interactive media to enhance the teaching of psychology (and other disciplines) in developing countries' (2009) 4 *Perspectives on psychological science* 99-100.
[466] K Charmaz *Constructing grounded theory: A practical guide through qualitative analysis* (2006).
[467] S M Barkan, B Bintliff & M Whisner *Fundamentals of Legal Research* 10 ed (2015).

In engaging with the relevant law, the researcher adopted the five-step process popularized by Fitzgerald: FILAC, which stands for (Facts, Issues, Law, Application and Conclusion).[468] These stages are logical and help to analyze the problem as well as reducing the risk of overlooking issues and important facts.

The researcher conducted interviews and observed ASGM participants to determine what happens in their work in terms of what they do, who is involved, how they are involved, and where and when they conduct their work. The researcher identified the facts and issues which arose from the fieldwork process that highlighted several relevant laws. Through LexisNexis, an electronic legal research site, the researcher managed to track the legislation that speaks to the livelihood assets and the general practice of ASGM such as minerals, environment, land, water and so forth. This exercise enabled the researcher to identify the necessary facts to determine which laws were relevant. This exercise led the researcher to appreciate several primary sources that include legislative enactments, opinions of the judiciary and regulations and decisions of administrative agencies.

Relevant issues that emanate from the facts were identified. These include ASGM contribution to livelihoods, the use of a variety of assets in an endeavor to attain livelihood outcomes, how the law impedes the sector, ways that the sector can be formalized, personal and community risks and illegal immigration. The issues that were raised affects the types of resources to be consulted, information to be gathered as well as the jurisdiction to be covered.

In addition to primary legal sources, the study relied on a variety of secondary legal sources: Legal articles, textbooks, and law journals such as the Artisanal Mining Report, a publication of the Legal Resource Centre, International Comparative Legal Guide to Mining Law[469] and The Mining Law Review[470] gave a viewpoint on how particular issues with ASGM fit into a broader legal context. Secondary sources have persuasive authority and are not mandatory or

[468] M Fitzgerald *Legal Problem Solving: Reasoning, Research & Writing* 5 ed (2010).
[469] The International Comparative Legal Guide to: Mining Law (2017), last accessed from https://www.werksmans.com/wp-content/uploads/2013/05/ML17_Chapter-26_South-Africa.pdf on 20 April 2020.
[470] E Hayes & J Cloete The Mining Law Review South Africa 8 Edition *The Law Reviewers* October 2019, last accessed from https://thelawreviews.co.uk/edition/the-mining-law-review-edition-8/1209380/south-africa on 20 April 2020.

binding on the courts.[471] The researcher also consulted with the Legal Resource Centre and the Department of Mineral Resources to gain a perspective on how the law relates to ASGM.

Following the identification of relevant primary and secondary sources, the study examined how the legal principles and rules apply to the facts of the case to answer the research questions.

3.4.2 Participant Selection

This study aimed to uncover the influence of ASGM on livelihoods, to explicate the assets miners use, and to elucidate informal rules developed to regulate access to particular assets, along with miners' experience of the formal rules.[472]

The essential processes of the empirical component of the research entailed observing, investigating, documenting, and ultimately interpreting the unique experiences of individuals involved in ASGM. The criteria used to select these case areas included a variety of characteristics, including the immense informality, environmental, humanitarian and developmental pressure and the multitude of sensitivities. The research focused, more specifically, on mining activities on abandoned and disused mines through a semi-structured interview process.

The criteria used for interview selection ensured that the participants were in fact artisanal miners. The researcher determined this through the physical identification of miners who were undertaking the activity. They were selected through purposive sampling. Purposive sampling through snowballing allows one to choose key and relevant participants to respond in detail to the research questions.[473] Secondly, it was important that participants understand the context of the informal rules in identified case study areas, and finally, that the interviewees have specific knowledge of the issues that is present within the case study areas.

3.4.2.1 Sample Size and Access

[471] The Writing Center 'When and how to use secondary sources and persuasive authority to research and write legal documents' (Georgetown University Law Center 2004).
[472] E Babbie *The Practice of Social Research* (2004) 183.
[473] S B Merriam *Qualitative Research in Practice. Examples for Discussion and Analysis* (2002).

The whole population of ASGM miners could not be included in the study. It was therefore necessary to sample a portion of the population.[474] According to Saunders, Lewis & Thornhill, a sample size is a representation of the whole populace of the study.[475] The credibility and precision of research results are influenced by sample size. Generalizability of the study would need a large sample, which has a propensity to diminish error and yield more credible and accurate conclusions. The sample size was small in that only 10 interviews were conducted during the study. The researcher's proposal initially aimed to interview 80, but that at the defense he was specifically asked to scale it down due to risks associated with ASGM. The researcher agreed with the recommendation to reduce the sample size because the purpose of the interviews was to help to understand ASGM only insofar as it enabled the researcher to identify the relevant laws. The involvement of Dr. David van Wyk and the Benchmarks Foundation enabled the researcher to meet with the miners and gather sufficient information about the nature of ASGM activity, composition, livelihood assets, different mining sites and how miner's view formalization of ASGM. Due to limited financial and human resources, a small sample size was appropriate. The researcher spoke erratically with some community members but, concentrated effort was put on the participants to respond effectively to the questions asked. Furthermore, the present study sample size was small because the population that houses the sample is not known. However, there was consistency of the population characteristics under inquiry and a small sample did not need more resources and time to access it.

The field interview was a joint venture between the researcher and respondents, though the focus was on the miner's perspectives and experience on the contribution of artisanal mining to household livelihoods. Interviews took place at the mining sites to reduce inconvenience and encourage the facilitation of a comfortable environment. The duration of the interviews averaged approximately two and a half to three hours.

3.4.2.2 Interview Process

A semi-structured interview technique was adopted throughout this study to extract the most usable and valuable information. Semi-structured interviews as types of qualitative interviews can be "thematic, topic centered, biographical or narrative" The technique adopted used both

[474] N Burns & S K Grove *The practice of nursing research, conduct, critique, and utilization* (2001).
[475] A Thornhill, M Saunders & Philip Lewis *Research methods for business students* 5 ed (2009).

closed and open-ended questions and this method of interviewing enabled the researcher to incorporate interview questions that sought to understand submissions by the participants.

To ensure consistency, each participant was asked a set of predetermined set questions, such that the same areas were covered with each participant. As the interview progressed, the interviewee was given an opportunity to elaborate or provide more relevant information. Each interviewee was informed about the purpose of the research, research questions data gathering techniques, and extent of the study prior to the start of each meeting.

The researcher assured the interviewees that they would remain anonymous as they become afraid when answering questions that sounded difficult and personal during the interview process. Audio recordings were used to ensure that all information was captured besides writing down the information, and consent for the audio recordings was obtained.

The interviewing process presented some challenges. Amongst these were issues such language barrier, detailed transcription of data, fear and suspicion, miner's level of literacy and untruthful answers. During the interview process, the miners were not articulate as they used colloquial speech to refer to their tools and other items. As data was written, some important information was not captured as it was narrated, because it did not make sense at first. However, when the researcher was coding the data, audio recordings became useful to assist on uncaptured textual data. Most miners were suspicious and fearful of imminent arrest. The interview process was oftentimes disturbed by police raids. The use of local languages assisted the researcher to obtain detailed information. Interviews were subjected to answering contextual questions. This abetted the researcher to garner valuable information as some responses given were untruthful. For example, reasons for undertaking ASGM as a livelihood strategy and its sustainability. Fortunately, one managed to further probe what the researcher assumed as a false assertion by affording interviewees to elaborate. For example, how miners' social networks with the buyers, elites in the political and security spheres have enabled them to survive and how rules were enforced.

The main data gathering technique employed in the study was informed by Charmaz's notion of "an intensive, open-ended, semi-structured qualitative interview".[476] The research interview

[476] Charmaz (note 466 above) 33.

process connected well with the research purpose that aims to explore ASGM as livelihood strategy and elucidate assets and informal rules used in conducting ASGM mining operations.

3.4.3 Desktop Research

Desktop research is the process whereby a researcher makes use of already existing data or information, often called secondary data analysis.[477] Desktop research enabled the researcher to prepare for field research. The desktop research included journal articles, reports from the Department of Mineral Resources, the IIED, the World Bank, databases such as LexisNexis, books, the google scholar search engine and newspapers.

The desktop research was conducted by selecting key words from the problem statement and theoretical framework of the research. Information that was relevant to the research problem was selected. However, one of the shortcomings of this process was that some information was out of date, biased, and incomplete or did not precisely fit to the research problem for instance most discussions did not focus on ASGM governance and regulation. It was important to take into cognizance the credibility and reliability of the source and relying on data from credible research institutions.

3.5 Data Collection and Transcription

The data collection process outlined above produced notes, audio-recordings and written observations. The data collection period from the interviews extended from 23 February 2018 to 15 April 2018 and resulted in 10 transcripts. The completed interview transcriptions are kept on the researcher's external hard drive.

To capture data both manual transcription and digital recording devices were utilized. There were, however, some instances where digital recording was not used, as people expressed discomfort with having their voices recorded. Nevertheless, almost three quarters of interview data was captured by digital recorders. Most of the interviewing was carried out in the isiZulu, Sesotho and Shona, which the researcher speaks fluently. The method of operation, thus

[477] L Zhou & M B Nunes 'Formulating a Framework for Desktop Research in Chinese Information Systems Handbook of Research on Innovations in Information Retrieval, Analysis, and Management' (IGI Global, 2016) 307-325.

consisted of reading the notes and then listening to the audio-recording, as soon as possible after it had occurred and then assessing whether each portion was worthy of recording as an excerpt. The great advantage of personal transcription was an intimate familiarity with the content of the data. The qualitative data are in the form of interview transcripts transcribed during the engagement with interviewees. The transcripts were transcribed from written notes into electronic documents before the analysis phase.

3.6 Consent and Permissions

This being a qualitative study, there was significant interpersonal interaction with the study participants and thus personal and private domains of values, assumptions, concerns, and politics were entered.[478] The researcher considered it essential to establish a relationship of trust with the participants, and to respect them as independent beings.[479] There are several issues that researchers should take on board when collecting and analyzing data, including risk and harm to participants, access and consent, trust and honesty, privacy and confidentiality, advocacy and legality,[480] and finally social sensitivity.[481] Hence, applicable steps were taken to adhere to strict ethical guidelines in order to maintain participants' privacy, confidentiality, the right to pull out from the study, dignity, rights, and anonymity.

As a requirement, ethical clearance with the university was sought, from the University Ethics Committee for Non-Medical Research before any formal engagement was initiated. To this end the researcher submitted a detailed proposal setting out the substance of the proposed research together with annexes that included a participant information sheet, formal consent form, and the procedure for obtaining consent. The University Ethics Committee for Non-Medical Research considered the proposal and granted clearance to proceed with the study, judging that no negative impacts could flow from the engagements and complying with all the data gathering techniques suggested without imposing any conditions. The Ethics Clearance Certificate Protocol Number is: H17/11/08. Interviews were conducted in isiZulu, Sesotho and Shona. The application included a request for an audio recording device during interviews.

[478] D Silverman *Doing qualitative research: A practical handbook* (2000) 201.
[479] Ibid.
[480] M Miles & M Huberman Qualitative *Data Analysis* (1994).
[481] Silverman (note 478 above) 201.

3.6.1 Confidentiality and anonymity

At the beginning of each interview, the researcher provided the participant information sheet detailing the purpose of the research, research strategy, data gathering techniques and the assurance that their contributions and inputs were confidential. The identity of the participants remained confidential to encourage candid exchange between the interviewer and interviewee. The names of participants are not mentioned and were dealt with in the strictest confidence. Additionally, all audio files generated have been destroyed after the research had been completed. All files were kept secure using a password to guarantee confidentiality.

3.6.2 The right to withdraw from the study

The respondents were, from the beginning, informed about the research and their right to stop or withdraw at any time, should they feel uncomfortable. Again, the respondents were given a thorough explanation of their right to pull out of the interview process, prior to the interview.[482]

The researcher further elaborated that the entire study was for academic purposes only and their involvement in it was entirely voluntary. The researcher guaranteed the participants that their trust would not be misused for personal gain or advantage, by misleading them to participate in the study.[483] It was only when permission was granted that the researcher progressed to the mine sites and commenced carrying out interviews.

Consideration was given to existing vulnerabilities. These included, health risks, lack of access to social and medical amenities, susceptibility to imminent arrest, lack of proper identity documentation as well as inability to identify that they were vulnerable. The researcher stopped the interview process and was sometimes forced to resume later, due to occasions of possible raids, distress and discomfort.

The researcher approached the local councillor for Ward 70 (Florida, Consolidated Main Reef Gold Mine, Rand leases Gold Mine) and the Roodepoort Police Station for permission to interview the miners, and this was granted. Introductions with the miners were also facilitated

[482] Merriam (note 473 above).
[483] S Lubbe 'Development of a case study methodology in the information technology (IT) field in South Africa: a step-by-step approach' (2003) 5 *South African journal of information management* 41.

by Dr David van Wyk of the Benchmarks Foundation, a non-profit and faith-based organization in Corporate Social Responsibility (CSR), with a history of Consolidated Main Reef Gold Mine and Rand leases Gold Mine also directly engaged with miners on the Westrand. The researcher assured participants that their participation would not expose them to police arrest or reprisals.

3.7 Data Analysis

Data analysis is a fundamental approach in research that entails organization of the research findings for the purposes of interpretation.[484] The researcher undertook this process to search and derive meaning by analyzing the qualitative data actively. Observed experiences and reports from the participants were interpreted by identifying patterns, concepts, themes and meanings which may enlighten or ascertain causal relationships in the database.[485]

Data analysis for this study commenced after conducting the interviews. Thematic content analysis was employed to analyze all the data collected. This analysis method consisted of five steps that are: "transcription, checking and editing, analysis and interpretation, and verification".[486]

To help make sense of the findings, themes were identified as the data were being transcribed. From the beginning of the fieldwork, the coding exercise was conducted by organizing interview transcripts, field notes and observations[487] to construct descriptions of the case study. These narratives formed the basis for the data reduction through coding and the subsequent analysis and interpretation. These emerging themes were identified following a thorough examination of the data, in line with the study's objectives. The analysis also involved identifying a variety of laws and texts from data sources that contained information about topics central to the research. These steps were followed to ensure that the analytical process was systematic and not rigid.

[484] Miles & Huberman (note 480 above).
[485] D F Polit, C T Beck & B Hungler *Essentials of nursing research: Methods, appraisal and utilization* (2001) 383.
[486] S Sarantakos *Varieties of Social Research*. In *Social Research* (1998).
[487] Miles & Huberman (note 480 above).

The researcher began the actual analysis of data by reading the entire data set. A thorough reading exercise was conducted to immerse oneself in the content transcribed. A researcher must engage himself in the data, to attain familiarity and understanding of the data and a logic of the whole. This is done to safeguard the distinctiveness of each participant's lived experience, although allowing an appreciation of the settings and conditions under study. It began by paying attention to the participants' accounts, followed by reading again and reviewing the verbatim records.[488] Fundamental to note, is the connection of identifying central themes towards a comprehensive description.[489] During this process, study meanings were derived and articulated from transcribed accounts and then grouped into themes to provide adequate significance of the experience.

The researcher was the only investigator who intermingled and interacted with all the research participants, thus enabling him to absorb the changing participant truth. The subsequent analysis of the information gathered formed a contingent reorganization from the numerous realisms that happened at the time the data was gathered.

Reliability, Generality and Credibility

In any research, there is potential for bias. A case study such as the one the researcher adopted is no exception. As Bulmer and Warwick point out, "a frequent criticism of case-study research, for example, is that its reliability is low since so much depends on the capacity and personality of the observer".[490] Fundamental to the approach of interpretivist constructivism and in particular grounded theory is trust, credibility and validity. Credibility is arguably the most collective term used in qualitative research as a measure of the quality of research, in terms of the extent to which the data and data analysis are accurate, plausible and trustworthy.

Positioning the Researcher

Qualitative research methodology entails those meanings about people's way of life and their experiences are better derived through a social inquiry of the world they live in.[491] The

[488] Henning, Van Rensburg & Smit (note 442 above) 127.
[489] Ibid.
[490] M Bulmer & D P Warwick *Social research in developing countries: Surveys and censuses in the Third World* (1993) 10.
[491] I Holloway & S Wheeler *Qualitative research in nursing* (2002).

researcher used the qualitative research methodology to explore the behaviour, views, experiences, and state of minds of miners and accentuate the understanding of these elements. It is generally understood that when conducting qualitative research, there will be an inherent bias, particularly where the researcher is collecting and interpreting data individually. As Denzin & Lincoln indicate, "qualitative research implies an emphasis on the qualities of entities and on processes and meanings that are not experimentally examined or measured".[492] This exists due to the strong subjective component of a qualitative study which undeniably influences the final research product. The researcher and the findings are therefore inseparably linked, yet this does not diminish the credibility of the research. Rather, it can add valuable dimensions to the findings as long as the predispositions, inspirations, interests or viewpoints of the investigator are stated and expounded transparently.[493] Formal legal research does not ordinarily involve an analysis of subjective biases as the research is often predominantly concerned with legally supported reasoning and opinions, yet due to the qualitative nature of this study, a more appropriate social science influenced approach is adopted in order to augment the credibility of the research.[494]

The researcher is a Disaster Management and Human Resources professional who focused on Corporate Social Responsibility (CSR) during his undergraduate studies. He then went on to study drought adaptation strategies during his post-graduate studies. Currently, he is focused on understanding artisanal gold mining as a livelihood strategy. The researcher's education and training up until this point has been focused on humanitarian, development and environmental science. The Researcher has worked with Oxfam GB, a humanitarian organization for a period of two years, firstly as a Program Officer then as a Monitoring and Evaluation Officer.

The study has taught the researcher that people find themselves surrounded with a vulnerable context due to shocks and trends. To ensure an income, food security and well-being demands they adopt a sustainable livelihood to cope and adapt within such a context. To achieve a sustainable livelihood, one has to have access to assets which are moderated by law and politics. Thus, power is central to all oppressive acts and those who have it will usually exercise this power at the expense of those who do not. The law is also intertwined with one's emotions. The law has numerous limitations, yet one remains hopeful of its potential to improve the status

[492] N K Denzin and YS Lincoln Handbook of *Qualitative research* (2005) 10.
[493] Y S Lincoln & E G Guba *Naturalistic inquiry* (1985) 290.
[494] J A Maxwell *Qualitative Research Design: An Interactive Approach* 2 ed (2012) 5.

of artisanal mining in South Africa which operates outside the law and sustainable livelihoods. The researcher is abundantly aware of a 'justice seeking' mentality; an approach soaked in leftist ideology that believes that there is a certain kind of good linked with law and conceivably blinds one to others.[495] The researcher has therefore made a conscious effort to pull himself from the left towards the centre and be more unprejudiced in the interpretation of the data and the presentation of the resultant findings.

Since the completion of a (BSc Hons) in Human Resource Management the researcher was involved in a variety of projects with several civil society organizations, most of which relied on community engagement as a central evidentiary collection method, employing both qualitative and quantitative research methodologies. His MSc degree in Disaster Management involved a certain amount of participant engagement, where a study was done on the lived reality of drought adaptation strategies of rural folks in the Midlands province of Zimbabwe.

The researcher's intention was to uncover the issues that emerge through the voices of those operating as artisanal miners, to provide a grounded approach to the analysis of the law. This doctoral study has significantly built on his existing knowledge and has constantly challenged him to refine the research processes. This experience has reaffirmed faith in law as a practical tool in the pursuit of justice and redressing lawlessness and inequality yet made him more aware of the need for a clear, organized, integrated and responsive legal regime.

Dependability/ Reliability

According to Polit et al, dependability refers to the data constancy of data and over circumstances.[496] Dependability denotes to the "extent to which research findings can be replicated with similar subjects in a similar context".[497] A dependable study should be accurate and reliable.[498] According to Holloway, dependability relates to the consistency of results.[499]

[495] J Rockey 'Who is Left-wing and Who Just Thinks They Are?' (Working Paper Department of Economics, University of Leicester 2014).
[496] D F Polit *Statistics and Data Analysis for Nursing Research* (2013).
[497] K Moon et al. 'A guideline to improve qualitative social science publishing in ecology and conservation journals' (2016) 21 *Ecology and Society* 17
[498] N Golafshani 'Understanding Reliability and Validity in Qualitative Research' (2003) 8 *The Qualitative Report* 597-606.
[499] Ibid.

In other words, dependability ensures that if the research is repeated with different participants with the same content, the results will be consistent. However, it is difficult to reach the same conclusion because human behavior varies and is always affected by different factors.

The nature of interpretations also varies from one person to another based on individual life experiences together with the researcher's ability and capacity to gather and analyze the information. In qualitative research, reliability can be tested by juxta-positioning research findings with the data gathered to ensure consistency. The researcher adopted several ways to ensure consistency, such as explaining the fundamental assumptions and concepts as well as the use of various data gathering methods. The main risk to effective account was imprecision or incompleteness of the data. This was basically resolved by the audio recordings.

Transferability

Transferability refers to the likelihood that the study results are significant and have meanings to others in related circumstances. Research findings can be applied in new settings and contexts, however generalizability and transferability in qualitative research is a challenge due to small sample size and the subjectivity of the researcher as the key instrument. Nevertheless, the researcher, enhanced generalizability by categorizing the research methods, situations, backgrounds and assumptions underlying the study.

Member checking

Lincoln & Guba submit that "the member check, whereby data, analytical categories, interpretations and conclusions are tested by members of those stake-holding groups from whom the data were originally collected, is the most crucial technique for establishing credibility".[500] The researcher ensured that that the participants had experience and knowledge of mining by asking demographic and background questions. Furthermore, the process of snowballing enabled the researcher to be referred to other participants who were involved in ASGM.

The researcher conducted member checks with the respondents' reaction continuously by summarizing to them the information that was shared to either affirm or reject the information.

[500] Lincoln & Guba (note 493 above) 314

Member checking is a method that is used to improve reliability by restating information given by the interviewee to determine accurateness. It was done during the interview to allow the interviewee to either uphold that the sum-ups mirror their views and realities, or that they do not reflect these experiences.[501] This enhanced applicability that is the prospect that the results have the similar implication for other miners.

Credibility

Credibility in qualitative research is defined "as the extent to which the data and data analysis are believable and is corresponding to internal validity, that is, how research findings match reality".[502] In order to address questions of credibility and increase the possibility that reliable outcomes will be produced, the researcher employed methods of prolonged engagement, triangulation, member checks and persistent observation.

Prolonged engagement

Prolonged engagement entails a style of building trust and learning the culture of the participants by allocating enough time.[503] It is vital, for that reason that the researcher devotes sufficient time getting accurate information about the phenomenon. Prolonged engagement similarly demands that the researcher be involved with a site long enough to identify and take into account misrepresentations and misinformation that might then slink into the data. The researcher drew attention of many miners and community members because he was unfamiliar. Prolonged engagement is one of the approaches that increased credibility of this study. An average of 90 to 120 minutes was spent with each participant to cultivate a trusting relationship with them during all engagements and interactions and member checks.

Persistent observation

Persistent observation was a critical step that enabled the researcher to pinpoint those features and components that were related to the research purpose. To fulfil this standard of credibility, the researcher cautiously observed the participants' behavior during their working. The physical presence of the researcher in the area assisted the researcher to discern the transactions

[501] E Chase 'Enhanced member checks: Reflections and insights from a participant-researcher collaboration (2017) 22 *The Qualitative Report* 2689-2703.
[502] L Talbot *Principles and practice of nursing research* (1995) at 529.
[503] Lincoln & Guba (note 493 above) 302.

and the interaction they have with their activities. The researcher observed the miners' attitudes, commitment, and knowledge of their activities from preparation to entry into the shaft and when processing their ores.

Reflexivity

The researcher was involved in the entire research process and was not detached from the proceedings of the study to understand and appreciate the phenomenon under study. Objectivity was encouraged by exploring individual experiences and feelings which had a potential impact to the research findings. The researcher explored personal experiences and feelings that might impact the study and integrated this understanding into the study to encourage objectivity.[504] The researcher kept a diary to record the events, experiences and views expressed by the miners. The examination of the researcher's experience made the researcher mindful of potential prejudices and predetermined ideas. Bracketing, a method which mitigate deleterious assumptions and beliefs was as applied throughout the study to assist the researcher to approach the circumstances and describe the phenomenon with an open mind.

Triangulation

This refers to the employment of numerous techniques and referents to draw conclusions and to encompass data from diverse sources, various methods of gathering data and diverse researchers.[505] The employment of triangulation enabled the researcher to attempt to differentiate accurate information. Therefore, the researcher checked in with experts from the DMR regarding the department's position on ASGM. The literature review was conducted to acquaint oneself with the information on the research under study, and data was collected by means of a semi-structured interviews to get detailed and comprehensive data concerning the miners' view on how ASGM was contributing to their livelihoods.

3.8 Challenges and Limitations of the Research

The research raised expectations on the part of the miners. Initially, many believed that the researcher had come to buy minerals or would connect them to international buyers. However, once it was clarified that the research was a part of a PhD project at the University of the

[504] N Burns & S K Grove *The practice of nursing research, conduct, critique, and utilization* (2001).
[505] W Robson *Strategic management and information systems: an integrated approach* (1997) 404.

Witwatersrand, a handful were reluctant to participate in the study. For some, there was scepticism about whether the researcher was sent by the government to establish who was mining illegally; however, these concerns were somewhat alleviated by repeated visits (and no subsequent government or police response to suggest that this was happening), and promises to interviewees that they would remain anonymous.

Another problem faced was physical access to mining sites when interviews were carried out, there were often several interruptions, as most of the interviewees had to attend to other issues at the same time. But in cases where it proved difficult to focus or the interview was disrupted, a second interview was arranged.

Inaccessibility of some mining sites, specifically due to denial by armed guards, meant that the researcher was incapable to visit other mining sites within the wards. It remains unknown if several other sites were visited would have changed the outcomes of the study.

3.9 Summary

The methodology and design of any study that secures its acceptability as academic work. This chapter outlined the methodological approach taken to address the aims of this research. It has defined the research paradigm, research methodologies, and data gathering methods, ethical considerations, data analysis and credibility. In a nutshell, the research design for this study was a descriptive, explorative and an interpretive case study that was analyzed mostly through qualitative methods. The credibility of the research was anchored in multiple insights namely, desktop survey of literature and legal frameworks, a case study, prolonged interviews, and persistent observations. The research being qualitative, the analysis of data was conducted thematically, and it allowed the researcher to appreciate the settings distinctly, the experiences authentically and connecting themes to the research questions.

The next chapter discusses the empirical research findings, and the chapter thereafter reports the findings of the legal analysis. The critical integration of the research findings and literature review is central in reflecting the theoretical and the practical potency of the study as academic work that has policy relevance in South Africa.

Chapter 4

Case Study: ASGM in Wards 84, 70, 127 and 128, Roodepoort, South Africa

This chapter presents the empirical findings from the fieldwork that will guide the recommendations for the regulatory framework in South Africa. The fieldwork was focused on Roodepoort, an area in the west of Johannesburg, which has several derelicts, closed, abandoned and operational gold mines. The study area has varied geographical features and uneven development, ranging from formal housing and commercial assets to informal settlements. It is in the latter where ASGM takes place. As Jinnah *et al* observed: "the entrances to informal mining shafts are hidden from public view in verges and mine dumps, and located in informal areas that are associated with violent crime, including rape, murder and robberies".[506] The findings in this chapter are presented in line with the broad divisions of the literature review, namely a focus on the characterization of ASGM, including its negative externalities; the reframing of ASGM as a livelihood activity; and considerations relevant to the formalization of ASGM in this area.

4.1 ASGM Characterization

4.1.1 Profile of the study area

Artisanal gold mining in the Westrand regions is characterized by high concentrations of ASGM populations. The study looks at 4 wards, namely Rooderpoort Durban Deep Ward 84, Rand Leases Gold Mine and Consolidated Main Reef Gold Mine (Florida) in Ward 70, Sol Plaatje and Matholesville Ward 127, and Braamfischerville Ward 128. The wards are shown in Figure 4.1 below.

[506] Jinnah (note 506 above) 2.

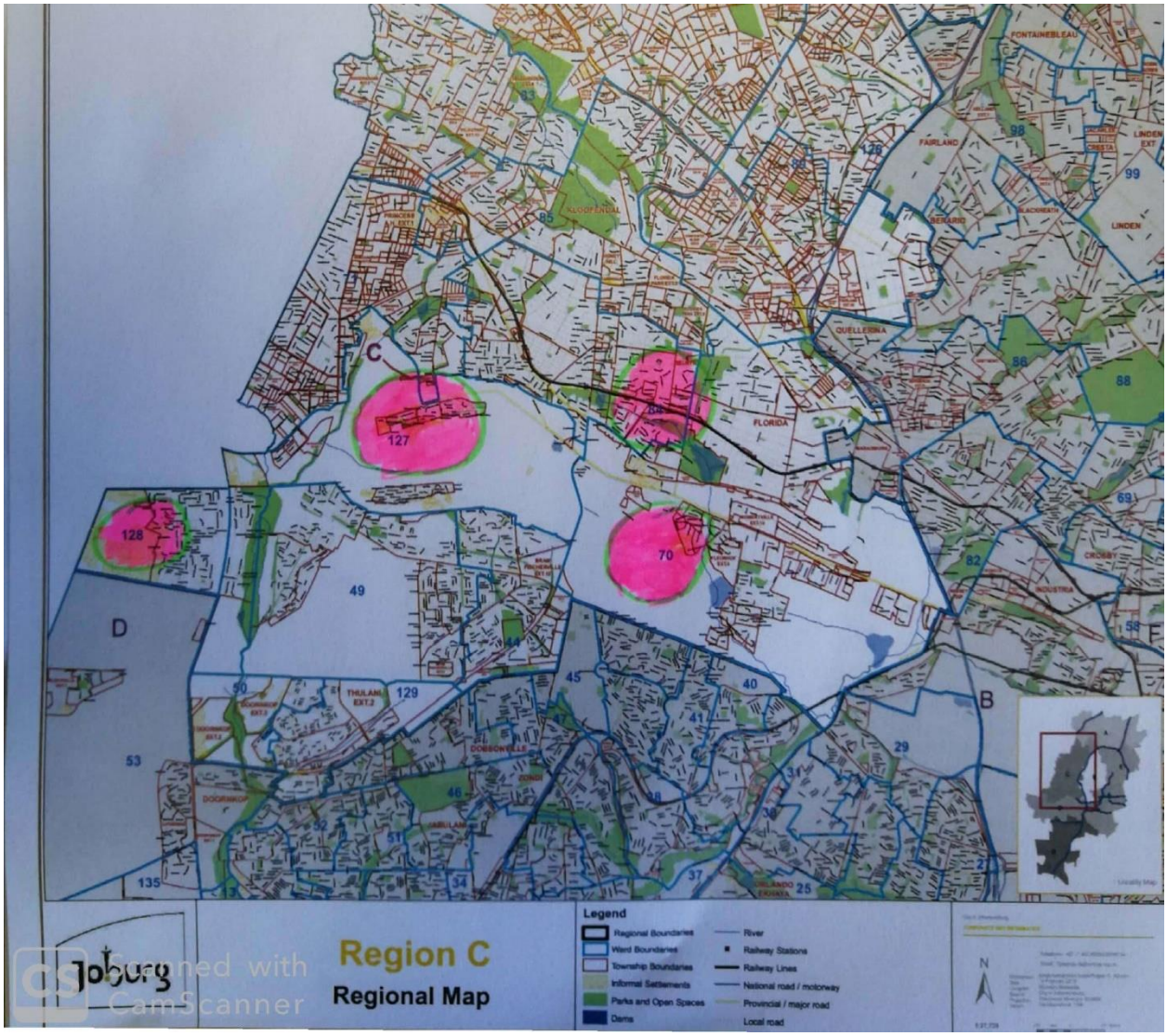


Figure 4.1 Artisanal gold mining wards and research locations, Region C Johannesburg *(Source: Municipal Demarcation Board (2009))*

While the credibility of statistical data at the grassroots level is low,[507] earlier studies[508] and my research indicate a number of interrelated socioeconomic problems in this area. These issues consist of the nonexistence of basic services such as water and electricity; lack of medical, education, and recreational facilities; and safety and security issues. It is imperative to indicate that in these wards, there is high unemployment, informal employment, poverty,

[507] Ibid.
[508] Ledwaba (note 54 above).
Note 504 above, last accessed from http://www.mahpsa.org/wp-content/uploads/2017/05/SEAM-ASM-report-FINAL.pdf on 26 April 2020.

corruption, informal rules exercised by the elites, environmental degradation and lack of access to markets and finance.

4.1.2 Profile of the study sample

For purposes of the research, ten individual miners were identified for interviews through a process of snowball-sampling (see Chapter 3 for an overview of ethical considerations). Nine out of ten of the participants were males and one female. African cultures still hold that men have the obligation to work and provide for the family. The researcher observed that women mostly work on the surface, crushing, ground sluicing[509] or selling food and other commodities to miners.[510] Since women have a responsibility of childcare, most women conduct their work with children alongside them. The female respondent indicated that some women take part in sexual relations to obtain a supply of rocks to crush. It is also believed that prohibition of women to work underground is motivated by spiritual beliefs that associate their participation with bad luck that might lead to death or injury.[511] There is also a cultural belief that women are not strong enough to dig for the minerals. Their operations are thus limited to conveying the gold-bearing material to the processing point or plants for processing. However, women in artisanal mining have been gradually affirming their independence.[512]

These claims were affirmed in the fieldwork. The researcher observed several women rolling homemade grinding mills and crushing or grinding the stones on concrete slabs, some with children on their back while some were selling food and alcohol. The female participant was a widow (with two school going children) and an example of a female miner 'increasingly affirming her independence'. She was involved in crushing gold ore like most women. She mentioned that she was working with men who she called 'amacontacts' who supplied her with work, that is, with ore to crush. She was sometimes also responsible for washing gold and using mercury to trap gold. This was the role of the one female participant in the study. Payment was mostly in cash (ZAR 100 per bucket of gold ore) and sometimes in kind through the gold

[509] Ground sluicing is a technique or process where water is used to wash down the material containing gold. The process allows gold to be trapped at the bottom separating it from the lighter gravel or sand material which is washed away through gravity separation.
[510] R Thornton 'Zama-zama, Illegal: artisanal miners, misrepresented by the South African Press and Government' (2014) 1 *The Extractive Industries and* Society 127-129.
[511] Ibid.
[512] J Cooper 'Why we should foster Economic Independence for Women in Artisanal and Small-scale Mining' *International Institute for Sustainable Development* 8 March 2018.

bearing-material. The participant would partake in piece jobs in and around the residential areas, like any other crusher when work was not available. The activity of women in the wards studied was mainly restricted to household-related activities, and they were not allowed to enter the mine shaft. In addition to feeding the family members and looking after children, they engaged with ASGM on the margins by crushing the gold ore. Male participants had strong social beliefs and customs governing gender and sexual roles. Most male participants mentioned that women were not permitted to enter into the mining shaft because they are vulnerable to criminality and they run the risk of being raped. They also mentioned having women underground would lead to misfortune that would lead to injury or death.

The age of the participants ranged from 18 to 50 years, with the majority (seven out of ten) in the age cohort of 31-50 years. This aligns with characterizations of ASGM as a labor-intensive activity, requiring a degree of age-related physical fitness (see Figure 4.2 below). The female participant fell within the 41 to 50-year cohort.

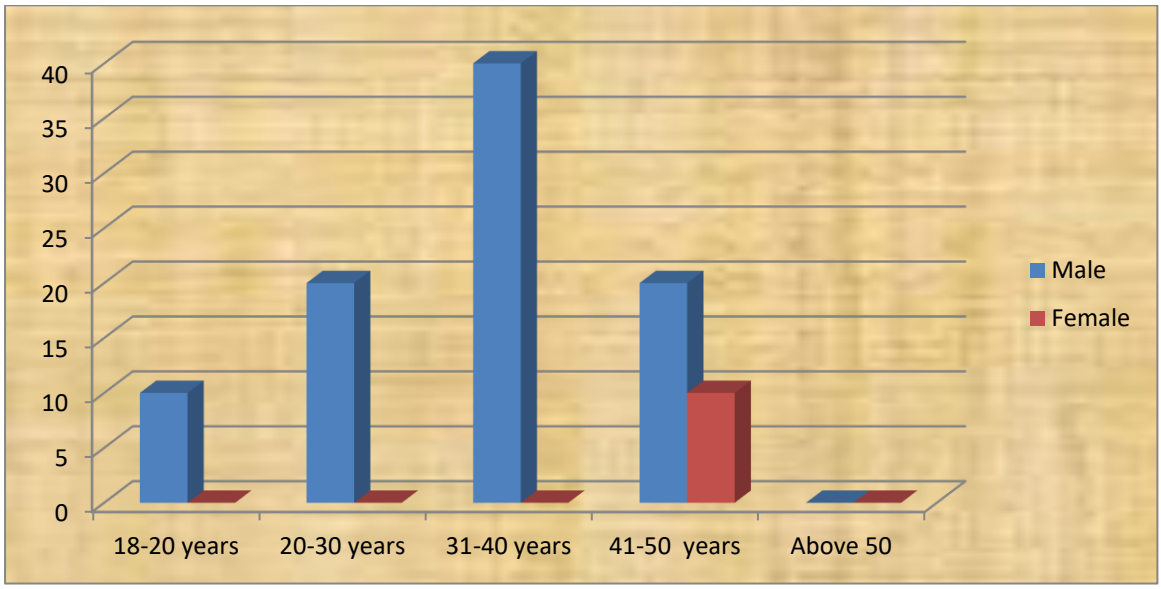


Figure 4.2 Age of Respondents by Sex (*Source: Roodepoort Field Survey February- April, 2018)*

Nine out of ten of the participants came from neighboring countries: Six from Zimbabwe and three from Lesotho. Out of six respondents from Zimbabwe, four where Shona speakers and two were Ndebele. The fieldwork process was conducted without any language barrier as the researcher is fluent in both Zimbabwean spoken languages and isiZulu. Most of the participants

had worked in mining (as gold panners) while some had a history in informal mining. Eight out of ten participants in the study were undocumented migrants and had no capacity to obtain work permits.

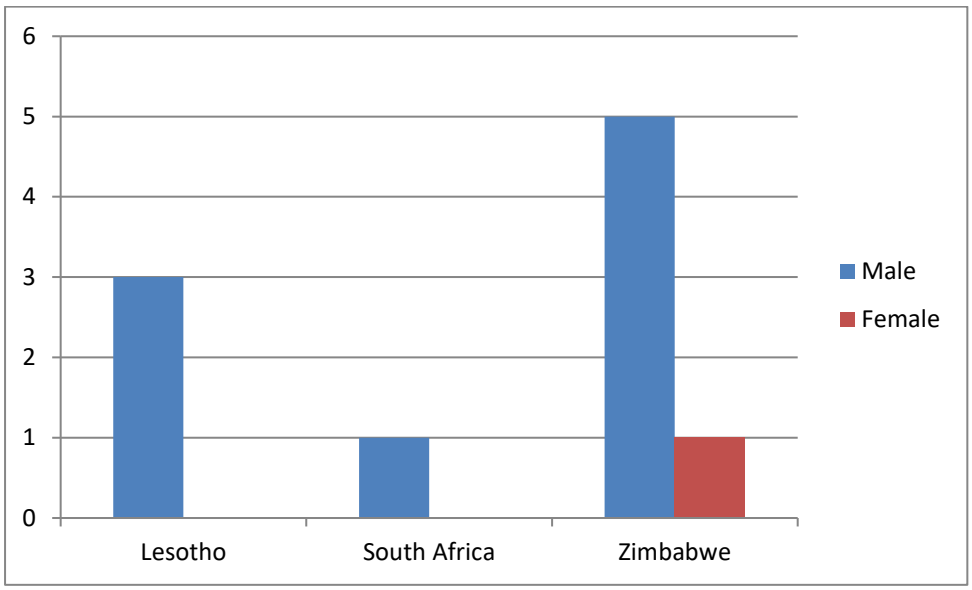


Figure 4.2. Distribution of miners by origin *(Source: Roodepoort Field Survey February-April, 2018)*

The ethnic origin enables one to understand the socio-economic and cultural backgrounds of the miners. Moreover, it also gives an indication of their access to strategic assets within the community.

Although nine out of ten participants were citizens of neighboring countries, they had remained in the study area for a significant time. Six out of ten of the miners had been living in their respective communities for over 10 years, and the remaining four between one and five years. This indicates increasing inter-regional integration of both cultural and economic diversities. Staying at a place over a long period of time helps build trust, social cohesion and the necessary social networks that underpin the social capital of an individual. The researcher identified that the popular belief regarding migrants in mining communities marrying local people was true. One participant indicated that he married a South African woman. The participants further mentioned that several other miners were cohabiting with local people and subsequently becoming part of the social network of these communities. Trust can be understood as a positive anticipation, or confidence concerning the other party's conduct and may sometimes arise from repeated interpersonal cooperation and collaboration which is enabled by the long period of

stay in a specific area.[513] Through a lengthy stay in an area, an individual acquires the general knowledge about the population of agents, the incentives they have, and the upbringing they have received. This in turn builds trust in the resident and in the people around him or her, thereby creating a depth of asset to fall on in times of need and stress. The result is the creation of enabling economic agents that operate more efficiently for instance, by invoicing for goods they have delivered or by agreeing to stop hostilities[514] or buying goods on credit in times of difficulty. To this end, respondents in the various mining communities may possess a great deal of social capital. This makes community resource mobilization and mutual help probable as trust would have been consolidated. In a sense, it would seem more likely that social trust is a key factor for enhancing individual well-being as well as socioeconomic development at the community level.

The findings of the study amongst the participants showed that the size of households in the mining communities ranged in the middle of one and five. The average household size was three. Eight out of ten of the respondents had household sizes of between two and five, while two participants had no children and were between the ages of 18-20. Households with larger sizes stand in a position to develop greater social capital, as there is an extended network of interaction and knowledge sharing. Several studies have revealed an interesting relationship between family sizes and social capital.[515]

The level of education, related qualifications and skills held by miners gives a valuable signals and suggestions of, and about the type of people who work in the sector. A typical ASGM site would comprise individuals with a range of educational and skills background, illuminating how economic reforms and other structural adjustment programs have affected poverty-stricken parts of sub-Saharan Africa.[516] All of the participants had some form of formal education. Six out of ten participants had completed secondary education, while four had completed tertiary levels of education: Two had diploma qualification (in agriculture) and the other two had certificates (in administration and logistics). It can be suggested that education was forfeited at the expense of providing for the family, especially by the young people who

[513] M Fafchamps & B Minten 'Returns to social network capital among traders' (2002) 54 *Oxford economic papers* 173-206.
[514] Ibid.
[515] A Ullah Khan *et al.* 'Social Capital – An Eclectic Literature Survey' (Aequitas Consulting 2018), last accessed from https://docs.wbcsd.org/2018/09/Social_Capital-An_eclectic_literature_survey.pdf on 26 April 2020 at 7.
[516] Hilson & Potter (note 19 above) 103.

were the heads of their households. Since educational capital is essential for the physical, social and economic development of the household, to some extent, the participants with only secondary education had limited opportunities to reduce their present and future socioeconomic vulnerability, which is a significant factor in livelihood empowerment and sustainable poverty reduction. This resonates with what Mutemeri and Petersen submitted, that lack of skills excludes miners from connecting and networking with different stakeholders in marketing and technology.[517]

In addition to their lack of highly technical skills, the researcher observed that most of the respondents also lacked basic technical skills that could enable them to get employment in lower occupational levels in large-scale mining companies such as forklift and crane driving skills.

With five out of the ten participants being married, the researcher puts forward that social forces and cultural values identifies marriage as fundamental institution of a progressive society. Marriages provide a right of entry or access to groups (nuclear and extended family) resources, with the outcome being enhanced economic rewards and social power. Social network focuses on family and group relationships that have the potential of generating resources through family structures.[518] This potential could therefore be effectually tapped to help attain sustainable livelihoods in the community. People who are not married may perhaps also have appreciable levels of responsibilities to members of the extended family, particularly if they engaged in some economic activities. Of the household heads that were married, the majority were within the 20-30 age cohort with the least being within the 18-20 and 41-50 age groups. Excluding the 31-40 age group, the number of married people in the various wards remained evenly distributed more than those who were not married. This means that, in each ward, there was a married participant arguably motivated to engage in ASGM to provide for the family.

4.1.3 Characterization of ASGM activity

As explained earlier, ASGM is generally understood to be a low-tech, labor-intensive mineral extraction and processing operation.[519] It is characterized by the employment of manual labor

[517] Mutemeri & Petersen (note above 50).
[518] P Bourdieu & L JD Wacquant *An invitation to reflexive sociology (*1992).
[519] Hilson & Potter (note 238 above).

to mine minerals from underground, open pits or riverbanks.[520] The fieldwork confirmed that ASGM within the study area was practiced extensively as an informal, subsistence, poverty driven activity and was labor intensive (with no capital investment). The researcher also observed that ASGM as a sole economic activity was detrimental to social, health and environmental impacts. Furthermore, within the study area, the ASGM was characterized by unregulated mining methods, area and duration, with no finance or technological support and that a substantial section of the sector's operations is illegal.[521] This normally has effects on labor productivity and local economic growth since the labor force would lack the inventive capacity to enhance the economy, and promote the adoption of new knowledge and technologies.[522] This is believed to have direct impact on the types of livelihoods in the area, particularly in increasing the human capital inherent in the labor force of the community.

The observed and the reported work of the miners confirms that ASGM is labor intensive and subsistent. There was a consensus from the participants that the activity was arduous. The miners said to deal and cope with being hot going underground, they strip down their clothes. They mentioned that they use their headlamps together with manual tools (chisel and hammer) and their makeshift sacks which they use to collect the gold ores. Miners indicated that they work in small sets or groups of four or six. Being in groups also helps them when they work in areas where aeration was poor, where some miners will remain in upper shafts where the oxygen source was good, holding onto a hose pipe for others to breath in deeper shafts.

It was observed that ASGM activity in the Westrand is characterized by a rudimentary process (with the use of traditional tools) to extract gold from underground excavations along the rich mineralized tunnels within the pits. The participants mentioned that the actors were simply: the miners, surface workers responsible for crushing and processing the ore, buyers, and sponsors. Related players comprise a family, police, health care workers who support the miners in respectable ways and are also responsible for rescue and recovery operations.

[520] K Hayes 'Small-scale Mining in Africa - A Case for Sustainable Livelihood' Regional Workshop: Common Fund for Commodities 2008.
[521] Hoadley & Limpitlaw (note 194 above).
[522] Impact of technology on labour market outcomes (World Trade Report 2017), last accessed from https://www.wto.org/english/res_e/booksp_e/wtr17-3_e.pdf on 27 April 2020 3.

Upon the surface, the researcher, witnessed three tasks: crushing of ore in (Sol Plaatje and Matholesville Ward 127 with the use of old gas cylinders,[523] (see below pictures), sluicing (washing of the soil) and the amalgamation of gold particles using mercury. The researcher was told that the final process of burning the mercury from the gold amalgam was performed at their private homes. This undertaking confirms that ASGM is an informal and a lowly mechanized activity with no support structures and institutions such as technical and financial support. The researcher observed that the activity was labor intensive and negatively impacted the health of the women as the process of crushing and grinding the rocks led to cracked hands and knees as shown in Figure 4.4 below. The photo also suggests that they are exposed to silica dust (inhalation), so silicosis development might be an issue. Moreover, the female participant mentioned that the work demanded that they be exposed to the long and short-wave radiation of the sun. The finding confirmed that ASGM is a labor intensive activity that has the propensity to cause harm to the body in general.







[523] Old gas cylinders are homemade manually driven mills useful for crushing gold bearing ores.

Figure 4.4 Homemade manually driven mill (Crusher) (*Source: Roodepoort Field Survey February- April, 2018 and Janet Munakamwe*[524]*)*

It was detected that the operations were illegal because relevant laws were being violated. To begin, although detailed analysis is discussed in Chapter 5, the activity was not defined and regulated by the MPRDA and other related laws in terms of duration, size and duration, or level of investment like how ASM is defined by other countries such as Ghana and Tanzania. The legal status confirms that the undertaking was illegal and informal. Furthermore, the livelihood assets such as gold as a precious mineral, water and the environment are also ring-fenced by law. The existence of the criminal syndicates as indicated by the miners reinforced the earlier assertion that the operations are marred with illegality. The miners were very quick to indicate their operation were organized by seen and unseen syndicates who included strangers undercover within the community, relatives, ethnic and factions belonging to fellow countrymen. After being asked about their role, the participants mentioned that they oversaw work arrangements, security guards, supply of tools and work equipment, food and were responsible for liaising with customers.

The participants said that they are driven to engage in ASGM by poverty. They also indicated that there had no other alternative for an income, hence they were conducting ASGM as a livelihood strategy. For the period of the research, the gold was being sold to buyers for between ZAR400 to ZAR500 a gram. This was half the official[525] gold prize in South Africa. It further shows how exploitative the nature of transactions was and how desperate the miners were to acquire an income. The miners said that the gold after being sold informally to traders, it is then directly traded with local permit holders. This will be the 3rd Tier (local syndicates/ bulk buyers) as posited by the South African Human Rights Commission as Illegal mining levels.[526]

ASGM in South Africa has been characterized as an informal, illegal and poverty driven activity. The following subsection delves into the negative externalities identified during the fieldwork.

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[524] Jinnah (note 506 above).
[525] Gold Price Chart (South Africa) https://goldprice.org/gold-price-south-africa.html
[526] J Love 'A report of the SAHRC Investigative Hearing; Issues and Challenges in relation to Unregulated Artisanal Underground and Surface Mining Activities in South Africa' (2014). Refer to the diagram in chapter 2 on page 77 (note 330 above).

4.1.4 Negative Externalities of AGSM

Chapter 2 outlined the categories of negative externalities associated with ASGM. In the study area, negative impacts included pollution of water sources, spread of diseases, conflicts (turf wars), mercury pollution, dust pollution, land degradation, child labor, mine accidents, illegality, prostitution and gender discrimination. The presentation of these findings sheds more light on how ASGM is characterized in South Africa.

Pollution of water sources

The researcher observed that municipal water was used in some instances during the processing stage. In some cases, water containers as large as 20 litres were used to carry water that was used to wash the gold. In other occasions, water was fetched from rivers, disused wells and stagnant waters. The use of water by the miners was illegal because they did not hold the water license and have no lawful access under permissible water use and general authorizations to water use as mandated by the National Water Act Schedule 1 and section 39 respectively. The researcher observed miners discarding water polluted with heavy metals like mercury into the same water sources (see Figure 4.5 below). These findings show how the ecosystem becomes a death trap to both human beings and animals as the researcher observed children playing in the same water sources.[527] ASGM undertakings are not supervised by water authorities to ensure sustainable use and management of water, but this is needed as the miners' operations pose a serious threat to aquatic life and consequently to humans.



[527] Aryee, Ntibery & Atorkui (note 145 above) 133.

Figure 4.5 Washer[528] **and the disposal of polluted water** (*Source: Roodepoort Field Survey February- April, 2018)*

Spread of diseases

The participants admitted that the spread of diseases has resulted mainly due to sociocultural decay, population growth and criminality. Several health workers were seen in and around the area of Sol Plaatje (Ward 70) running campaigns on sexually transmitted diseases, distributing contraceptives, and running mobile clinics. The researcher noticed that due to the transitory nature of ASGM, short term gains are capitalized at the expense of long-term sustainable goals. Several participants emphasized that due to lack of proper care and poor sanitation, sexually transmitted, communicable, and waterborne diseases such as HIV/ AIDS, diarrhoea, influenza, tuberculosis (TB), bilharzia and malaria, are widespread.

Conflicts

Decay of sociocultural values paves the way for criminal activities to surge. In the study area deaths have resulted from turf wars. Mbuzukongira pinpointed earlier in chapter 2 that illegal mining is a source of conflicts for different groups in countries such as the DRC and South Sudan.[529] One participant said that miners have grouped themselves according to their nationality. These groups are of the Basotho and the Zimbabweans. These have marked their areas of operations underground and have their markets (sponsors) as well as security guards. Thus, conflicts are unavoidable. The participant and some other community members mentioned that gunshots are regularly heard. Actual and perceived results in these violent turf wars have a negative impact on how the activity is generally perceived. On the other hand, regardless of the negative impacts that the activity has on individuals and the community, miners regard ASGM as a livelihood activity.

Mercury pollution

The researcher witnessed the rampant use of mercury. It is an environmentally hazardous metal to air, land and water. Miners rely on mercury to recover gold either from ore or from

[528] Washer is a colloquial term referring to the ground sluice used for recovering the gold from ore.
[529] M Mbuzukongira 'Occupational radiation exposures of artisans mining columbite–tantalite in the eastern Democratic Republic of Congo' (2007) 27 *Journal of Radiological Protection* 187.

concentrate using a process called amalgamation. Amalgamation is a process by which mercury added to material with free particles of gold binds physically only with gold to the exclusion of the other waste minerals in the material, forming a "gold-mercury" mixture called an amalgam. To recuperate the gold from the mixture, the miners heat it usually on an exposed fire, the mercury vaporizes, and gold remains. Participants indicated that the use of mercury is widespread in the sector in question because it is cheap and readily available. Miners showed that are aware of the health risk associated with mercury use but pointed out that it was the only substance that is cheap and convenient to their practice.

Miners and the surrounding communities are at risk from mercury exposure. The researcher witnessed miners physically in contact with mercury with their hands without protective gear as they squeezed the excess mercury during the amalgamation process (See Figure 4.6 below). There is no doubt that particles of this heavy metal are sometimes swallowed, inhaled, or absorbed through the skin. Miners are conscious of the fact that they misuse mercury for immediate gain resulting in respiratory diseases and in the long run affect unborn babies. Some of the risk identified include neurological effects such as vision changes, muscle weakness and nerve loss in hands and face.



Figure 4.6 Miner in physical contact with mercury *Source: Roodepoort Field Survey February- April, 2018)*

Dust pollution

The researcher observed that wind-blown dust particles emerged from crushing sites that were in Ward 84 (Rooderpoort Durban Deep) towards residential areas. Tailings Stage Facilities

(TSFs) which have radioactive materials have also been the sources of dust pollution in Braamfischerville Ward 12. The participants were not concerned about wearing face masks to protect themselves from contracting respiratory diseases. An investment in education and training is paramount to assist miners appreciate the dangers of air pollution.

Land degradation

The researcher observed how ASGM activities were degrading land in the Westrand area. Illegal mining activities have destroyed the forest lands, road and housing infrastructure due to blasting vibrations and polluted the land. Trees have been cut down to provide for firewood. Soil erosion has been facilitated by deforestation as the soil is exposed to erosion by water and air leaving large gullies and reducing the productivity of land. Miners dispose of rubble inappropriately. Some of these piles of rubble are already contaminated with mercury and pose a risk to the community at large.

Child labor

The researcher observed children working directly and indirectly within the ASGM sites. School age-going children were seen loitering around the crushing sites, and some were seen partaking in crushing the stones. The participants said lack of money has led most children to accompany their parents to their places of work. Their view resonates with what Hentschel *et al* earlier mentioned regarding involvement of children in artisanal mining due to the lack of financial resources. Depriving children education is a breach of the right to basic education and an educational neglect which consequently forfeits their future opportunities for employment and therefore exposing many of them to become a source of cheap labor.

Mine accidents

Several participants indicated that they had witnessed deaths due to accidents such as rock falls, drowning and inhaling of toxic gases. However, due to the lack of alternative livelihood opportunities, miners opted to risk their lives and engage in ASGM. Miners highlighted that ignorance of risk factors is due to lack of education and guidance and knowledge about

mining.[530] Nevertheless, the researcher witnessed the miners putting on old, makeshift helmets, shoes, head torches, kneecaps as a safety measure (see Figure 4.7 below). The miners said that they understood that ASGM is often characterized as an activity where rampant accidents occur because of the absence of formalized practices to enforce health and safety related as well as standardized work practices. The situation is extremely dangerous. The miners identified that rock falls, turf wars, and gaseous explosions as some of the dangers that they are exposed to.



Figure 4.7 Artisanal miners preparing to enter into the mine shaft at Langlaate *Source: Roodepoort Field Survey February- April, 2018 and https://zwnews.com/matholeville-lesotho-mining-zama-zamas-were-not-killed-by-zimbabweans-sa-police/)*

Illegality

Due to the migratory nature of ASGM, new sets of values and norms have caused sociocultural disturbances. Participants mentioned that due to the different backgrounds of people engaged in mining coupled with the desire for fast wealth, immoral activities such as prostitution, money laundering, murder, theft, alcoholism and gender discrimination have flourished. Desperation has led to individuals participating in these acts to survive the hostile environment in which they work.

Gender discrimination

[530] Hentschel, Hruschka & Priester (note 154 above).

On gender discrimination, to begin with, women are not allowed to enter the shaft to extract the mineral. Their role is to crush the stones, cook and entertain the miners in kind. One miner pointed out that most women fight amongst themselves to get business from the miners, that is to crush the stones. The miner mentioned that the maximum that these women would get per day amounts to not more that ZAR 200. Increased exclusion, vulnerability and exploitation of women was rife as they were relegated to less paying roles.

4.2 ASGM as a livelihood activity

This section focuses on the study area through the lens of ASGM as a livelihood activity. In Chapter 2 the literature dealt with the different types of ASM, push and pull actors, whether it alleviates or exacerbates poverty, and the sustainable livelihoods framework. Therefore, the counterpart observations of the fieldwork process in this section will reflect upon what has been discussed earlier in the literature.

To begin with, it is notable that the participants were unanimous in regarding their activity as a livelihood. One of the shared reactions of the participants when asked about how they go about their work, was, "we are not stealing". They mentioned that it is a work involving individuals or groups of people who extract for minerals by means of basic tools. The participants admitted that their practice was a permanent livelihood strategy, but at the same time also seasonal, due to various factors that inhibit them to continuously partake in ASGM such as police raids and conflicts. All the participants depend on artisanal gold mining activities, to provide them with employment and income.

4.2.1 Push and pull factors

A lot of work on ASGM have submitted a number of reasons why individuals partake in the artisanal mining. These are deliberated as pull and push factors in Chapter Two. Despite the variety of reasons, a discussion of push/pull factors is led by two accounts. The first one is described as led by criminal syndicates[531] and the other characterizes the sector an activity that

[531] R Noetstaller *Small-scale mining: A review of the issues* The World Bank (1987).

is mainly poverty driven.[532] This sub-section, outlines the factors that motivated the participants engaging in ASGM in the Roodepoort area.

The most common factors that apparently drives ASGM, is the ease with which persons could come to be miners. As one participant put it:

> *What one needs is the physical strength and not capital. More importantly, anyone who aspired to be a miner must be prepared to become a member of the group/ community. New miners are often given tools to work with as a start-up to be settled in cash or kind.*

Most participants consider ASGM to be a livelihood opportunity. Only two miners in the study take part in ASGM because they want to hurriedly get rich. For most of the participants, therefore, ASGM is a livelihood of strategy, an undertaking that has merely turned out to be part of daily life.

The quotation above suggests that social capital is as important as the economic endowment miners bring to the activity. Social capital in the form of family networks, education, commonly shared rules, and other community mechanisms for enhancing access to opportunities seemed to be more important than economic or financial capital to a miner's success. Most participants regarded membership in a group or any other informal association as paramount to safeguard your life and work.

The Minerals Council of South Africa submits that there is a direct connection between informal mining and the retrenchment of mine employees. These ex-employees have a good idea of the process and knowledge of the disused mine infrastructure too.[533] Four out of the ten participants had been directly involved in mining in Zimbabwe prior to functioning as artisanal miners. Two of these were retrenched at Turk Mine in Bulawayo and the other two lost their contracts with Blanket Gold Mine in Gwanda. The participants from Lesotho indicated that they were involved in artisanal alluvial gold mining along rivers prior to coming to South Africa but were pushed into ASGM due to inadequate infrastructure and lack of finances.

[532] G Hilson 'Small-scale mining, poverty and economic development in sub-Saharan Africa: An overview' (2009) 34 *Resources Policy* 1-5.
[533] Mineral Council South Africa (2016).

All the participants echoed that they were motivated by the need to create self-employment to sustain themselves. The researcher noticed that due to overreliance on paid employment, retrenchments and the closure of mines have resulted in high unemployment. Moreover, the participants highlighted that food security has been threatened by climate change. Miners from Zimbabwe said that erratic rainfall has led to drought.

The male participants in the study said that they were pushed into ASGM because of customary factors. Being a man in the family attaches household duties of being a breadwinner. Due to this expectation, most males were driven to undertake mining to ensure that they satisfy the obligation to provide for the family.

However, the rising gold price also seemed to lure miners into ASGM. This resonates with what Hilson and Potter mentioned earlier on the increasing of the gold price and markets being the undeniable forces attracting many to partake in ASGM.[534] The miners said that they were selling their gold at a price between ZAR 400 to 500 per gram. The researcher observed that miners were forced to sell at this price due to demand of gold from the global markets as immediate buyers were always available to exploit the miners.

ASGM's speedy financial earnings, is a strong a belief held by the miners and has been an "attracting force for migrants from both within, and outside" the Westrand. The financial potential has attracted economically active miners who if not would have travelled out of the communities due to inadequate employment prospects. Nine out of ten participants indicated earning over ZAR 5000 per month and the 10th participant who was a woman earned an average of ZAR 2500 per month. This was an indication of the role that mining played in the livelihood decisions or choices of respondents.

The duration of a miner's stay in an area is indicative of whether the ASGM is migratory, seasonal or permanent. It is also relevant to the sustainability of the livelihood. People acquire assets at places where they live or intend to live for long periods. In the study area, age, place of birth, number of dependents, monthly income and occupation were factors influencing the length of a stay in an area.

[534] Hilson & Potter (note 238 above).

As shown in Table 4.1 below, eight of the ten participants had been operating and living in their communities for over 5 years. All the participants had been operating in a particular area for more than 2 years. The miners said that they had been operating for this long because of established networks, trust as well as lack of alternative source of livelihood. Based on the length of their operation, the researcher concludes that this is permanent ASGM.

Table 4.1 Duration of Operation by Age of Respondents, *Source Roodepoort Field Survey February- April, 2018.*

Age of the Respondent	**Duration of Operation**
18-20	2 years
20-30	5 years
20-30	6 years
31-40	9 years
31-40	4 years
31-40	6 years
31-40	8 years
41-50	8 years
41-50	11 years
41-50	7 years

The miners' lengthy stay, therefore, gives them the opportunity to have wider social networks. Moreover, it indicates that it is an ongoing and growing sector that can be considered as an important source of employment and livelihood, constituting a significant livelihood strategy for the urban poor.

4.2.2 Relationship to poverty: Exacerbation or alleviation?

This subsection looks at the key claims about the relationship between ASGM and poverty. ASGM has been adopted as a poverty alleviation strategy to generate income directly and indirectly. Community empowerment may flow from ASGM by increasing social and financial capital, employment opportunities, reducing poverty, and providing community and individual amenities such as the growth of local businesses, improved access to good health care and decent housing.[535] UNEP also adds that ASM has been a main source of income which increases the wealth of especially rural populations.[536] Other claims in relation to poverty suggest that ASGM extends poverty, because miners lack access to markets and financial assistance, lack a culture of saving, and are vulnerable to other hazards such as evictions, conflicts, loss of health and accidents.[537]

For the participants, ASGM provides employment and income. Mining was the main source of livelihood amongst the participants and, based on their testimony, in the host communities in which they operated, offering a mechanism for positive livelihood outcomes. For nine of the ten participants, ASGM was their main economic activity. The participants realized that the constant dependency on one source of livelihood could increase their vulnerability in times of price instabilities and seasonal imbalances. Findings from the study put forward that, proceeds on mining are spent in other income generating activities such as property, livestock and trading as participants have come to realize the unconventionality of the work, they are involved in. Other miners have invested in other jobs such as livestock management and selling mining-related items and this offers proof of the aspiration for diversification of livelihood strategies. The participants highlighted that they are also involved in other activities such as casual work and selling. However, ASGM emerged to be an activity or a strategy that was more dependable.

The perception of the host community indicates that mining has heightened the living standards of people around the community. The miners attributed this to the easy flow of money from one household to another as daily transaction were undertaken. For instance, eight out of ten indicated that they had increased social and financial capital. This shows that mining is a major alternative for income within the studied communities.

[535] Hentschel, Hruschka & Priester (note 154 above).
[536] UNEP and Indigenous Peoples: A Partnership in Caring for the Environment Policy Guidance November 2012, https://wedocs.unep.org/bitstream/handle/20.500.11822/11202/UNEP_Indigenous_Peoples_Policy_Guidance_endorsed_by_SMT_26_11_12.pdf?sequence=1&isAllowed=y on 26 April 2020.
[537] Bannock Consulting Ltd 'Vulnerability of Artisanal and Small-Scale Mining to Commodity Price Fluctuation' PAPER 3: Price and Other Risks in the Artisanal and Small-Scale Mining Industry (2006).

As noted above regarding the negative externalities of ASGM, mining has increased the vicious cycle of local inflation. Instead of uplifting the miner's wellbeing, the activity appears to be exacerbating poverty. Basic commodities were sold at a higher price, making it difficult for some to save and budget their income. Despite all other positive contributions, the negative impact of mining, particularly ASGM activities, raises a lot of concern about livelihood as well as financial, human, social and environmental sustainability.

The researcher noticed that miners were indifferent to or ignorant of saving. It was observed that money was spent on luxuries and recreational items such as alcohol. Some participants were intoxicated during the interview. Notwithstanding the substantial sum of money some miners were earning, they had the belief that money ought to be hurriedly spent to quickly earn it again. Several other beliefs held by the participants were that bad luck would associate those who did not spend the money. Some said that they were not able to save or budget their money because they did not have documentation to open bank accounts which led to the norm of spending money quickly. They also conveyed that gold was an infinite resource. However, many are relentlessly indebted to the so called 'informal loan sharks'. Therefore, this suggests that gold in not an infinite, secure source of income.

4.2.3 Applying a livelihoods frame

Several measures have been put in place at the global, national and local levels to ensure the sustainability of livelihoods in mining communities. From the study, although mining enables the inhabitants of host communities to have livelihoods and become economically empowered, it also presents critical issues of sustainability. The participants indicated that ASGM provides employment and income to household heads and members. However, they also highlighted the negative effects of mining on themselves and their environments such as water and air pollution, land degradation and mercury contamination. Despite the several measures put in place at the global, national and local levels to ensure the sustainability of livelihoods in mining communities, this is still a major concern for the government and other role players.

Mining plays a central role in employment creation at the local level. The sector is the major source of livelihood for several households. The livelihood support is both direct via direct

employment, through the production chain from mining through processing to buying, and indirectly through food vending at the mining sites and the sale of mining inputs.

A livelihood is sustainable if it resilient and could recover and cope from shocks.[538] Sustainable livelihoods entail making productive use of both tangible and intangible assets. The sustainable livelihood framework helps in understanding the livelihood strategies and their interaction with various policies and processes to achieve livelihood outcomes. The framework analyzes people's capabilities, activities, vulnerable context and assets while assessing dynamics that hinder the attainment of sustainable livelihoods.

In line with the sustainable livelihood framework, this section aims to explicate the assets ASGM miners use while conducting their livelihoods. Tangible and non-tangible resources include natural resources like minerals, land and water; social assets like community and family networks; social assets such as participation, empowerment and rights of access, education and training, knowledge and skills; physical assets such as equipment (explosives, mercury and processing plant); affordable, adequate and secure transportation, adequate water supply and sanitation, and clean, affordable energy; and economic/financial assets (markets, savings, credit).[539]

Natural capital

Miners are dependent on the availability of mineralized land for their livelihoods. Thus, these assets denote "the ability of a system to maintain productivity when subject to disturbing forces, whether a stress (a small, regular, predictable disturbance with cumulative effect) or a shock - a large infrequent, unpredictable disturbance with immediate impact."[540] Due to the fact that gold is a finite resource, depleting the existing stocks of gold, combined with the environmental destruction linked with ASGM, could end in a degeneration and deterioration in the level at which such lands produce other valuable outcomes for livelihoods.[541]

In the sustainable livelihoods framework natural capital implies the accrual of natural assets such as minerals, forests, land, water, wild resources, air quality, and biodiversity.[542] In the

[538] Chambers & Conway (note 244 above) 7.
[539] Krantz (note 243 above).
[540] CS Holling 'Investing in research for sustainability' (1993) 3 *Ecological applications* 553.
[541] Scoones (note 282 above) 7.
[542] Department for International Development (note 261 above).

present study, mining has a direct negative impact on natural capital. The researcher observed that "the natural resource stock (soil, water, air and genetic resources) and environmental services (hydrological cycle, pollution sinks, carbon sinks)" from which resource flows and services useful for livelihoods are depleted and degraded.[543] In the study area, access to mineral resources by the miners is open, however informal rules are used to restrict and control access to the mineral resource. The mineralized deposits in the study area, together with other natural resources such as streams and abandoned land which harbor disused mines, provide an enabling environment for ASGM. Natural pools, rainwater and tap water are the sources of water, which the miners utilize as they process their ores in as common-property resources and are mindless of polluting them.

The participants indicated that gold is found in abandoned and closed mines. The researcher noticed that the entrances to mining shafts were in informal areas and were also hidden from public view. They further mentioned that the important resource was geological knowledge. The miners said that they look for "solid rock, which has money" by conducting a test to know if a rock contains gold through chiselling the rock and panning the material to check for gold particles. By doing so, miners would be able to identify a rock rich in gold rock (that is the gold deposit) which they called a 'belt'.

In all the four sites studied, all the male miners spend 2–5 days each week in the pits. Although the land is still owned by someone else, and even though there is some policing of trespassing, and even though the miners perceive access to be difficult, access is still relatively easy, making the land, the minerals, and the water resources an open access regime.

The participants mentioned that the land is abandoned. Land is one of the critical assets that define the livelihoods of people, and mining rests on the availability and access to land and mineral deposits. For most people in ASGM communities, land is the source of financial livelihood that reinforces most of their livelihood plans. The miners lack both surface and sub-surface land rights to access gold. Complications in access to land were acknowledged in most of the sites as most participants had been arrested for trespassing. It is apparent that most participants saw access to land as challenging regardless of their employments.

[543] R Chambers, 'Sustainable livelihoods, environment and development: putting poor rural people first. Agriculture and rural problems' (Institute of Development Studies 1987) 240.

Social capital

Social resources such as social affiliations, relations, and association's demands coordinated action amongst members of a particular grouping pursuing a livelihood strategy.[544] Right to use and gain access to social assets originates from the system of support that the miners established over time. In all, four wards, the miners operate in interconnected units, with deep-rooted links of support and mutuality of services. This corroborates the fact that ASGM in the region is an undertaking that is well organized, and incriminates the other government and donor agencies, for being out of touch with the real world of ASGM in sub-Saharan Africa when they paint the sector as poorly organized.[545]

Respondents mentioned that for them to be safe in carrying out ASGM, they need to be in a particular group because turf wars are rife. They believed that being in a group afforded them some form of security from other miners underground. The researcher witnessed armed informal security guards manning the entrances to the shaft. The miners said that they pay a security fee of ZAR 50 upon entering, and when they come out also give a plate of gold-bearing ore. One participant revealed that the security guards were also responsible for accompanying them to the buyers and other sponsors to sell their gold.

In the sustainable livelihoods framework social capital bears a different characteristic as it consists of "networks together with shared norms, values and understandings that facilitate cooperation within or among groups".[546] It deals mainly with networks and links among a cluster of individuals who are connected with each other with some sort of trusted relationships, reciprocity and exchange.[547] The knowledge economies of informal mining are therefore organic and collective. ASGM therefore, relies heavily on co-operation, partnership and teamwork.

Miners highlighted that one needs to be a member of a group which enables a miner to pursue and secure a livelihood and a vast network system involving men and women. This consists of underground workers, the buyers, sponsors and surface workers. A strong collective perception

[544] Scoones (note 282 above) 9.
[545] Hilson & Banchirigah (note 205 above) 196.
[546] Organisation for Economic Co-operation and Development (OECD) 'Ageing and transport: Mobility needs and safety issues' (Organization for Economic Co-operation and Development 2001) at 41.
[547] Department for International Development (note 260 above).

held by miners that 'gold lasts forever' as an informal value chain has been witnessed. Thus, underground miners bring rock containing gold to the grinders and then the process goes to the ground sluicing, a form of gravity separation and so on. The process is repeated and brings income to many people.

The participants said that many miners are recruited through word of mouth and through observing their improved way of life. They mentioned that most people who later become permanent in ASGM are hesitant at first until they realize they can make large sums of money in mining. It is understood that most participants were undocumented migrants and lacked other labor market options. Even though the different people are from different countries they became a collective and work together and generate an income.

Financial capital

This is the capital base which includes "cash, credit/debt, savings, and other economic assets, including basic infrastructure and production and technologies) which is essential for the pursuit of any livelihood strategy".[548] The whole sector under study was characterized by lack of access to financial assets. The miners have no access to independent credit or funding. As shown on the table below, sources of funds for investment in ASGM come from personal savings, money lenders and support from friends and families.

Table 4.2: Access to credit in ASGM

Access to credit in ASGM	**Number of miners**
Informal funding	6
Personal savings	8
Family and friends	5
Financial Institutions	0

(Source: Fieldwork by author, 2018)

The effect on financial capital cannot be measured short of costs. Regardless of the increase in income, more expenses have coupled all the efforts for a sustainable livelihood. Food, accommodation, education, clothing, entertainment, fuel (wood and gas) and health make part of the household expenditure item.

[548]Chambers (note 542 above).

The participants related stories of miners who had prospered from informal mining. The researcher observed miners who had progressed up the supply chain to come to be buyers having expensive vehicles. Miners also aspire to become buyers and a desire to accumulate more money to be able to finance other miners underground. Having more money entails also that the miner would be able to trade in mercury and dynamites.

The local economy also reacts in response to ASGM activities that is the prices for basic commodities and services such as food, housing and transport are influenced by the increase in demand thereby affecting the local purchasing power. Most participants highlighted the crucial role miners played in the local economy in so far as accommodation and small businesses is concerned. They indicated that the rental for anyone suspected to be a miner was above the market price. Landlords have extended their houses and yards in anticipation of more home seekers around the Sol Platjie area. Miners were also more preferred as tenants to occupy shacks or houses because they were able and prepared to pay rentals above the market price.

The participants further indicated that taxi drivers followed the same mentality of charging miners at a premium. The miners within and around the mining shafts are easily recognized by their appearance. One participant said that competition has grown amongst the taxi drivers along the routes that lead towards mining sites to fetch miners because miners pay more for a fare. Since they look untidy resulting in complaints from other passages, miners pay more money to be accepted on a ride to and from work.

Miners mentioned that gold was mostly sold to the buyers who happened to be the suppliers of equipment and other material to the miners. It was difficult to estimate how much they were making within a month. Five out of ten of the participants estimated that a typical month's value of mining can generally bring in R 10 000 when sold to buyers, while others were not sure but gave a range which was R2000 – R 4000 per month. The researcher believes that the buyers are trading without the legal prerequisites such as a trading license and risk being arrested, robbed and killed.

Human capital

Human asset denotes "the skills, knowledge, ability to labor and good health and physical capability important for the successful pursuit of different livelihood strategies".[549] As noted above, the ages of the miners ranged from 20 to 50, with the majority under 40.

As noted above, the participants lacked the skills to obtain employment in LSM and other formal sectors. Moreover, existing literature clearly links the growth of the informal sector to downsizing of LSM resulting in rising unemployment and poverty. Structural change of economic production, and migration from rural areas and neighboring countries to urban areas are also contributors.

In the context of health care, community health officers in the studied wards identified TB, malaria, arthritis, and eye-allergy as prevailing diseases of the mining-affected patients.

Physical Capital

Most of the miners do not have their own houses. The miners stay in informal/ temporary houses in the economically deprived communities. Spending money on a permanent house is not a priority for the miners. One factor behind this is the impermanence of returns from the sector. Above and beyond housing pattern substantial variations were noticeable in the ownership of household level assets. This can be visualized from the Table 4.3 below.

Table 4.3 Possession of assets (out of 10 Samples in mining affected wards)

Assets Owned	**No. of Miners**
Cycle	2
Motor Cycle	1
Livestock	7
Pump Set	2
Generator	2
TV	4
Radio	7
Fridge	2
Mobile phones	10
Satellite Dish Antenna	4

[549] Chambers (note 542 above).

Source: Fieldwork by author, 2018

The above Table No. 4.3 indicates that the majority of the households are having livestock, TV, fridge, radio, cooler, satellite dish antenna and mobile phones. The procurement of these products has been enabled by the ability to acquire an income due to pursuing ASGM as a livelihood.

Most mining communities in Sub Saharan Africa suffer from limited access to economic assets such as roads, educational facilities, housing and general infrastructure that could improve their capabilities.[550] Access to processing equipment in the study area such as tools and machinery also limits the miners to the most basic forms of ASGM production as shown in Table 4.4.

Most of the miners said that they were using rudimentary tools such as pickaxes, hammer and chisel as indicated below in Table 4.4 below. The types of tools explain the general perception by different scholars that the sector is not mechanized and relies on hand tools

Table 4.4: Use of equipment and machinery

Equipment and tools	**Number of miners**
Rudimentary (pickaxes, spades, washing pans, wheelbarrows)	**7**
Semi mechanized (grinding machines, drillers, water pumps, sluice)	1
Rudimentary (hammer, chisel, explosives)	8

Source: Fieldwork by author, 2018

4.3 Formalization of ASGM

Formalization of ASGM has topped the agenda of the numerous institutions such as the World Bank and the International Institute for Environment and Development (IIED) as an economic activity and calling for its formalization. However, as mentioned in Chapter 2 the sector is faced with several challenges such as lack of specific policy and non-transparent systems of governance. The literature has shown that formalization can be effected through top-down, community based and small government approaches.

[550]African Mining Vision (2009).

4.3.1 Challenges of ASGM formalization

This sub-section aims to elucidate the informal rules that miners may have developed themselves to regulate access to particular assets, along with their experience of the formal rules. Miners mentioned numerous challenges linked to the lack of financial support, access to land and markets as barriers to ASGM formalization. The researcher identified that a culture of lawlessness and informality had entrenched itself in the sector. This is assumed to have been exacerbated by lack of political will, unclear roles of stakeholder involvement, lack of support programs, lack of alternative livelihoods, fragile ASM and LSM relationships, non-transparent regimes of extraction, unclear marketing structures and lack of demarcated land amenable for ASGM.

The majority of the participants (six of the ten participants) indicated that informal security guards enforce the rules as they ensure that no weapons of any kind are allowed in the shaft, or are in the possession of those around and close to the mining sites. The miners said they pay in cash to enter into a shaft and through the mined material upon exiting to these informal security mine guards. Two of the participants mentioned that the groups that these miners find themselves in are the ones that self-regulate the conduct of its members. Senior miners who have been operating within a particular site were identified as rule makers, as they were well connected to sponsors/buyers, the South African Police Services (SAPS) and the supply chain at large.

Illegality

All the participants said that their activities, which they labelled as survivalist strategy, were self-regulated as they did not have did not have permits to operate as such and were always running away from the SAPS. Eight of the ten participants were illegal immigrants, and these were conscious of their unlawful status in the Republic. Moreover, they understood they were dealing with a precious mineral without any license and often at times were arrested for trespassing on land without any permission from whosoever the owner was. Thus, ASGM in South Africa operates outside the legal framework, informally and mostly undertaken by illegal immigrants.

The sector violates several laws as indicated earlier, however, one of the transgressions include the use of mercury and other dangerous chemicals and explosives in mining and mineral processing. However, miners felt that there is little difference between being legal and illegal in South Africa as they relate how they work to produce gold through a series of coordinated events which enables them to extract, process and market the mineral.

Need for a permit

Participants indicated that they were interested to see their activities and themselves recognized by the law. They said the conditions associated with being unregistered were dire, dangerous and exploitative. The researcher observed that miners were vulnerable to arrest, corruption, injury and death due to unfavorable working conditions. They viewed themselves as identical to criminals since they are not contributing directly to the state's coffers. Lack of an effective regulatory provision for ASM has led to the illegality of ASGM and the miners are perceived in generality as criminal.

The researcher argues that the process of obtaining legal permits to mine is excessively rigid, costly and administratively difficult to get to. All participants suggest that being regularized is paramount to operate successfully, therefore formalization of ASGM is a panacea to the negative narratives that are associated with ASGM.

Prosecution

Mining operations conducted by the study participants are illegal, and they risk arrest and prosecution. During the fieldwork most of the respondents have been arrested at least twice. The participants said that they lost their equipment including gold ores and most of their personal belongings, including cash and cell phones to the police. Since the miners are easily recognizable in and around the study area, they become an easy target to stop, search, sometimes demand a bribe, confiscate property, and harass because the police are well aware that they are undocumented and therefore cannot seek for any recourse.

The miners also indicated that when they were arrested, they were charged with illegal mining, possession of precious metals, trespassing, and illegal immigration. One miner said he spent a month in jail because failed to get a bail hearing as he could not produce a proof of address. It is believed that several untold stories of police brutality have led to increased corruption. The police have gone out of their way to be in connection with the gold buyers. Some participants

recalled an instance where they were forced to give the police the contacts of a buyer so that they could demand a bribe. This has led to most miners getting tip-offs from the police if a raid is planned. This shows that the net of illegality spreads even further than the mining activity causing itself severe lawlessness. Thus, an integrated approach to formalization can assist in bringing on board all role players to contribute towards sustainable livelihoods.

Access to finance and markets

The nature and profile of the ASGM miner constrain and makes it impossible for them to access financial resources from formal financial institutions. Some of the reasons include lack of proper documentation, lack of collateral, risky business venture. The researcher observed that in times of financial problems the participants relied on the "loan shark" whose interest was high. It is believed that high interest rates charged were meant to ensure that the miners were always indebted to them.

Access to market

Lack of a formal market is another common problem the artisanal miners face. The real value of the price of gold is below the market value. Informal buyers exploit the miners because they do not have any alternative. Furthermore, the problem is exacerbated by the illegal nature of the operations which sidelines the miners from bargaining for the best deal.

Access to land

Most of the mining operations take place on abandoned mines. Nevertheless, minerals on the abandoned and privately owned piece of land remain the property of the state. Miners are denied access to these properties as they are accused of trespassing. Miners indicated that they are often charged by the police for trespassing when they are found operating within the mining sites. The miners do not hold any form of permission from whosoever is the lawful occupier of any given land but access these surface and sub-surface properties using informal rules. Access to land is regulated by informal rules enforced by unregistered private security.

4.3.2 ASGM formalization policy

Unregulated ASGM activities are prevalent in many developing countries.[551] So many debates and discussions about the sector and its associated negative impacts have been dominated within the donor and policymaking circles.[552] The artisanal gold miners (four out of ten) within the study area expressed that a specific policy will help them to carry out their work without fear. They cite that it would prevent exploitation that happens during extracting, transporting and marketing of gold security fees, protect them from sporadic raids by the police, improve the marketing price of the commodity and reduce the purchasing price of the basic commodities. They pointed out that government can effect formalization through the legalization of the sector and provide financial, material and human resources to enforce the laws. Subsequently, decentralized structures of mining administration may lead to efficiency and transparency.

Six of the ten participants said that the mining policy should monitor and control the mining operations from extraction, processing and marketing of the metal. They also indicated that having a specific policy will give them the right to mine the deposits they have encountered and have the right to mine to generate income and to sustain their families. Institutional structures that include local government or community-based organizations that support the generation of self-sustained income through ASGM were cited by (four out of ten of the participants) as the benefits of a specific policy. Such structures will facilitate an easy process to get mining permits since they would be managed locally, have support from local communities living on the direct income from ASGM and economic spin-off effects, reduce associated health risks, form associations to represent their interests and rights, and importantly pay tax and have access to credit. Thus, a policy as it seeks to be a tool to monitor ASGM activities can epitomize innovation and vitality and can provide miners with an accessible path into economic activity.

[551] Hilson & Potter (note 238 above).
[552] S M Banchirigah 'Challenges with eradicating illegal mining in Ghana: A perspective from the grassroots' (2008) 33 *Resources policy* 29-38.

4.4 Conclusion

Drawing on qualitative interviews with ten ASGM miners, this chapter has narrated the lived experiences miners endure to attain a livelihood. The following chapter examines how law mediates the different assets ASGM miners use in their livelihoods.

Chapter 5

Legal Analysis of Livelihood Assets

5.1 Introduction

This chapter extends the analysis of sustainable livelihoods by examining the legal framing of the key livelihood assets employed in ASGM. As identified in Chapter 4, these assets can be categorized as natural, physical, human, social and financial. The legal framing of these assets is determined by the relevant statutory and common laws of South Africa.

During the Apartheid era, legislative and institutional systems prohibited the majority of South Africans from productively participating in the mining sector. Since 1994, there has been a general understanding that Small-Scale Mining (SSM) could possibly be a catalyst for radical economic transformation that would promote redress and inclusion of black South Africans, improving economic activity in communities, generating jobs and growing skills.[553] SSM is time and again clustered into the broad term of "artisanal and small-scale mining" (ASM).[554] However, as detailed in Chapter 1, SSM excludes the vast majority of artisanal miners making a living in the former abandoned gold mines of South Africa. The focus of this chapter, like Chapters 2 and 4, is on artisanal mining and how the livelihood assets in this sector are moderated by several regulations. The discussion in this chapter proceeds in accordance with the particular categories of assets.

5.2 Natural Assets

ASGM operations affect natural assets that are vital determinants of livelihood. The natural livelihood assets, which the artisanal miners must use include the minerals themselves, and other natural assets such as land, water, trees and forest products, wildlife, and biodiversity. The analysis below seeks to highlight the broader understanding of illegality within the ASGM sector in regard to the direct and indirect usage of these natural assets.

[553] Artisanal Mining Report 'Legal Resource Centre' (Johannesburg 2016).
[554] A A Debra, I Watson & D P O Quansah 'Comparison between artisanal and small scale mining in Ghana and South Africa' (2014) 114 *Journal of the Southern Institute of Mining & Metallurgy* 913–21.

5.2.1 Minerals

The Constitution of the Republic of South Africa, 1996 enshrines "a right to an environment not harmful to health or well-being, and the right to have the environment protected for the benefit of present and future generations".[555] The Constitution does not expressly mention minerals. Neither does the definition of "environment"[556] in the National Environmental Management Act, 107 of 1998 (NEMA). The Mineral and Petroleum Resources Development Act, 28 of 2002 (MPRDA) defines as a mineral as "any substance, whether in solid, liquid or gaseous form, occurring naturally in or on the earth or in or under water and which was formed by or subjected to a geological process, and includes sand, stone, rock, gravel, clay, soil and any mineral occurring in residue stockpiles or in residue deposits".[557] This definition would include the gold still remaining in the shafts and on the abandoned mine dumps in the study area.

The MPRDA institutes a system of state custodianship of minerals. Section 3(1) of the MPRDA states that the mineral and petroleum resources of the country are the "common heritage of the people" under the custodianship of the state for the benefit of all South Africans.[558] This means that no-one in South Africa may own minerals before they have been separated from the land. It also means that only the State may grant permission to prospect for or remove a mineral. The state, through the Minister of Mineral Resources can, "grant, issue, refuse, control, administer and manage any reconnaissance permission, prospecting right, permission to remove, mining right, mining permit, retention permit, technical co-operation permit, reconnaissance permit, exploration right and production right".[559] Moreover, the Minister determines the fees payable for the acquisition of the given mining rights in consultation with the Minister of Finance. The state also safeguards the sustainable use and the development of all mineral and petroleum resources by developing policies, norms and standards at the same time advancing economic and social development.[560]

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[555] Section 24(1) of the Constitution of South Africa, 1996.
[556] National Environmental Management Act, 107 of 1998 (xi) "environment- means the surroundings within which humans exist and that are made up of— (i) the land. water and atmosphere of the earth: (ii) micro-organisms, plant and animal life: (iii) any part or combination of (i) and (ii) and the interrelationships among and between them: and (iv) the physical. chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being".
[557] The MPRDA became effective on 1 May 2004 and substitutes the former hybrid system of a common law system with statutory interference.
[558] Section 3(1) of the MPRDA.
[559] Section 3(2) (a) of the MPRDA.
[560] Section 3(3) of the MPRDA.

The MPRDA caters for various kinds of rights. The MPRDA prohibits any individual or persons without an applicable statutory right from extracting, removing, mining or conducting any technical co-operation activities, reconnaissance operations, to explore and produce and mineral or petroleum.[561] For SSM, the relevant right is the mining permit, outlined in section 27 of the MPRDA. It is worth noting that one could run a SSM operation that is a Small-Medium Enterprise (SME level) under the mining right category of license or right granted in terms of s 23. The Act does not prevent that. The mining permit is nevertheless best suited for SSM operations because it grants the "holders the exclusive right to extract for designated minerals over a designated area of land not exceeding five hectares for a set period of time not exceeding two years".[562] However, as noted in Chapter 1, the mining permit does not cater for artisanal-scale mining.

Section 5A of the MPRDA states that, "no one may prospect for, remove or mine any mineral, or commence any work incidental thereto on any area, unless he or she holds an environmental authorization; a prospecting right, mining right or mining permit (amongst others); and has given the landowner or lawful occupier of the land at least 21 days written notice".[563] The requirements to obtain a prospecting right, mining right or mining permit are onerous.

For example, an applicant for a mining right is required to conduct an environmental impact assessment (EIA) and submit reports to obtain an environmental authorization, must submit a mining works program and social and labor plan (SLP), and provide the DMR with a financial assurance in respect of the aspirant's rehabilitation commitments. For the smaller-scale right – the mining permit – an applicant must submit an environmental authorization application, an environmental management plan[564] and a rehabilitation guarantee.

The environmental authorization mandatory in terms of the NEMA for a mining permit includes the basic assessment report, environmental management program, closure plan, specialist report and the environmental audit report. Upon issuing an environmental authorization, personal details including name, address, and contact details together with the

[561] Section 5A of the MPRDA 49 of 2008.
[562] Section 27 of the MPRDA.
[563] Section 5A of the MPRDA.
[564] Section 27(6)(b) of the MPRDA.

description of the activity and its location must be specified.[565]Regulation 26 (h) of the EIA Regulations requires that an environmental authorization be granted only when the requirements are met. These include, environmental plans, an independent assessment of financial provisions for rehabilitation and environmental liability, closure plans, audit reports and all compliance monitoring report.[566]

As concluded from the literature review in Chapter Two,[567] small-scale miners prefer mining permits over mining rights because there are challenges in obtaining a mining right. However, even a mining permit demands a substantial outlay capital to address environmental-related issues during the initial application stage. In addition, the limited time and the aerial extent of the mining area are seeming flaws linked with mining permits in contrast to mining rights as it is not commensurate with the financial requirements which are not easy and affordable for the majority and thereby limit sustainable growth.

Under Regulation 19 of the EIA, it is required that a basic assessment report be submitted to the competent authority. The report should include specialist reports from Environmental Management Programme (EMP), closure plans and public participation processes. A basic assessment report should be submitted within 140 days of the receipt of the application.[568]

The assessment report must deal with issues relating to the financial provisions for rehabilitation, closure and post closure of prospecting, mining or general production operations where the application for an environmental authorization is directly concerned.[569]

Regulation 20 of the EIA then entitles that within 107 days of the receipt of the report, the competent authority or Minister responsible for Mineral Resources, where relevant grant or refuse environmental authorization based on complying with the financial provisions for rehabilitation, closure and ongoing post decommissioning management of negative environmental impacts.[570] Every holder of an environmental authorization is mandated to annually assess his or her environmental liability and submit an audit report to the Minister responsible on the adequacy of financial provisions. Thereafter, an independent assessor is or

[565] Regulation 26 of the Environmental Impact Assessment Regulations, 2014.
[566] Regulation 26(h) of the Environmental Impact Assessment Regulations, 2014.
[567] See Section 2.3.2 of Chapter Two of this thesis.
[568] Regulation 19 of the Environmental Impact Assessment Regulations, 2014.
[569] Ibid.
[570] Regulation 20 of the Environmental Impact Assessment Regulations.

will be appointed if the Minister is not satisfied with the assessment and the financial provisions and the holder in question must bear the cost. Given the lived conditions and the general nature of the miners and the requirements of the assessment report, it is impossible for the miners to fulfil the requirements and be granted an environmental authorization.

According to Appendix 1 of the EIA Regulations, the EIA process must be conducted within the approved plan. The process seeks to determine the degree of impacts, policy and legislative context and outline the need of the activity. Therefore, the EIA should encompass the details of the EAP report, location of the activity, description of the scope as well as the full description of the process of the EIA together with an outline of significant impact, risks and measures to respond to the impacts. These clear guidelines amongst the miners under study were not followed prior to undertaking the mining activity.

In addition to these upfront requirements, the MPRDA and the NEMA establish ongoing monitoring and reporting requirements for the holders of mining permits. For example, s 28 of the MPRDA provides that, the holder of a mining permit should keep all records of mining activities together with the appropriate and correct financial records depicting the transactions in connection with the mining activities. It is also incumbent upon the mining permit holder or anyone in charge of any processing plant independently operating from a mine to submit accurate and correct monthly returns together with the audited annual financial reports.[571]
Auditing requirements attached to mining permit seek to report the extent of compliance with regards to the environmental authorization, environmental management plan and the closure plan. They also seek to highlight the extent of mitigation and management measures as provided for by the environmental management plan. It is required that audit reports identify and evaluate impacts and risks, effectiveness, and shortcomings of the environmental plan. Again, the audit report must indicate the details of the person who prepared the report, declaration of the independent auditor, scope, methodology, description of the findings regarding the gaps as well as an account of the consultation process.[572]

[571] Section 28 of the MPRDA.
[572] Appendix 7(3) of the Environmental Impact Assessment Regulations, 2014.

Financial provisions for rehabilitation are also important requirements for a mining permit to be granted as stipulated in the MPRDA and the NEMA. The MPRDA defines "financial provision" as:

> "The insurance, bank guarantee, trust fund or cash that applicants for or holders of a right or permit must provide in terms of sections 41 and 89 guaranteeing the availability of sufficient funds to undertake the agreed work programs and to rehabilitate the prospecting, mining, reconnaissance, exploration or production areas".[573]

This definition highlights that mining activity cannot commence before acceptable financial provisions that are meant to rehabilitate the environment are provided. Section 24N(7)(e) of the NEMA requires that the holder or any person issued with an environmental authorization must, "as far as is reasonably practicable, rehabilitate the environment affected by the prospecting or mining operations to its natural or predetermined state or to a land use which conforms to the generally accepted principle of sustainable development".[574] The responsibility to remedy environmental damage must conform to the approved environmental management program or plan. The applicant for a mining permit is required to determine the financial provisions to manage the environmental impacts of the mining operation before the Minister of Mineral Resources accepts the environmental plan. These provisions can be used if the holder of a permits fails to manage the negative environmental impacts. The holder is also expected to retain the financial provision until a certificate is granted and to annually evaluate the environmental liabilities to the satisfaction of the Minister. These financial provisions may be used to rehabilitate the environment during the mining period and after mine closure.

Section 89 states that no mining activity may begin unless the holder of a mining permit has financially guaranteed the availability of adequate funds to rehabilitate the environment during exploration, production and mine closure.[575] Section 28 also states that, "holder of a mining right or mining permit must, at the registered office or place of business of such holder, keep proper records of mining activities and proper financial records in connection with the mining activities".[576]

Section 24P of NEMA also elaborates on the financial provision for remediation of environmental impacts. It states that an applicant for an environmental authorization

[573] MPRDA 28 of 2002.
[574] Section 24N(7)(e) of the NEMA.
[575] Section 89 of the MPRDA.
[576] Section 28 of the MPRDA.

concerning any mining related activities must make the recommended financial provision before the Minister responsible for mineral resources to make a determination.[577] Based on the findings, the miners lack the legal and financial capacity to adhere to the requirements of the environmental authorization.

Failure to act in accordance with the provisions of section 28 of the MPRDA is an offence carrying a potential fine of 100,000.00 or a jail term not exceeding two years, or both a fine and imprisonment.[578] In the case of an offense referred to in section 49A(c) of the NEMA, regarding failure to obtain an environmental authorization, any person convicted is liable to a penalty fee not above R10 000 000.00 or to a jail term for a period not more than 10 years or to both such fine and such jail terms.[579]

Given all these legislative requirements, none of the miners in the study area had a mining permit. The miners could not meet the above-mentioned legal requirements to acquire an environmental authorization. During the fieldwork process, the researcher observed that the miners were evasive and unmindful of the requirements of the environmental law.

The MPRDA is not the only statute governing minerals in South Africa. The mining and processing of gold is also governed by the Precious Metals Act 37 of 2005. Precious metal is well-defined in this Act as "the metal gold, any metal of the platinum group and the ores of such metals; and any other metal that the Minister has declared by notice in the Gazette to be a precious metal for the purposes of this Act, and the ores of any such metal".[580] Section 4 of the Precious Metals Act sets out a number of prohibitions relating to the acquisition, possession or disposal of unwrought[581] precious metal. It states that "no person may acquire, possess, or dispose of any unwrought precious metal unless he or she holds a refining license, is an

[577] Section 24P of the NEMA
[578] Section 99(a) of the MPRDA.
[579] Section 49B of the NEMA.
[580] Precious Metals Act 37 of 2005.
[581] Precious Metal Act 37 of 2005 defines unwrought as;

> "precious metal that- (i) is unrefined (including concentrate and matte), or has been refined to a purity less than 99,9% and has not undergone any manufacturing process other than being refined or formed into a bar (but not a minted bar), an ingot, a button, plate, sponge, powder, granules, (excluding granules made from precious metal that has been refined to or beyond 99,9% purity, and carat gold alloys), solution; or is prescribed as any substance, material or product of similar form to any such substance, material or product listed in paragraph (a)(i); or (b) any article or substance containing or consisting of precious metal contemplated in paragraph (a), but does not include any article that is of archaeological interest or that has been processed or manufactured for one or more specific industrial, professional or artistic uses".

authorized dealer; is a producer who has won or recovered such unwrought precious metal; has obtained a certificate authorizing him or her to acquire or to dispose such metals; or is the holder of a precious metal beneficiation license".[582] The researcher interacted with miners in possession of gold ready to be sold to unknown buyers. Some had dust particles of gold and others were in the process of crushing and making use of mercury to extract gold from the waste particles. According to the Precious Metals Act, activities by miners and their colleagues would be unlawful.[583] Section 20 of the Precious Metal Act states that any person acquiring, possessing, or disposing unwrought precious metal should be an authorized dealer. Thus, any unauthorized dealer trading in unwrought precious metal is potentially liable to a fine not exceeding one million rands or a jail term of not more than 20 years.[584]

There are several other provisions of the Precious Metals Act that regulate gold as a livelihood asset for artisanal miners. There are special regulatory provisions relating to the possession, processing and additional beneficiation of mined minerals. Section 14(1) of the Act states that authorized dealers are entitled to purchase precious metal from an authorized person in any form. This means that the buyer and the seller ought to show proof of certification that authorizes them to acquire and dispose of such precious metal. When the transaction takes place, the holder of a certificate who is authorized to procure or dispose the precious metal must give the authorized dealer the certificate for a period that may be endorsed.[585] As explicitly put across by the Precious Metals Act, one should be authorized to deal in precious metals. There was no evidence to suggest this regulation was being observed in the study area, since most miners professed ignorance when asked and told of the illegality of being in possession of precious metal.

The Precious Metals Act also prohibits the transportation of precious metals. Several miners at all sites indicated that they used private and even public transport to carry their "soil" to a crushing site. However, section 13 of the Precious Metals Act states that "a person may not transport or in any manner convey any semi-fabricated or unwrought precious metal outside the boundaries of any mine, works or other property or place where such metal is mined, refined

[582] Ibid.
[583] Precious Metals Act 37 of 2005.
[584] Section 20 of the Precious Metals Act.
[585] Section 14(1) of the Precious Metals Act.

or worked with, unless he or she is in possession of the prescribed documentation".[586] The consequence for contravening this provision results in the termination of the license [587]

The evidence gathered from the research suggests that the upper level of the gold chain is international buyers.[588] The gold that the miners produce finds itself exported outside the country.[589] In addition to restrictions on possession, the Precious Metals Act stipulates that a permit is required to export precious metals, and export levies are imposed. Furthermore, the MPRDA provides that "no person other than a producer that has offered local beneficiaries the prescribed percentage of its production of minerals may export designated minerals or mineral products without the Minister's prior written approval".[590] This rule impacts on the exporters, other than the miners themselves. The sale of gold to buyers and international syndicates' highlights how the whole chain is illegal, and this goes on to indicate that miners do not attach any meaning of the law to how they operate. Likewise, lack of access to local and national markets and the availability of open foreign markets have facilitated artisanal gold miners' illegal operations.

In terms of section 16 (1) of the Precious Metal Act, the police are empowered to inspect, search, and seize precious metals found to be in possession of individuals illegally.[591] Conversely, the responses that the researcher, acquired when a question concerning arrests, raids and seizure of their "soil" or gold was asked, the miners revealed that police accept bribes to release them without trial and seize their gold. One is easily persuaded those levels of criminality in the sector are rampant, even amongst the law enforcers. Miners also boasted that

[586] Section 13 of the Precious Metals Act 37 of 2005.
[587] Section 20(3) of the Precious Metals Act 37 of 2005.
[588] Chamber of Mines, 2017.
[589] Ibid.
[590] Section 26 of the MPRDA.
[591] Precious Metal Act 37 of 2005 S 16(1) S16(1) of the Precious Meal Act[591],

> "a member of the South African Police Service may at any reasonable time, without prior notice and on the authority of a warrant issued in terms of subsection (5) and subject to section 17, enter and search any premises that have a bearing on an investigation and are specified in the warrant, including a private dwelling, and may- *(a)* seal, mark or otherwise secure any package or container found in or on such premises; (b) take an account of all precious metal found in or on such premises and, if necessary, take such precious metal into custody;
> (c) search any person on those premises if there are reasonable grounds for believing that the person has an article, a document or a record in his or her possession that has a bearing on the investigation;
> (d) take extracts from, or make copies of any book, document or record on the premises and that has a bearing on the investigation."

(e) "demand the production of and inspect any licence, permit, certificate or document that is relevant to the inspection; and take samples of any substance that is relevant to the inspection."

they had contacts and their "bosses" were well connected and had contacts in the criminal justice system. The controlled and organized nature of the sector also means that detained miners speedily get substituted because the principals are roaming free. Unfortunately, this ends up in the fruitless and futile execution of the law.

5.2.2 Other natural assets

In addition to minerals themselves, ASGM miners use other natural resources in carrying out their livelihoods, including land, water and biodiversity. As noted above, section 24 of the Constitution enshrines the right of everyone to an environment that is not unsafe to his or her health or well-being. Such an environment can be realized by legislative and institutional measures to protect, conserve the present and future resources from degradation while at the same time ecologically, socially and economically sustaining development.[592]

The protection of the environment is taken further by the NEMA. The NEMA is the principal environmental statute of South Africa. Its main purpose is to "provide for co-operative environmental governance by establishing principles for decision-making on all matters affecting the environment".[593] NEMA defines environment as, the "surroundings within which humans exist; and these include water, land, organisms, plant and animal life together with their combinations and interrelationships between them".[594] Pollution is also defined as any change in the environment caused by the introduction or presence of pollutant substances into the natural environment. These contaminants may take form in "substances, radioactive or other waves or noise, odours, dust or heat emitted from any activity with adverse effect on human health".[595]

The researcher witnessed changes in the environment due to ASGM activities. Water bodies were polluted by mercury, the atmosphere within the area was contaminated by dust emitted from crushing gold ores and burning mercury. ASGM activities in the study areas have become a theatre of environmental offenses because enforcement of environmental regulations is difficult. Essential to note, is that there are adverse effects on health that would be realized not so long in the future on the miners and the community at large. At the moment, the need for

[592] Section 24 of the Constitution of the Republic of South Africa, 1996.
[593] Environmental Management Act, No. 107 of 1998.
[594] Ibid.
[595] Ibid.

immediate gains with no regard to environmental management is tantamount to negative impacts on the surroundings.

NEMA further provides for a set of environmental management principles which "guide its interpretation, administration and implementation, as well as all other laws concerned with the protection or management of the environment in South Africa".[596] These principles function as a structure whereby the management of all environmental affairs must take place.

Section 37 of the MPRDA states that any mining activity should be undertaken in agreement with the environmental management principles.[597] There are two principles of environmental management of note that are set out in chapter 1 of NEMA. The first is articulated in section 2(2) and it states that, "environmental management must place people and their needs at the forefront of its concern, and serve their physical psychological, developmental, cultural and social interests equitably".[598] Section 2(3), on the other hand, states that "development must be socially, environmentally and economically sustainable".[599] These principles are meant to apply to all activities conducted by an individual or the state that have the propensity to affect the environment. They serve as a framework and guideline for the formulation of statutory provisions, other laws and environmental plans and their implementation.

The two principles are relevant to the study because people's needs are important amidst any development initiative. Within the study area, the researcher noticed that economic and social interests were prioritized at the expense of socioeconomic and environmental sustainability. This principle highlights a fundamental aspect of integration and sustainability. However, it was observed that the second principle was contravened as pollution and environmental degradation were uncontrollable, environmental rights were infringed and the disturbance of the ecosystem and landscapes abound in the pursuit for the attainment of developmental, socioeconomic and physical needs.

The second principle also considers the following factors as important pillars of sustainable development. These include environmental justice, responsibility and accountability to

[596] Artisanal Mining Report, Legal Resource Centre (2016).
[597] Section 37 of the MPRDA.
[598] Section 2(2) of the NEMA.
[599] Section 2(3) of the NEMA.

environmental health and safety, equitable access to environmental resources, participation of all interested parties including women, community well-being and empowerment in environmental issues.[600] These factors, however, have been disregarded by the miners because of the nature of mining that is exploiting what seemed to be a "common resource". The researcher understands that sustainable development was difficult to achieve because several disabling factors such laws and regulations on livelihood assets were preventing from being fully empowered on environmental issues and thereby leading them to the unavoidable unsustainable means detrimental to the environment.

As stated in the above discussion, an environmental authorisation issued in terms of NEMA is mandatory to conduct mining operations, even for the SSM activities associated with a mining permit. The following are the activities listed in the Notice issued by the Minister under section 24(2) and 24(5) of NEMA 107 of 1998 that would require environmental authorization as a prerequisite to commence any activity.[601] There are more than 60 activities outlined in the Notice. However, the researcher will mention major activities that need environmental authorization.

Environmental authorizations are also requisite for other operations related to mining, such as major development and vegetation clearance such as mining, road construction and expansion and development of facilities for the generation of electricity from renewable and non-renewable resources.

On mining, any undertaking which requires a prospecting right (Section 16) or mining permit (Section 27) of the MPRDA, includes related structures and infrastructure, requires an environmental authorization granted based on submission of a basic assessment report. Environmental authorization is also required on the decommissioning of any mining activity, together with the closure certificate.[602] The application must address issues relating to "financial provision for the rehabilitation, closure and post closure of prospecting, mining or production operations".[603]

[600] Section 2(4) of the NEMA
[601] Environmental Impact Assessment Listing Notice 1 of 2014.
[602] Section 43 of the MPRDA.
[603] Ibid.

The EIA regulations also advance those major activities, such as undertaking several interrelated activities in different locations require submission of a single application for environmental authorization.[604] As reasoned above,[605] it is a criminal offense to begin with such undertakings before acquiring an environmental authorization.

Section 28 of the NEMA, deals with the statutory duty of care to prevent pollution. It outlines that the duty for preventative measures for any significant environmental pollution or degradation is upon any individual who might cause and has caused environmental damage.[606] The duty to take practical and rational actions for any activity or process that can cause pollution and degradation of the environment is paramount. Section 28(9), stipulates that should an individual fail to take reasonable measures, the Director General of the Environmental Management together with the Director General of Mineral Resources may take measures to enforce compliance or remedy the situation by recovering the costs incurred respectively for failing to inhibit pollution or degradation of the environment.[607]

In recent years, the South African environmental sector has undergone a period of rigorous environmental law reform to integrate and harmonize legislation on natural resources management.[608] In addition to the NEMA, natural resources are governed by a set of Specific Environmental Management Acts or SEMAs. The SEMAs relevant for this study include the National Water Act, 36 of 1998; the National Environmental Management Air Quality Act, 39 of 2004, which deals with issues of air quality; and the National Environmental Management Waste Act, 59 of 2008, which demands waste producers to acquire a license for waste management. Additional regulatory frameworks apply to biodiversity, noise, protected areas, protected trees and heritage. Observations of the miners included in the study indicated they were committing several environmental offenses related to water and air pollution.

Water

The National Water Act (NWA) recognizes that the government has primary responsibility for water resources management, including its beneficial use, equitable allocation, redistribution,

[604] Regulation 11(4) of Environmental Impact Assessment Regulations Listing Notice 1 of 2014.
[605] See Section 5.2.1 of Chapter Five of this thesis.
[606] Section 28 of NEMA.
[607] Section 28(9) of NEMA.
[608] Department of Mineral Resources, 2017.

protection and conservation.[609] The Act establishes a system of custodianship over water resources. NWA defines water resources 'including a watercourse[610] surface water, estuary[611] and aquifer[612]'. This definition would include any collection of water available and being used in the study area.

The MPRDA states that, subject to the National Water Act, 1996, the holder of a mining permit "may use water from any natural spring, lake, river or stream situated on, or flowing through, such land or from any excavation previously made and used for prospecting or mining purposes, as the case may be, or sink a well or borehole required for use relating to prospecting or mining, as the case may be, on such land".[613] However, the artisanal miners do not have mining permits, so this concession to use water would not apply to them. However, minimum water use under the general authorizations is permitted. Even so, it is accepted that most mining activities would necessitate the acquisition of a water use right and water use covered by the general authorizations.

According to Section 21 of the (NWA) water use[614] entails taking water from either the water course, estuary, aquifer or surface water and storing it.[615] Water use includes blocking the flow or redirecting the water to a within a watercourse as well as changing the banks, bed and the general course of the river. Some of the uses include recreation, discharging water from any water resource for the safety of people. The Act further stipulates that, water comprising or holding waste which harmfully impact on a water resource can be discharged and be disposed through any apparatus and conduits such as pipes. Under Schedule 1 of the National Water Act, minimum uses of water are specified to include taking water for domestic use, store and

[609] National Water Act, No. 36 of 1998.
[610] "Watercourse" means-
> "(a) a river or spring: (b) a natural channel in which water flows regularly or intermittently: (c) a wetland. lake or dam into which, or from which, water flows: und (d) any collection of water which the Minister may, by notice in the Gazette, declare (o be a watercourse, and a reference to a watercourse includes, where relevant, its bed and banks:"

[611] "estuary" "means
"a partially or fully enclosed body of water— (a) which is open to the sea permanently or periodically; and (b) within which the sea water can be diluted, to an extent that is measurable, with fresh water drained from land;
[612] "aquifer" means a geological formation which has structures or textures that hold water or permit appreciable water movement through them;"
[613] Section 7(b) of the National Water Act 36 of 1998.
[614] "Water use is defined broadly, and includes taking and storing water, activities which reduce stream flow, waste discharges and disposals, controlled (activities), activities which impact detrimentally on a water resource), altering a watercourse, removing water found underground for certain purposes, and recreation."
[615] Section 21 of the National Water Act.

use run-off water, discharging run-off water and disposing water containing waste.[616] The use of water by the miners under study is illegal because they have no water license and their activities cannot fit under the General Authorization where a person is permitted to use water domestically.

One type of water use to be considered is the general authorization. Section 21 laydown different water uses which have been subjected to so many changes over time under the general authorizations as listed in table 5.1 below. For example, General Authorization Regulations for water uses in terms of section 21(a) (taking water from a water resource) and (b) (storing water) and (g) disposing of waste in a manner which may detrimentally impact on a water resource.

In terms of the Regulations no water that is taken in terms of this authorization may be taken within a 500-metre radius from the boundary (delineated edge) of a wetland, pan or estuary. Furthermore, no groundwater that is taken in terms of this authorisation may be taken within a 500 metre radius from the boundary of a wetland or estuary, within a 100 metre radius from the delineated riparian edge of a water course or a state dam, within a 500 metre radius of a state dam wall or within 500 metres from the high -water mark of the ocean.[617] If water is taken within these restrictions, a water use licence must be acquired.

The taking or storing of water in terms of this authorisation that must be registered may only be exercised if the water use has been registered. Therefore registrations requirements are applicable to a person who has lawful access to property to: takes a maximum volume of 2000 cubic metres per year on a property or piece of land in terms of this authorisation must register the water use with the responsible authority.[618] A person who takes no more than 40 000 cubic metres of water from a groundwater resource per year on a property or piece of land in terms of this authorisation must register the water use with the responsible authority.[619] Given the requirements for taking and storing water, the use of surface water by miners is unlawful because they do not own or lawfully occupy the land.

[616] Schedule 1 of the National Water Act.
[617] Section 2.3(2) of the Revision of General Authorisation for the taking and storing of water, Government Gazette Notice: GN 538 in GG 40243 of 2 September 2016.
[618] Section 3 of the GN 538.
[619] Section 4.1(1) of the GN 538.

According to the disposing of waste in a manner which may detrimentally impact on a water resource section 21(g), general authorisation does not apply to a person who is not the lawful occupier of the land or who does not have lawful access to the land on which the disposal takes place.[620] This authorisation is applicable throughout the Republic of South Africa, except for those subterranean government water control areas .This authorization will be applicable for five years from the date of publication of this notice, unless it is amended by the responsible authority at any review period; or the period is extended by a notice in the Gazette; it is replaced with a general authorization in relation to a specific water resource or within a specific area. [621]

Section 3(10) deals with the disposal of mine waste or residue. It states that a person may dispose of mine residue into mine residue deposits provided that the mine residue is not from a Category mine; that is any gold or coal or any mine with extractive metallurgical processes.[622]

It is an offence to use water other than as permitted under the National Water Act.[623] A person who contravenes any provision of this general authorization is guilty of an offence and is subject to the penalty set out in section 151(2) of the National Water Act. Any person who contravenes any provision of fail to comply with any condition attached to a permitted water use under this Act is guilty of an offence and liable, on the first conviction, to a fine or imprisonment for a period not exceeding five years, or to both a fine and such imprisonment and, in the case of a second or subsequent conviction, to a fine or imprisonment for a period not exceeding ten years or to both a fine and such imprisonment.[624]

The purpose of a general authorization is to regulate the procedure and criteria of application of water use to avoid or minimize negative impacts on the water resources. The general authorizations seek to enable a responsible authority, after public comments to permit the use of water. The responsible authority publishes the general authorization in the Government Gazette. The general authorization replaces the need for a water user to apply for a license in

[620] Section 3 of the Revision of General Authorisations in terms of Section 39 of the National Water Act, 1998 (Act No. 36 of 1998) (The Act) Published under Government Notice 665 in Government Gazette 36820, dated 6 September 2013.
[621] Section 3.9(c)(1) GN 665.
[622] Section 3(10) of the GN 665.
[623] Section 151(1)(a) of the National Water Act.
[624] Section 151(2) National Water Act.

terms of the National Water Act. The authorizations of water use "may be limited to a particular water resource, particular category of persons, a defined geographical area or period of time and requires conformity with other relevant laws".[625]

Since 2004, a number of General Authorizations have been published. As shown in the table below, these authorizations were intended to apply for specific periods, and have been revised or have been continued over time. Application of these general authorizations depend on several factors, such as the nature, category of person, particular water use and geographical area of water use undertaken at a period of time within the restrictions laid down in each general authorization. A re-assessment on the lawfulness of General Authorizations need to be carried out if, the water use may have been issued and authorized before, have been amended or revised over time. Several changes to the General Authorizations in respect of different water uses listed in section 21 of the National Water Act are presented in the table format below. This gives a good sense of the byzantine complexity of the regulatory framework industrial facilities must work in.

Table 5.1 *(by Melissa Strydom; PhD fellow*)**:** Illustrates the changes to the published General Authorisations for specific water uses.

[625] Section 38 of the National Water Act.

Section 21 Water Use	1999	2004	2009	2010	2012/13	2016
(a) taking water from a water resource and (b) storing water.	GN1191 valid for 5 years	GN399 valid for 5 years	GN313[626]	GN837[627]	GN970[628]	GN538[629] effective 20 years
(e) engaging in a controlled activity identified as such in section 37 (1) or declared under section 38 (1)	GN1191[630]	GN399 valid for 5 years	GN313	GN864[631]	GN94[632] replaced by GN665[633]	GN383[634]
(f) discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit.	GN1191 valid for 5 years	GN399 valid for 5 years	GN313	GN864	GN94 replaced by GN665	GN383
(c) impeding or diverting the flow of water in a watercourse. (i) altering the bed, banks, course, or characteristics of a watercourse.	-	GN398 valid for 5 year	GN314[635] replaced by GN1198[636] and 1199	-	GN94	GN509[637] effective 20 years
(g) disposing of waste in a manner which may detrimentally impact on a water resource.	GN1191 valid for 5 years	GN399 valid for 5 years	GN313	GN864	GN94 replaced by GN665	GN383
(h) disposing in any manner of water which contains waste from, or which has been heated in, any industrial or power generation process.	GN1191 valid for 5 years	GN399 valid for 5 years	GN313	GN864	GN94 replaced by GN665	GN383
(j) removing, discharging, or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people.	-	GN398[638]	-	-	Replaced by GN665	GN383

In addition to the table, it is important to discuss in short, changes in these General Authorizations over time. Thus, one looks at the section that deals with disposing of waste in a manner which may detrimentally impact on a water resource[639] to identify if there are more

[626] Dated 20 March 2009 extending its application to 1 Oct 2010.
[627] Dated 23 Sept 2010 extending its application to 30 June 2012.
[628] Dated 30 Nov 2012 extended its application.
[629] Dated 2 Sept 2016 replaced GN 399 and GN970.
[630] Extended in GN1288 to 7 Feb 2003; GN1163 to 8 Feb 2004; GN123 to 27 Feb 2004; GN256 to 26 March 2004.
[631] Dated 29 Sept 2010 extending its application to 1 April 2011.
[632] Dated 11 Feb 2013 extending its application to 3 Sept 2013.
[633] Dated 6 Sept 2013.
[634] Dated 12 July 2019 extending its application until a new GN is published.
[635] Dated 20 March 2009 extending its application to 31 December 2009.
[636] Dated 18 December 2009. General Authorisation in terms of section 39 of the National Water Act, section 21(c) and (i) for the purpose of rehabilitating a wetland for conservation purposes.
[637] Dated 26 Aug 2016 replaced GN1199
[638] Dated 26 March 2004.
[639] Section 21(g) of the National Water Act.

substantial or cosmetic changes over the years. So, the researcher focuses on GN 399 of 2004; GN 665 of 2013 and 383 of 2016 as revised and amended.

Section 3(13)(3) of GN 665 states that location of wastewater storage dams and wastewater disposal sites must be located at least outside a 500-metre radius from a boundary of a wetland.[640] And 500 metre radius from a borehole that is utilized for drinking water or stock watering.[641] The amendment gives specific radius that should exist between a disposal site and a water resource. This is a substantial change compared to the preceding GN 399 of 2004, which does not stipulate the distance that should exist. Therefore, with such a position, enforcement of regulations becomes effective.

Section 3(13)(15) of the GN 365 of 2013 stipulates methods for sampling and analysis. It identifies South African National Standards (SANS) as an applicable accreditation board.[642] Therefore, laboratories accredited in accordance with the SANS to conduct analysis and measure specific substances in any waste or wastewater. Preceding GN of 2004 does not lay down methods to determine the levels and parameters of waste in water resources. Therefore, sampling and analysis gives a clear indication to the offense because levels of waste are measure and their impact to human and aquatic life is determined.

On section 3(18) of the GN 365, incidence reporting is introduced. It states that "any information on the occurrence of any incident that has or is likely to have a detrimental impact on the water resource quality must be reported to the responsible authority within 24 hours".[643] The changes that have been presented can be perceived as substantial because they seek to redress gaps that exist in the earlier published general authorizations. Therefore, dealing with irresponsible waste disposal within 24 hours can be regarded as a prompt response to mitigate against an impending detrimental impact.

Last, the current GN 383 of 2016 is a continued application of the General Authorization for related activities gazetted under GN 665 of 2013. Given the section that looks at the disposal of waste, it is evident that the revisions of the General Authorizations seek to give detail on a

[640] Section 3(13)(3) Revision of General Authorisations in terms of Section 39 of the National Water Act, 1998 (Act No. 36 of 1998) (The Act) Published under Government Notice 665 in Government Gazette 36820, dated 6 September 2013.
[641] Section 3(13)(6) of the GN 665
[642] Section 3(13)(15) of the GN 665.
[643] Section 3(18) of the GN 665.

matter so that the implementation and enforcement is completed with efficacy given the negative impacts that emanate from waste disposal.

Miners in the study area were using water to process their gold ores. In one area, the water was taken from a small natural stream and in other areas, water was accessed from Johannesburg City by illegally connecting water bypassing the meter system. Artisanal gold miners upon not holding a mining permit, do not possess a water license. Natural streams as well as tap water are primary sources of water. Miners use this water unsustainably and reduces the quality thereof as water in the streams is polluted by mercury and piped water is not paid for but stolen.[644]

The administrative requirements for obtaining a water use license are outlined in section 22 of the National Water Act. The Act prohibits any person without a license to use, store, discharge and dispose waste. Section 22 outlines important requirements for water license application by the responsible authority that include a specification of the property and area, details of the person to whom it is issued, the license period, review period and the conditions subject to which the license is granted. It is essential to note that the miners have no capacity to apply for such a license as they do not own the land or have access to any area of land, as well as lacking identification. The researcher observed miners taking, storing, and discharging waste contaminated with mercury into a natural stream which the above section prohibits.

ASGM operators do not have pollution prevention measures in place for their impact on water resources. Section 19 of the National Water Act indicates that an individual who owns, controls, occupies or uses the land in question is liable for ensuring that appropriate measures to prevent pollution of water resources. The measures may include the need to:

> Cease, modify or control any action or process causing the pollution, comply with any prescribed waste standard or management practice, contain or prevent the movement of pollutants, eliminate any source of the pollution, remedy the effects of the pollution and remedy the effects of any disturbance to the bed and banks of a watercourse.[645]

[644] National Water Act.
[645] Ibid.

However, most of the sites which miners operate are ownerless and abandoned. Miners cannot take the measures meant to be executed by the catchment management agency concerned to prevent the pollution because their activities are illegal and nomadic.

Air Quality

The National Air Quality Act seeks to change and transform the regulations that govern air quality to safeguard the environment from pollution and degradation. The Act seeks to achieve ecologically sustainable development by providing measures that enable and promote specific air quality standards by all spheres of the government.[646] Therefore the Act oversees the formulation, implementation, monitoring and control of all measures that seek to promote the prevention of air pollution while promoting social and economic development.

Section 36 of this Act indicates that mining is one of the listed activities that must be licensed by municipal authorities. It states that "metropolitan and district municipalities are charged with implementing the atmospheric emission licensing system referred to in section 22 and must for this purpose perform the functions of licensing authority".[647] In addition to a water use license, artisanal miners therefore require an atmospheric emissions license.

Section 37 of the Air Quality Act outlines the obligatory requirements to obtain an atmospheric emission license. These requirements demand that the applicant specify the emission volume rate, normal working conditions, emission measurements, pollution prevention plans, the reporting system as well as the application processing fee. [648] The researcher finds the miners in no position near to satisfy the requirements necessary to acquire a license. The miners do not have an appropriate enterprise information, physical address of their operations, the capacity to detail the emission and production rate. Thus, ASGM activities violate the Act because they operates without any atmospheric emission license and are therefore, liable for a fine or a jail term of a period not more than ten years.[649]

Waste Management

[646] National Environmental Management: Air Quality Act 39 of 2004.
[647] Ibid.
[648] Section 43 of the Air Quality Act 39 of 2004.
[649] Section 52 of the Waste Act 59 of 2008.

The Waste Act 59 of 2008 seeks to govern matters relating to waste management in order to safeguard health and the environment. This is done by ensuring and providing sustainable measures such as standards, institutional arrangements, licensing and control, compliance and enforcement to prevent degradation and pollution of the environment.[650] The Act defines waste as a substance or product "that is a surplus, unwanted, rejected, discarded, abandoned or disposed".[651] Waste under the current study entails substances such as tailings slag discarded around the crushing and gold processing sites.

In addition to the atmospheric emission license, artisanal miners therefore require a waste management license. Section 43 of the Waste Act stipulates that the Minister of Mineral Resources is the licensing authority.[652] The requirements to obtain a waste management licence include personal details, an application fee and proper and detailed documentation. However, the artisanal miners operate without the prescribed license, while their activities continue to release surplus and unwanted substances to the environment. The activity shows that all the requirements concerning the prevention, control and mitigation of degradation and pollution are not observed. The researcher submits that this is due to the nature of work in ASGM and the institutional barriers against enforcing responsibility and accountability.

Land

In addition to the ability to use water, the atmosphere, and the capacity to generate waste, the ability to access land is also a resource needed to carry out ASGM as a livelihood. The Trespass Act 6 of 1959 is relevant to the issue of accessing land. The main purpose of the Act is to forbid the access or presence upon the land, and the entrance of or presence in buildings, of any person without permission from the lawful occupier.[653] ASGM miners transgress the law as they find themselves on land without permission. At the Langlaate site, which is now a Provincial Heritage site the researcher found several ASGM miners preparing to enter a mine shaft without the permission, thereby contravening the abovementioned Act.

The miners have little or no regard, for their illegal occupation of land. They regard themselves as self-regulated. For example, the sector is highly securitised. Before entering a shaft, miners

[650] Waste Act 59 of 2008.
[651] Waste Act.
[652] Section 43 of the Waste Act.
[653] Trespass Act 6 of 1959.

observe informal rules imposed on them by those who assume custodianship of the mining site. Informal rules include payment of a certain fee before entering and upon exit another payment is made to the informal security, but this time in kind, that is a plate of gold ore.

Transfer and Encumbrance

Under the provisions for a "mining permit", the MPRDA S 27(8) stipulates that,

> "a mining permit (a) is valid for the period specified in the permit, which may not exceed a period of two years, and may be renewed for three periods each of which may not exceed one year; (b) may not be transferred, ceded, let, sublet, alienated or disposed of, in any way whatsoever, but may be encumbered or mortgaged only for the purpose of funding or financing of the mining project in question with the Minister's consent".[654]

There are limitations on the transfer of rights to conduct reconnaissance, exploration and mining. The MPRDA section 27 covers limitations on the capacity to "transfer reconnaissance rights, prospecting rights, mining rights, exploration rights and production rights". Any agreement for a transfer should be granted upon written consent of the Minister of Mineral Resources. Therefore, the Minister is mandated to award such approval if the transfer fulfils the conditions for the awarding of a right in the first place. Disposals give effect to by the nullification of rights which are capable of being formally registered in the Mining Titles Office. Self-regulation in ASGM has enabled transfer and leasing of mining to take place, something that is not permissible by the law.

5.3 Human Assets

ASGM operations affect human assets that are vital determinants of livelihood. The human livelihood assets, which the artisanal miners have include the household members' active labor and the ability to work, education, good health, knowledge and skills. The analysis below seeks to elaborate the broader understanding of illegality within the ASGM sector in regard to the direct and indirect usage of these human assets.

5.3.1 Immigration

[654] Section 27(8) of the MPRDA.

The Immigration Act makes provision of the regulations regarding admissions, residence and departure of people in South Africa. Most of the artisanal miners are illegally residing and working in the country. The law requires that for anyone working in South Africa, one should be in possession of a valid work permit. In addition, work permits, are subject to scarce skills requirements which I assume would be difficult for these artisanal miners to qualify for. Some of the relevant requirements needed to acquire a work permit include a medical certificate, criminal record clearance certificate from home country and copies of personal identification.

The Department of Mineral Resources maintains that 70 percent of artisanal miners are illegal immigrants.[655]On one side, gaining access to the reserves of gold, miners enter the mines to work using their abled bodies together with the skills and knowledge to attain their livelihood objectives. Doing so is a form of human capital mediated by the provisions of the Immigration Act and the Mine Health and Safety Act. However, illegal foreigners[656] under the Immigration Act are subject to expatriation.[657] The Act further states that:

> An immigration Officer may, without the need for a warrant, arrest an illegal foreigner or cause him or her to be arrested, and shall, irrespective of whether such foreigner is arrested, deport him or her or cause him or her to be deported and may, pending his or her deportation, detain him or her or cause him or her to be detained in a manner and at a place determined by the Director-General.

Eight of the ten study participants were foreign undocumented immigrants. Even though the sample was small, these findings resonate with what the (DMR) mentioned on the composition of miners involved in ASGM. The law does not provide any avenue for these miners to become legal immigrants. However, the law requires them to go back to their home countries and apply for the work permit.

5.3.2 Children's Act 38 of 2005

The Act intends to "give effect to certain rights" as enshrined in the Constitution of the Republic.[658] It seeks to outline guidelines and provisions regarding care and protection,

[655] Department of Mineral Resources, 2017.
[656]"Illegal foreigner "is defined by the Immigration Act "as a foreigner who is in the Republic in contravention of this Act."
[657] "Deport or deportation" is defined by the Immigration Act "means the action or procedure aimed at causing an illegal foreigner to leave the Republic in terms of this Act."
[658] Children's Act 38 of 2005.

adoption of children, parental duties, children's courts and to give effect to The Hague Convention on International Child Abduction.[659] The ILO Convention says that "mining is one of the worst forms of child labor."[660] Child labor is defined as work by a child in places unsuitable for a person of that age, causing serious and life threatening harm to the child's health, wellbeing, education and development.[661] The definition speaks to the work within the ASGM sector where children were seen partaking in some activities which the adults were involved, even though the children's participation was marginal.

Section 28 of the Constitution of the Republic likewise prohibits child labor and protects children's rights against inappropriate and exploitative work practices.[662] Moreover, section 141 of the Children's Act prohibits any person to, "use, procure, offer or employ a child for labor".[663] Therefore, in the case of the miners under study, the social worker working in that community, whenever he or she becomes aware, is obliged to report to the police any conduct regarding children contravening the provisions of the Constitution, Children's Act, and in general the Basic Conditions of Employment Act of 1997.

Section 10 of the Children's Act highlights that "every child that is of such an age, maturity and stage of development as to be able to participate in any matter concerning that child has the right to participate in an appropriate way and views expressed by the child must be given due consideration."[664] Furthermore, according section 17 specifies that, "a child, whether male or female, becomes a major upon reaching the age of 18 years".[665] The researcher observed several minors involved in peripheral tasks such as fetching water to wash the gold ore. These marginal tasks are done due to the nature and location which they find themselves in. The law on matters regarding prohibition of child labor are clearly pronounced.

5.3.3 Mine Health and Safety Act 29 of 1996 (MHSA)

The Mine Health and Safety Act 29 of 1996 (MHSA) mostly regulates occupational health and safety matters in the republic. The MHSA seeks to safeguard the health and safety of mine

[659] Ibid.
[660] https://www.ilo.org/wcmsp5/groups/public/---asia/---ro-bangkok/---ilo-manila/documents/publication/wcms_720743.pdf last accessed on 28 May 2020.
[661] Chapter 1 of the Children's Act.
[662] Section 28 of the Constitution of the Republic of South Africa, 1996.
[663] Section 141(1) (e) of the Children's Act.
[664] Children's Act.
[665] Section 28(3) of the Constitution of the Republic of South Africa, 1996.

workers and other persons affected by mining operations.[666] The MHSA was created for all interested persons, communities and stakeholders to acknowledge the possible risk faced by workers and persons involved or affected by mining activities. Employers are urged to take applicable and appropriate action in dealing with and controlling the risks to which employees may be exposed while working in a mine. Thus, execution and enforcement of the MHSA falls within the realm of the Department of Mineral Resources (DMR). Under the direction of the Chief Inspector of Mines, the DMR has created numerous regional mine health and safety inspectorates, each under the guidance of a regional Principal Inspector of Mines.[667]

To determine statutory legal responsibility for health and safety duties at mines one must differentiate between three categories of mines; a mine that is legitimately "being worked; a mine that is not being worked, but in respect of which no closure certificate has been issued; and a mine that is not being worked and in respect of which a closure certificate has been issued and a mine placed under liquidation."[668] In the case of a mine that is being operated, section 2 of the MHSA states that the rights holder must, as far as is judiciously possible, ensure that the mine is designed, fashioned and equipped to provide conditions for safe operation.[669] These same duties apply to the employer of a mine which is not being worked and in respect of which a closure certificate has not been issued under the MPRDA, that is the employer must take practical measures to frequently prevent accidents, injuries, ill-health, and loss of life or harm of any kind from happening at or because of the mine.[670]

The holder of a mining right must apply for a closure certificate upon, amongst others, the lapsing, winding up or termination of the right.[671] A closure certificate is only dispensed once the holder's responsibilities in relation to environmental, health and safety legal responsibility have been met.[672] Obtaining a closure certificate is a burdensome process and is not easily issued by the DMR.[673] Part of the problem is that the continued illegal ASM activity may make

[666] Artisanal Mining Report, note 2 above.
[667] Mine Health and Safety Act 29 of 1996.
[668] Aggregate and Sand Producers Association of Southern Africa (ASPASA 2016).
[669] Section 2 of the Mine Health and Safety Act.
[670] Section 2 of the MHSA.
[671] Section 43 of the MPRDA.
[672] Section 43 of the MPRDA.
[673] South African Human Right Commission 'Issues and Challenges in relation to Unregulated Artisanal Underground and Surface Mining Activities in South Africa' (Report of the SAHHRC Investigative Hearing 2014) on at 24.

it difficult for the licensed operator to achieve the required level of closure obligations and obtain a closure certificate.

The abandoned mines could fall into one of two categories, which are "those in respect of which closure certificates have been issued and those in respect of which closure certificates have not been issued". Theoretically, in the case of the latter, the mineral right holder remains accountable under Section 2 of the MHSA "to take reasonable steps to continuously prevent injuries, ill-health, and loss of life or damage of any kind from occurring at or because of the mine".[674] Conversely, in practice this obligation is largely upon the state as the holder cannot be found, nor has insufficient funds to perform its obligations. Additionally, the obligation is only "to take reasonable steps", which are often inadequate to prevent illegal miners, as they will use all accessible means such as the use of explosives, bribery, and violence and so forth to gain access to minerals. In relation to the MHSA, "no person may cause or permit an employee under the age of 18 to work underground in a mine."[675] No children were seen working underground in the abandoned mined shaft in the fieldwork. However, children in the custody of these miners indirectly work as auxiliary laborers.

Furthermore, the Act notes in section 22 that it is mandatory that an employee take reasonable care to protect themselves and others by ensuring that they abide by all measures put in place to promote health and safety.[676] There is a huge gap that exists between the expectations of the law and the inadequate measures that the miners take to protect themselves. Miners enter the shaft without reasonable care, in so far as protective clothing is concerned. Casual protective gear worn by miners includes helmet, hand gloves, kneecaps, and head lamps. Miners are exposed to rock falls, mine collapse, toxic gases, flooding and fire. The degree of reluctance towards health and safety is alarming as they are susceptible to a range of risks and hazards. However, the status of these miners is illegal, and they cannot be classified as an employee as they are not part of a registered company, moreover, they are liable to be prosecuted for contravening the MHSA.

5.3.4 Occupational Diseases in Mine and Works Act 78 of 1973 (ODIMWA)

The Occupational Diseases in Mine and Works Act (ODIMWA) seeks to accomplish and realize the formulation and implementation of the regulations concerning the payment of

[674] Section 2 of the MHSA.
[675] Section 85(1)(2) of the Mine, Health and Safety Act.
[676] Section 22(a)(b) of the Mine, Health and Safety Act.

compensation associated with "diseases contracted by people employed in mines and works".[677] A certificate of fitness is defined by the Act as a 'certificate given to a person after a medical examination'.[678] This means that a medical certificate is a prerequisite to employment. Controlled mine and works, according to section 9 and 10 of the ODIMWA are mine and works that were controlled under the repealed Pneumoconiosis Compensation Act 64 of 1962.[679] Therefore, the Minister of Health and Welfare is obligated to make a declaration of what constitutes "risk work". Under the previous Act, risk work constituted any work that "exposes workers to dust or gases, vapors or chemical substances that are harmful or potentially harmful."[680] The miners in the study are undertaking risk work that is dangerous and has a potential to cause harm to their lives.

Section 44 of the ODIMWA classifies gradations of compensable diseases and requires that the certification committee must award compensation. The ASGM sector cannot be certified due to the incapacity to meet all required criteria for certification of compensable diseases. For example, section 43 (2) states that:

> The Minister responsible for National Health and Welfare, upon determining such standards shall consider representations made by owners of controlled mines or controlled works, or by any organization acting on behalf of such owners or on behalf of persons who perform risk work at controlled mines or controlled works. Operators become guilty of an offense and liable on conviction of fraud, false misrepresentation and knowingly making a false statement or misrepresentation or concealing any fact of material importance with intent to obtain a certificate of fitness.

The researcher gathered that several artisanal gold miners have gotten ill or injured. Some have lost their lives due to accidents or inhaling toxic gases within the shafts. Some fail to get medical assistance as they fail to produce police reports and other supporting documents indicating the cause and nature of injuries. Regardless of contracting various compensable diseases ASGM activities circumvent the law by operating without a certificate of fitness as upheld by the ODIMWA.

[677] Occupational Diseases in Mine and Works Act 78 of 1973.
[678] Ibid.
[679] Section 9 & 10 of the Occupational Diseases in Mine and Works Act.
[680] Pneumoconiosis Compensation Act 64 of 1962.

5.4 Physical Assets

Physical assets represent the basic infrastructure such as transport, shelter, water, energy and communications and the requisite operating equipment and means that permit people to undertake livelihood occupations. This subsection discusses the legal framing of these assets. The research mainly focuses on the tools and equipment for production and the laws that ring-fence these assets. These laws include, the Explosives Act 15 of 2003, the Hazardous Substances Act 15 of 1973, the National Heritage Resources Act 25 1999 and the Firearms Control Act 60 of 2000 to understand the illegality of the sector in so far as the use of physical assets to a livelihood is concerned.

5.4.1 Explosives Act 15 of 2003

The Act seeks to provide for the control of the use of explosive to prevent the endangering of life and property. The miners use blasting powders and dynamite to crack the rocks underground. These forms or kinds of substances are smuggled into the country and some of them are supplied by buyers and criminal syndicates. Explosives are defined as:

> A substance or a mixture of substances in a solid or liquid state, which is capable of producing an explosion; a pyrotechnic substance in a solid or liquid state, or a mixture of substances designed to produce an effect by heat, light, sound, gas, or smoke or a combination of these, as the result of non-denotative self-sustaining exothermic chemical reaction, including pyrotechnic substances which do not evolve.[681]

According to the given definition, the substance that the miners were using are explosives. According to section 13 of the Explosives Act one who sells or deal with explosives is required to be in possession of a license.

The Act stipulates that unauthorized person are prohibited to sell or deal with explosives without a license to deal with explosives. These requirements include that an applicant submit

[681] Explosives Act 15 of 2003.

an example of the explosive material to the Chief Inspector of Explosives under the Ministry of Safety and Security[682] and submits a specimen of such explosives to the Forensic Science Laboratory of the South African Police Services (SAPS) in Pretoria.[683]

With respect to the above-mentioned requirements relating to the manufacturing, transportation and use of explosives, artisanal miners do not have the capacity to obtain an explosives license since they are undocumented in the first place. The miners also lack the financial and legal means to submit the required specimen to the authorities because the criminal syndicates control the supply of the specimen.

5.4.2 Hazardous Substances Act 15 of 1973

The Act is the important piece of legislation regulating chemical substances and seeks to provide guidelines for "the control of substances which may cause injury or ill-health to or death of human beings by reason of their toxic, corrosive, irritant, strongly sensitizing or flammable nature or the generation of pressure thereby..."[684] It further provides for the regulations that prevent and control the manufacturing, trade, importation, use, and discharge of hazardous substances.

A hazardous substance is defined as:

> Any substance or mixture of substances which, during customary or reasonable handling or use, including ingestion, might, by reason of its toxic, corrosive, irritant, strongly sensitizing or flammable nature or because it generates pressure through decomposition, heat or other means, cause injury, ill-health or death to human beings.[685]

There are four categories of hazardous substances, namely, the group I which comprise of industrial chemicals and pesticides (mercury and cyanide are classified under group 1); group 2 emphasizes nine classes of wastes (excluding explosives and radioactive substances); then

[682] Section 18 of the Explosives Act 15 of 2003.
[683] Section 20 of the Explosives Act 15 of 2003.
[684] Hazardous and Substance Act 15 of 1973.
[685] Section 2 Hazardous Substance Act 15 of 1973.

group 3, include, electronic products and group 4 entails radioactive substances.[686] Mercury is a physical asset and a toxic substance which the miners use to amalgamate gold particles.

One of the objectives driving the formalization of ASGM is the need to reduce mercury emissions and releases from ASGM activities. In fact, there is a GEF (Global Environmental Facility) program under implementation (PLANETGOLD)[687] and another one being developed (GOLD+).[688]

South Africa is a signatory of the Minamata Convention on Mercury Pollution of 2013 which seeks to safeguard human health from the anthropogenic harmful impacts of mercury. This global convention was ratified in South Africa in April 2019.[689] The Department of Health is the authority behind the Hazardous and Substance Act 15 of 1973 and responsible for controlling and regulating the production, use, and trade of hazardous substances. The development of appropriate policy and regulatory and institutional frameworks (in National

[686] Hazardous and Substance Act 15 of 1973.

[687] https://www.planetgold.org/

> "The planetGOLD programme works in partnership with governments, the private sector, and ASGM communities in nine countries to significantly improve the production practices and work environment of artisanal and small-scale miners. By working to close the financing gap, supporting formalization, raising awareness, and connecting mining communities with mercury-free technology and formal markets, the programme aims to demonstrate a pathway to cleaner and more efficient small-scale gold mining practices that benefit everyone, from mine to market. Supporting countries' commitments under the Minamata Convention on Mercury, the planetGOLD programme is working to eliminate mercury from the supply chain of gold produced by artisanal and small-scale miners by: supporting efforts to integrate the ASGM sector into the formal economy, society, and regulatory system; facilitating miners' access to formal gold supply chains, in partnership with gold buyers and industrial users; piloting a range of models for access to investment and finance for small-scale miners and their communities; introducing and facilitating access to mercury-free technologies and best practices in ASGM."

[688] https://gefportal2.worldbank.org/

> "GOLD+, aims to deepen mercury reduction in ASGM through a holistic multisectoral integrated formalization innovations. This takes into account all facets of gold production and supply chain and consideration of all sectors that enable an optimally functioning ASGM sector with capacity to reduce mercury use and support sustainability. The program responds to the GEF 7 Chemicals and Waste Focal Area Strategy priorities, which require high level of innovation and integration, and interventions developed to be sustainable beyond the life of the GEF project. It responds to GEF 7 program principles of building on or using existing networks, regional, national and sub-national institutions. The program aims to achieve the long-term goal "to prevent the exposure of humans and the environment to harmful chemicals and waste of global importance." As designed, the program is consistent with the GEF-7 Chemicals and Waste element CW-1-1: Strengthen the sound management of industrial chemicals and their waste through better control, and reduction and/or elimination. Various multilateral environmental agreements and global processes including the Minamata Convention on Mercury also inform the design of the program."

[689] http://www.mercuryconvention.org/Countries/Parties/tabid/3428/language/en-US/Default.aspx

Action Plans) by countries is one of the requirements for parties to the Convention like South Africa.

Section 4(a) of the Hazardous Substances Act states that the Director-General of Health may issue a license to any natural person who intends to supply, sell or distribute group 1 hazardous substances, such as, mercury, explosives and radio-active materials.[690] The Act requires that an applicant make a payment of a prescribed fee and subject himself of herself to set conditions set by the Director-General. Mercury trade is also covered by the Minamata Convention. It was found that mercury was a substance that was supplied to miners illegally, thereby contravening the provisions that require anyone carrying on a business to supply mercury to be in possession on a license.

The Act prohibits the dumping and disposal of hazardous substances on land, any waterbody, and any facility unless the disposal is sanctioned by law.[691] The miners under study have committed serious offenses in so far as the sale, use and disposal of hazardous substances are concerned. Miners are largely exposed to the use of mercury rather than other safer processes of extracting gold. The disposal of the hazardous substances thereof is not authorized by law, therefore causing pollution of the environment and harm to health.

5.4.3 National Heritage Resources Act 25 of 1999

The National Heritage Resources Act introduces a unified and co-operative system for the management of national heritage[692] resources and empowers civil society to develop, nurture and conserve their heritage resources so that they may be conferred onto the generations to come.[693] This Act champions and promotes the conservation, good management of the legacy and national estate so that it may be bestowed to future generations. Langlaagte Deep Mining Village, Langlaagte, Johannesburg – where illegal mining takes place - is also a Provincial Heritage Site.

In terms of section 27 of the National Heritage Resources Act:

[690] Section 4(a) of the Hazardous Substance Act 15 of 1973.
[691] Section 26 of the Hazardous Substance Act.
[692] ‘‘heritage site’’ means a place declared to be a national heritage site by SAHRA or a place declared to be a provincial heritage site by a provincial heritage resources authority.
[693] National Heritage Resources Act 25 of 1999.

> The responsible heritage resources authority may make regulations pertaining to heritage sites under its control, or to any other heritage site with the consent of the owner of that site, *(a)* safeguarding heritage sites from destruction, damage, disfigurement, excavation or alteration; *(b)* regulating the conditions of use of any heritage site or the conditions for any development thereof; *(c)* regulating the admission of members of the public to a heritage site, and the fees payable for such admission.[694]

As mentioned in this Chapter,[695] legal findings indicate that the heritage resource authority has failed to safeguard the heritage site in question and has led to the vandalism and destruction of the site due to artisanal mining. Miners were seen trespassing at Langlaate, a Provincial Heritage Site as they were accessing and entering premises to mine without permission.

The Act prohibits anyone without a permit to damage, disfigure, alter, subdivide or in any other way develop any part of a protected area unless, at least 60 days prior to the initiation of such changes consult with the heritage resources authority on the designated or protected areas.[696] The Act further prohibits the demolition of any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority.[697]

Based on the fieldwork, the capacity of miners to comply with the heritage resources was non-existent because miners were ignorant of the prohibitions under the Heritage Resources Act and the illegal nature of their work compelled them to circumvent the law. Findings showed that archaeological sites and meteorite were defaced and removed[698] without permit issued by the South African Heritage Resources Authority (SAHRA).

Item 1 of the Schedule regarding penalties for National Heritage Act states that a fine or imprisonment for a period not exceeding five years or to both such fine and imprisonment in relation to offences under section 28, 34 and 35 of the Act in question.

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[694] Ibid.
[695] See Section 5.2.2 of Chapter Five of this thesis.
[696] Section 28(3) of the National Heritage Resources Act.
[697] Section 34(1) of the National Heritage Resources Act.
[698] Section 35(4) "No person may, without a permit issued by the responsible heritage resources authority— (a) destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite; (b) destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite; (c) trade in, sell for private gain, export or attempt to export from the Republic any category of archaeological or palaeontological material or object, or any meteorite."

5.4.4 Firearms Control Act 60 of 2000

The Act seeks to develop an effective system to control the use of firearms. There have been numerous bloody turf wars among illegal miners in the study area. The informal security guards around the studied mine shaft were in possession of firearms. Community members around the area mentioned that they were used to hearing gun shots almost every night and people running and screaming. They indicated that they kill each other over disputes for better territories.

The Act prohibits any person from being in possession of a firearm without a license. Section 11 of the Firearms Control Act, specifies that the National Commissioner of the Police is the Registrar of Firearms and responsible for issuing firearms licenses.[699] Section 2 of the Act in question stipulates that "an applicant requiring accreditation for a purpose contemplated in the Act, must apply to the Registrar for such accreditation together with any required supporting documents, to the relevant Designated Firearms Officer".[700]

To obtain a firearm license, the requirements amongst many includes that an applicant is a South African citizen or a holder of a permanent residence permit, competency certificate, proof of residence, proof of safe use and lawful purpose of the firearm for self defense.[701] The miners do not qualify to be in possession of a firearm license because their activities are illegal and most of the artisanal miners are not South African citizens and holders of permanent residence status.

It is difficult to assert that the firearms used or in possession of those in this sector are licensed as the activities and the operations are illegal and contravene a myriad of regulations. The researcher submits that the activities are elusive, lawless and dangerous and require an integrated approach to control and uplift to support livelihoods.

5.5 Social Assets

ASGM operations are affected by social assets that are vital determinants of livelihood. The social livelihood assets are resources that the artisanal miners draw on to make a living, and

[699] Section 11 of the Firearms Control Act 60 of 2000.
[700] Section 2 of the Firearms Control Act.
[701] Section 13 of the Firearms Control Act.

they include good relationships with the powerful and those like themselves. The analysis below seeks to highlight the broader understanding of illegality within the ASGM sector in regard to the direct and indirect usage of these social assets as these are not only a means but an end to themselves as they contain an intrinsic value like the human assets. The researcher identified ability to work, access to security and health care service as vital social assets to achieve livelihood outcomes.

5.5.1 The Labor Relations Act 66 of 1995

The Labour Relations Act (LRA) regulates collective labour rights in South Africa. As such, it deals with employee participation, collective bargaining, and the organizational rights of trade unions.[702] Labor relations are both a human and social asset because they relate to the ability of one to work in good health and promote employee associations and participation.

The ASGM sector also falls beyond the ambit of labor legislation. The Labor Relations Act 66 of 1995 fails to acknowledge ASM, as they are illegal and informal workers. ASGM miners cannot advance their interests through the processes of collective bargaining recognized in the Act. Some of the reasons why these miners cannot participate is because they are illegal immigrants, and their activities are illegal as well.

While it is accepted that miners, whether locally sourced, internal migrants or workers recruited from neighboring countries are not there to be 'discarded' once the operation does not fetch the commodity price that makes it profitable, the Department of Labor cannot apply the relevant labor legislation as a way of addressing unregulated artisanal mining issues because technically, no employer-employee relationship exists. Instead, as a form of self-employment and because it concerns mining, the regulation of this sector should fall within the ambit of the DMR.

5.5.2 Basic Conditions of Employment Act 75 of 1997

The Basic Conditions of Employment Act gives effect to the right of fair labour as referred by the Constitution of the Republic of South Africa[703] and complying with the obligation of the

[702] Labour Relations Act 66 of 1995.
[703] Section 23(1) of the Constitution of South Africa.

International Labour Organization (ILO).[704] Fair labour practices according to the Act regards to, the provision of contacts of employment, working time, leave, prohibition of employment of children[705] and forced labor, particulars of employment and remuneration.[706]

Most ASGM participants were illegal immigrants with no work permit and subject to deportation. Moreover, it is difficult for the Department of Labour to regulate and determine fair labor practices on the sector because miners are not registered under any company as employees[707] and their operations are often associated with criminality.

Section 93 of the Act lay down penalties that would be levelled against convicted offenders. The penalty could be a fine or imprisonment of a period not less than 1 year and a maximum of 3 years.[708]

5.5.3 Private Security Industry Regulation Act 56 of 2001

The Private Security Industry Regulation Act provides for the regulation of the services of the private security industry. It defines security services as activities to protect people and property, giving advice on safety and security, conducting functions of a private investigator and providing services to safeguard individuals or property.[709] Further provisions deal with the requirements for security service provider registration. Section 23 of the Act states that any fit and proper person can register as a security provider on condition that one is a citizen of the Republic or has a permanent residence status and has relevant security training.[710] However, during the fieldwork process, the researcher was told by the miners that mine shafts were manned by unregistered private security. This indicates that the activities of ASGM are also in contravention of the provision stipulated in the Act in question.

5.5.4 National Health Act 61 of 2003

[704] Basic Conditions of Employment Act 75 of 1997.
[705] Section 43 & 44 of the Basic Conditions of Employment Act.
[706] Basic Conditions of Employment Act.
[707] "employees" means –
(a) "any person, excluding an independent contractor, who works for another person or for the state and who receives, or is entitled to receive, any remuneration; and
(b) any other person who in any manner assists in carrying on or conducting the business of an employer.
[708] Section 93 of the Basic Conditions of Employment Act".
[709] Private Security Industry Regulation Act 56 of 2001.
[710] Section 23 of the Private Security Industry Regulation Act.

The National Health Act "gives effect to the right the right of everyone to have access to health care services".[711] This right is also guaranteed by section 27 of the Constitution of the Republic of South Africa, 1996 and obligates the state to provide everyone access to free primary health care services.[712] The miners narrated that they were often discriminated against and sometimes denied access to public hospitals and clinics, as they were perceived to be illegal immigrants, thus, ignorant that the law requires that provision of health care to everyone should be ensured. However, miners often got health care services from private clinics and hospitals if the situation is dire and sometimes from the local traditional healers, spiritualists and from mobile community health officers.

5.6 Financial Assets

The ASGM activities affect financial assets that are pivotal contributing factors of livelihood. The financial livelihood assets, which the artisanal miners must use include access to financial services, access to markets, consistent inflow of income and savings. The analysis below seeks to highlight the broader understanding of illegality within the ASGM sector with respect to the direct and indirect access, usage and control of these financial assets.

5.6.1 Mineral and Petroleum Resources Royalty Act 28 of 2008

In terms of the Mineral and Petroleum Resources Royalty Act, there are royalties to be paid to the State based on earnings before the payment of ordinary taxes. In terms of section 2 of the Act, "a person that wins or recovers a mineral resource from within the Republic must pay a royalty for the benefit of the National Revenue Fund in respect of the transfer of that mineral resource".[713] The miner's nature of work is evasive and difficult to enforce the payment of royalties. None of the miners that were interviewed paid royalties.

5.6.2 Income Tax Act 58 of 1962

The Income Tax Acts provides for taxation of personal incomes and donations. It makes provision for employees to meet their fax liabilities.[714]Artisanal miners do not submit tax returns as mandated by the Act. The DMR stated that the state loses R7 billion a year from tax

[711] National Health Act 61 of 2003.
[712] Section 27 of the Constitution of the Republic of South Africa.
[713] Mineral and Petroleum Resources Royalty Act 28 of 2008.
[714] Income Tax Act 58 of 1962.

evasion due to illegal mining. This is simply because the operations are illegal as the transactions are conducted outside the law as well.

The absence of suitable financial, technical, marketing support and other related institutions affects the development and sustainability of ASGM. The lack thereof, supports the assertion that the law impedes the sector from growing and enabling it to contribute to the fiscus through direct tax contributions.

5.6.3 National Small Business Act 102 of 1996

In South Africa, a small business is defined as an activity "employing less than 50 people and has an annual turnover of less than R7 million with fixed and moveable assets of less than R4, 5 million".[715] This official characterization is from the National Small Business Act, which is a statutory framework legislated to encourage Small, Medium and Micro Enterprises (SMMEs) establishment and growth in the country. The ASGM observed in the study should be considered as a category of a small business. The Act in fact places ASM undertakings on a proportional level with other small businesses in other economic sectors such as manufacturing, agriculture, retail and construction, commercial and associated sectors. However, the position does not fit the current profile of ASGM in South Africa as miners lack several prerequisite items such as a home address, bank account, identity documents and capital.

The understanding of small business needs to be broadened to fit the characteristics of ASGM in South Africa. A broader definition of ASGM needs to include mining activities which are currently unregulated. The range of operations conducted by persons or groups, most operations are poverty-driven, predominantly unauthorized and undercapitalized, oftentimes permanent or seasonal in nature, technologically backwards with little mechanization, and the sector is informal and carried out illegally, and it is well known for the low standards of safety, health and environment.[716]

5.6.4 The Banks Act 94 of 1990

Miners join ASGM because it is a source of income. Amongst other sources of livelihood, they depend on assistance from families and friends through borrowing. However, the income they

[715] National Small Business Act 102 of 1996.
[716] Minerals and Mining Policy of South Africa, 1998.

receive from ASGM is not sustainable as it is not brought within the banking system and can therefore not be re-allocated to grow the economy. Because the earnings from ASGM are not bankable, they are also vulnerable to theft. Miners have no financial security and risk of loss of life through mine collapse and without any form of savings or social security through a pension. The miners cannot afford to borrow money from the bank because they do not have bank accounts. The financial viability of the miners is also heavily affected by the lack of collateral.

In terms of The Banks Act 94 of 1990 the business of the bank[717] is to accept deposits, utilizing the money, granting money to a lender and investing money from the depositor.[718] The functions of the bank cannot be utilized by miners in question since the bank upon receiving, utilizing and granting money is mandated to prepare all relevant documentation which the miners do not possess. Their nature of work first and foremost disqualifies them from opening an account because it is a criminal activity. Therefore, miners continue to operate without using the banks either to receive, borrow or pay money.

5.6.5 Local Government: Municipal Systems Act 32 of 2000

The local municipality is mandated through the tariff policy[719] to provide delivery of services, service provision arrangements and civic service districts; make available for credit control and

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[717] "the business of a bank" means -
(a) "the acceptance of deposits from the general public (including persons in the employ of the person so accepting deposits) as a regular feature of the business in question;
(c) the utilization of money, or of the interest or other income earned on money, accepted by way of deposit as contemplated in paragraph (a) -
(i) for the granting by any person, acting as lender in such person's own name or through the medium of a trust or a nominee, of loans to other persons;
(ii) for investment by any person, acting as investor in such person's own name or through the medium of a trust or a nominee; or
(iii) for the financing, wholly or to any material extent, by any person of any other business activity conducted by such person in his or her own name or through the medium of a trust or a nominee;
(d) the obtaining, as a regular feature of the business in question of money through the sale of an asset, to any person other than a bank, subject to an agreement in terms of which the seller undertakes to purchase from the buyer at a future date the asset so sold or any other asset."

[718] The Banks Act 94 of 1990.

[719] "(2) A tariff policy must reflect at least the following principles, namely that-
(a) users of municipal services should be treated equitably in the application of tariffs
(b) the amount individual users pay for services should generally be in proportion to their use of that service;
(c) poor households must have access to at least basic services through-
(i) tariffs that cover only operating and maintenance costs,

provides for policies and measures for debt collection.[720] However, miners mentioned that they do not pay for the electricity and water they use. Therefore, in terms of housing, the miners do pay rent to the landlords for their accommodation. Failure to pay for these services emanates from the shared culture by the residents in general, who indicated that the 'government in 1994 promised free houses, water and electricity'. There is a total disregard to pay for the services rendered by the local authority.

5.7 Conclusion

In short, having discussed the legal implications on the access and use of assets, it is worthwhile to note that there is a web of illegality that spreads out from the illegal activity. A livelihood strategy fails to achieve sustainable outcomes because the miners are subjected to short term and unviable illegal means. Hence, the law acts as an impediment towards the realization of positive livelihood outcomes. Bringing the practice and rendering the benefits of mining to the grassroots of the people and mainly the poor are what can be a transformative and possibly decolonial political development in South Africa and other postcolonial economies and polities of the Global South. The next chapter analyses the study findings with reference to the literature review and research questions.

(ii) special tariffs or life line tariffs for low levels of use or consumption of services or for basic levels of service; or
(iii) any other direct or indirect method of subsidisation of tariffs for poor households;
(d) tariffs must reflect the costs reasonably associated with rendering the service, including capital, operating, maintenance, administration and replacement costs, and interest charges;
(e) tariffs must be set at levels that facilitate the financial sustainability of the service, taking into account subsidisation from sources other than the service concerned;"

[720] Local Government: Municipal Systems Act 32 of 2000.

Chapter 6

Reforming Artisanal and Small-scale Gold Mining

This chapter seeks to critically analyze the empirical results derived from the fieldwork and legal analysis in order to answer the main research question on how the law could be reformed to facilitate ASGM as a livelihood strategy. The main claims made in the literature, which broadly centers on ASGM as a livelihood strategy and how it can be formalized, are central in unpacking the dynamics that exist in the sector. This chapter also seeks to respond to the four sub-questions of this thesis, namely the appropriate conceptual framework for understanding ASGM and livelihoods; the contribution of the sector to livelihoods; how the law impedes ASGM as a livelihood strategy; and how the sector can be better regulated.

6.1 Conceptual framework for understanding ASGM and livelihoods

As Chapter Two of this study showed, there are a variety of scholarly and legal definitions of ASGM. These definitions conceptualize ASGM as labor intensive, subsistence-driven, and characterized by poverty. Legal definitions add to the common characterization of the sector in terms of the mining method, duration, aerial size and transferability. Chapter Four described how miners included in the study used primitive and traditional methods to extract and process gold. Their undertaking resonates with most definitions regarding the mining method, which entails the use of manual tools. However, other common features such as duration and the aerial size are difficult to be observed by miners as expected and stipulated by the law because the nature of their work is illegal. This finding confirms the claim that the miners' operations are unregulated and carried out informally and illegally.[721]

The limited fieldwork confirmed Dreschler's observations of the sector, namely of a livelihood activity with low levels of mechanization, labor intensive, illegal and informal,[722] although the size of the sample is too small to be generalizable to ASGM more broadly. The research participants indicated that it was their sole income generating activity, despite the use of rudimentary tools. This finding resonates with what Sinding highlighted regarding the sector's use of basic equipment to cope, adapt and remain resilient amidst vulnerabilities.[723] The level

[721] Ledwaba & Nhlengetwa (note 17 above) 28.
[722] Dreschler (note 148 above) 123.
[723] Sinding (note 217 above).

of mechanization and the method of mining in this sector distinguish this sector from other forms of mining, as it indicates that it is the lowest, micro-artisanal form.

In South Africa, all unlicensed artisanal mining is illegal, but the fieldwork supported Hentschel, *et al*'s observation of governments in many countries that the sector is often illegal in a broader sense.[724] Almost all of the participants were illegal immigrants, and their operations contravened several other regulations.

According to the different types of ASGM outlined by Weber-Far et al, the study found that the miners were both permanent and shock-push artisanal miners. Most participants had settled and worked around the mines for a long period. Even though ASGM is not only informal, but illegal, the sector seems to have endured for long due to political and socioeconomic imperatives driving the activity as well as the lack of and indeed collusion of enforcement authorities. Due to loss of employment and economic collapse miners find themselves under the shock-push category. This observation resonates with Hinton, that ASGM is poverty-driven due to loss of income.[725] Thus, whatever form ASGM takes, the underlying push factors such as poverty and intended goals oftentimes remain almost the same.

The study argues for characterizing ASGM as a livelihood strategy to alleviate poverty. The miners themselves view ASGM as a self-employment initiative and an activity to generate income. This approach to ASGM was previously recognized in 2002 in a global report on ASM commissioned by the IIED.[726] It was observed that the operations were self-organized and regulated even though their activities were undertaken under difficult economic conditions. This evidence clearly shows that the practice demands more attention from the government and other key role players to formalize and regard it as a viable source of income.

At the same time, it seems that ASGM also perpetuates poverty. The researcher observed a myriad of negative factors that exacerbate poverty, such as lack of a culture of financial saving, local inflation and imminent evictions or raids. This finding confirms the claim that miners hurriedly spend their money on luxury, alcohol and consumer goods.[727] Lack of long-term

[724] Hentschel, Hruschka & Priester (note 110 above) 5.
[725] Hinton (note 198 above) 5.
[726] Hentschel, Hruschka & Priester (note 154 above) 63.
[727] Bannock Consulting Ltd 'Vulnerability of Artisanal and Small-Scale Mining to Commodity Price Fluctuation' PAPER 3: Price and Other Risks in the Artisanal and Small-Scale Mining Industry (2006).

investment plans on the part of artisanal miners indicates despair and indifference to the system governing ASGM in South Africa which side-line, marginalize and criminalize the activity. Lack of discipline and ruthlessness are the result of desperation to attain an income. Poverty is hence driven by forces that conceal the undercover local and international syndicates controlling and exploiting the sector, disadvantaging the miners and depriving the South African fiscus of a potentially valuable stream of tax income. Although the debates and narratives on ASGM issues have been undesirable and deleterious, there have been numerous positive accounts and benefits that have been realized. The most significant recognition is that the consequences of this sector affect individual community members in a multi-dimensional fashion in both a negative and positive manner.

The conceptual framework depicted in Figure 6.1 is informed by the research findings and focuses on the relationships between ASGM and sustainable livelihoods. The framework is directed and guided by the views under the DFID's Sustainable Livelihood Framework. The ultimate proposition of this conceptual framework is reinforced by the practical results of ASGM activities and how the operations transform people's livelihoods by building capabilities that empower them to deal with the imminent risks that may make them susceptible.

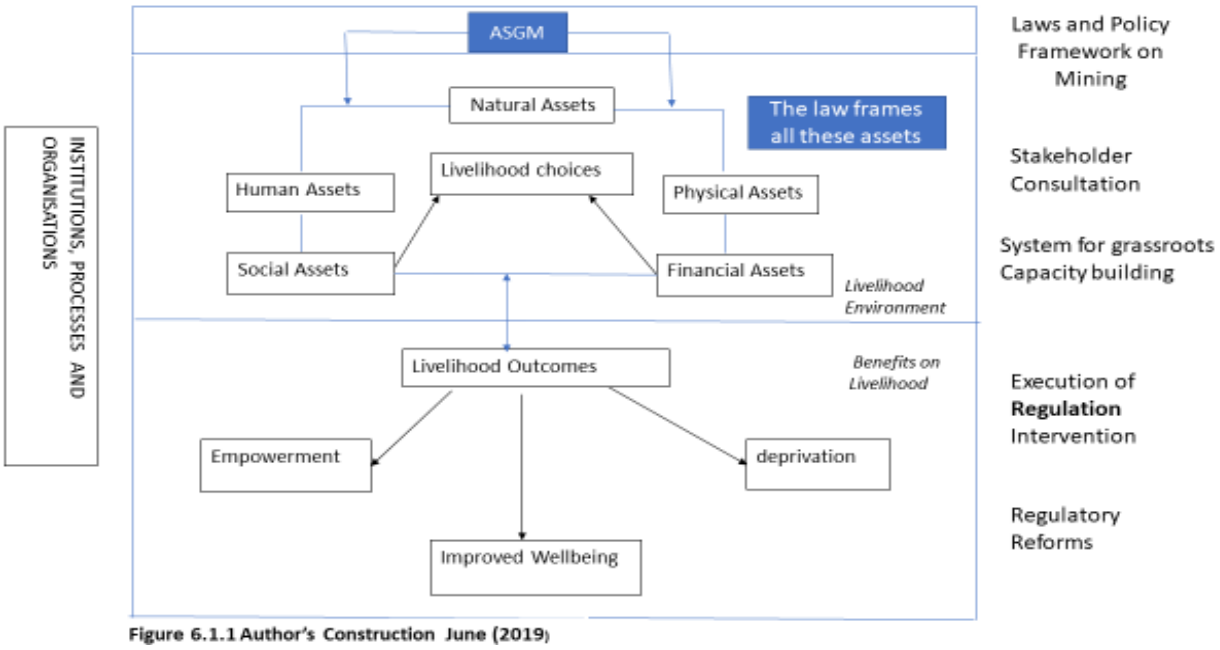


Figure 6.1.1 Author's Construction June (2019)

Figure 6.1.1 Nexus between ASGM and livelihoods

The livelihood framework highlights the importance of assets/capitals (natural, financial, social, human and physical assets) which are vital for the existence and sustenance of people in mining as it ensures coping mechanisms in the face of shocks and risks. These livelihood assets are in turn influenced and framed by the law, affecting the capacity of people to adapt, endure, cope and remain resilient.

Natural capital encompasses the natural resource assets (gold, land, water resources, and air) from which resource flows and useful services beneficial for livelihoods emanates. Environmental degradation and pollution of land, air and water in the quest for artisanal gold were witnessed as negative impacts. Essential to note is how the law ring-fences these varied stocks. Natural assets like other livelihood assets are regulated by several laws, thus access, control and use thereof is restricted to persons with the legal right. The sector depends on access and use of these stocks to have a meaningful and sustainable livelihood in mining.

Human capital is the active labor, skills, knowledge and good health status and physical fitness and ability considered essential in the prosperous quest of diverse livelihood strategies. The need for skill in this sector is paramount for the realization of livelihood outcomes. Failure to inculcate requisite knowledge in all phases of mining might omit one's fortune towards achieving empowerment to the law nevertheless profoundly influences the use of and access to

human assets and outline offenses and penalties to be imposed on offenders. These laws amongst others as discussed in Chapter 5, include the Immigration Act; Children's Act; Mine, Health and Safety Act; and Occupational Diseases in Mine and Works Act.

Physical capital comprises of the primary systematic and structural infrastructure and basic operational goods required to support and maintain livelihoods. Physical capital from this viewpoint represents affordable, adequate, and secure transportation, sufficient water supply and sanitation, cheap sources of energy, access and use of hazardous substances, firearms, and explosives. Physical capital requires investments in tangible objects that assist people to meet their fundamental needs and undertake useful activities effectively and efficiently. The law frames the physical assets by prohibiting the use, access and control of such without a license. As indicated in Chapter 5, laws regulating physical assets include Explosives Act, Hazardous and Substance Act as well as the Firearms Control Act. Findings have confirmed that miners lack capacity to meet the requirements of various laws due to lack of financial resources, information, and proper legal identification.

Social capital includes networks, social relations, access to health care services, private security and national heritage resources that enables the miners pursuing a livelihood activity to act in a coordinated manner. Again, social sustainability ensured cohesion and mutuality to exist, but challenges emanated from the transitory nature of the operations which disturbs the basic framework of the society. Social capital, therefore, helps in recognizing and accepting one another in a community, allowing individual members to identify and engage themselves with the structures, norms, values and beliefs of the host community. The law generally facilitates regulations to safeguard relations, associations, affiliations and even access to particular societal structures. Hence, the Labor Relations Act, National Health Act, the Private Security Industry Regulations, and other Acts seek to ensure long-term cohesion and mutuality within the mining community.

Financial capital refers to the capital base (cash, credit or debt, savings, and other commercial assets), which are crucial for the attainment of any livelihood activity. Most miners as indicated in Chapter 4 for instance, borrow money from informal and illegal money lenders to supplement their incomes. The miners consume the capital and fail to profitably use the value accrued. This had a negative effect on the sustainability of ASGM as a livelihood strategy. Financial assets are ring-fenced by several laws such as the Income Tax Act, the Bank Act

together with the Mineral and Petroleum Resources Royalty Act. Miners are required to submit requisite documents such as proof of occupation, company registration and personal details as well as proof of personal income. However, miners lack the capacity to acquire and access financial support and markets due to incapacity towards the required conditions stipulated in respective laws.

Through formal and informal rules, the assets listed above, relationship between ASGM activities, livelihood assets, legal structures play an important part in empowering or impoverishing ASGM miners. The interaction of actors, assets and the external environment may augment or reduce livelihood risks. Behind the assets, it is institutions such as normative structures, culture, legal frameworks, and policies that ultimately support or impede ASGM. Government policies, regulation, laws and local plans play significant roles in guiding the activities of ASGM in communities and influencing how each capital is utilized to enhance livelihoods.

The human, social, physical, natural and economic capital and its relationship with livelihoods determine the choices people embrace about how to manage, reduce, and manage risks and shocks in mining communities. The critical junction of these factors is that they determine the sources of livelihoods of people and how they manifest in their lives. Choices as to how to improve wellbeing consequently are enabled by the institutions, policies and processes where the nature of livelihoods in communities becomes apparent in promoting empowerment, sustainability or deprivation.

6.2 ASGM and Effects on Livelihoods

This section discusses the empirical and legal findings and how they relate to the claims made regarding ASGM's negative and positive contribution to livelihoods. ASGM has been described as a strategy that alleviates poverty by creating an alternative meaningful employment for many people with little or no capital. At the same time, due to the specific and ineffective legislation, the sector is associated with negative environmental, socioeconomic, safety and health externalities. Evidence from the fieldwork suggests that poverty has been perpetuated by the informal and illegal nature of ASGM.

The adoption of a livelihoods framework, as this thesis argues, will not only enable the sector to realize the positive impacts of ASGM, but will facilitate a response to the following negative impacts. The negative and positive impacts of ASGM entail fundamental actions emanating from livelihood choices. These results either induce impoverishment or enhance empowerment. Livelihood choices as indicated by the up-down arrow in Figure 6.1.1 above can intensify or lessen poverty but must be viewed within the community's natural, physical, and socio-economic endowment. Institutional policy and processes play a vital role in the management of ASGM activities. The wellbeing of the people is ultimately affected also by community institutional structures and organizations.

Negatively, ASGM poses serious negative impacts for the community and on the natural environment within and around the people. These risks comprise, but are not restricted "to risks to culture, loss of territory, exposure to diseases, loss of traditional livelihoods, and loss of control to outsiders".[728] As a result, institutional and organizational conditions are vital for handling and minimizing negative impacts at the same time promoting livelihood development. For example, a robust law enforcement agency could have averted serious negative externalities by simply implanting the law instead of engaging in bribery and corruption. Negative externalities have been further exercabated by arduous conditions within various legislations as discussed in Chapter 5. ASGM undertakings in the long run can end in substantial positive impacts. The outcomes of the effects are hypothesized under empowerment and deprivation in Table 6.1 below and the discussion thereof.

The framework (Figure 6.1 above) also categorizes two key impacts of ASGM undertakings on communities as deprivation and empowerment which ultimately leads to well-being. Empowerment is a desirable outcome which can be attained by reforming the regulatory framework and facilitating the implementation of formalization measures. Therefore, empowerment is enabled and capacitated by having legal mining rights, access to financial support, markets and technological support. Deprivation and empowerment are a product of the available assets and the livelihood choices that a community adopts. Thus, matters of deprivation, such as land degradation, pollution and safety hinder miners from engaging in a sustainable livelihood. Moreover, the lack of access to livelihood assets limits and diminishes

[728] Hentschel, Hruschka & Priester (note 110 above) 43.

the community's ability to cope and adapt to shocks to achieve a sustainable livelihood outcome.

6.2.1 Contribution of ASGM (Empowerment and Deprivation)

The impacts of ASGM are summarized in Table 6.1 below. The focus of this sub-section is on the actual livelihood outcomes rather than on the general impacts of ASGM. Therefore, a cost-benefit aspect of ASGM covering the wide spectrum of positive and negative impacts of the sector are spelt out below.

Table 6.1. Cost-benefit aspects of ASGM

Empowerment (Positive)	**Deprivation (Negative)**
Natural ▪ Appropriate information about the gold ores.	*Natural* ▪ Destruction of aesthetic nature, soils and plant species ▪ Destruction of forest lands ▪ Water, and land pollution
Human ▪ Growth of innovative skills ▪ Empowerment and educational programs on livelihood	*Human* ▪ Prevalence of sexually transmitted and communicable diseases ▪ Mercury pollution ▪ Increased lung infections ▪ Disturbances in children's formal educational activities
Economic ▪ Improved access to credit ▪ Improved food security ▪ Access to income and improved household supplies	*Economic* ▪ Tragedy of the commons (excludability and subtractability) ▪ Corruption by the miners, buyers and law enforcement agencies ▪ Absence of collateral security ▪ Lack of long-term planning results in high cost of living ▪ Failure to adapt to technological changes

Social and Physical ▪ Increased resilience ▪ Enhanced social cohesion and inclusion ▪ Increased demand for investment ▪ Provision of socioeconomic infrastructure ▪ Capacity training for local and traditional authorities ▪ Provision of local governance infrastructure; for example district office information centers ▪ Increased networking and civil society activities	*Social and Physical* ▪ Increased exposure to risks due to limited social amenities ▪ Increased exclusion and discrimination of women ▪ Substance abuse ▪ Insecurity ▪ Child labor Loss of community identity because of destruction of cultural and ethical values ▪ Loss and neglect of civil and human rights ▪ Destruction of cultural heritage sites ▪ Increased domestic conflict on ownership of resources

Table 6.1 Author's Construction

6.2.2 Understanding the consequential impacts

This sub-section seeks to further state and analyze the negative impacts that have characterized ASGM. This sub-section focuses on the effects of negative externalities particularly on the land, water, human health and the socio-cultural environment to partly infer the extent of the threat posed towards livelihood assets.

Land Degradation

ASGM creates several environmental related impacts. The researcher observed that the land was no longer useful for other purposes. This finding confirms the claim earlier made by Gunson & Jian regarding mined land being left desolate, unable to be utilized for other activities such as farming.[729] There are so many challenges that are associated with land

[729] Aaron J Gunson & Yue Jian 'Artisanal mining in the People's Republic of China' International Institute of Environment and Development, Draft Report (London 2001).

degradation. The researcher observed that road infrastructure, availability of debris and tailings, deforestation were amongst the problems caused by mining in Johannesburg at present. The South African Human Right Council states that the "Department of Minerals and Energy is inundated with blasting and vibration related complaints by communities located near the disused mines".[730]

Water and land Pollution

The researcher witnessed first-hand how miners release hazardous and perilous elements of mercury. Therefore, pollution into the broader environment is inevitable because there are no mechanisms to reduce or prevent pollution of water and air. Mercury has been found to have acute toxic effects on the neurological system.[731] As Spiegel and Veiga point out that, "mercury amalgamation results in the release of an estimated 1 000 tons of mercury per annum into the ecosystem of developing countries".[732] The researcher submits that mercury is so widely used because it is convenient, accessible and easy to use. However, the miners are not mindful of, or decide to disregard, the health risks associated with mercury, both for themselves and the broader community. Thus, all the emitted substances of mercury are then found within the atmosphere and can cause neurological problems in humans. The findings resonate with the claims by the Alliance for Responsible Mining that the use of heavy substances such as mercury can later be found in water resources thereby causing damage to humans and aquatic life.[733]

Safety Issues

The researcher discovered dangerous and precarious pits and dugouts that are usually not rehabilitated. Health risks associated with this discovery causes physical harm and affect the vegetation. The research participants were indifferent and mindless about their safety. There was no priority put on personal safety, instead the major concern was about getting into the mine shaft and start mining. Since it was observed that each member of the family had a role

[730] South African Human Rights Council (note 58 above).
[731] Gavin Hilson & Sandra Pardie 'Mercury: an agent of poverty in Ghana's small-scale gold-mining sector?' (2006) 31 *Resources Policy* 106-116.
[732] S J Spiegel & M M Veiga 'Building capacity in small-scale mining communities: health, ecosystem sustainability, and the Global Mercury Project' (2005) 2 *EcoHealth* 361-369.
[733] Alliance for Responsible Mining (2013).

to play, Bodenheimer's claim that children are also involved in ASGM[734] was confirmed by the research findings.

Moreover, the safety of miners themselves had been often at risk. The researcher observed the gold miners making their way by crawling into the abandoned, unsafe and unstable mining shaft. Proper personal protective equipment (PPE) and the use of proper tools to protect miners from inhaling toxic gases, rock falls and other physical harm was disregarded. Miners were observed entering into the derelict shaft through secured and also unprotected entrances or openings.[735] Safety is compromised, perhaps as a result of an existing culture of criminality and desperation for quick gains.

Health Issues

The mining process exposes communities to unrehabilitated land and stagnant water. This stationary water provides fertile ground for mosquitoes. Although Yelpaala & Ali claim that it is that stagnant water is a cause for malaria, several abandoned mines contain pits full of water.[736] Abandoned tailings dams created by formal mining were seen within the mining sites. The researcher observed also as mentioned earlier, the miners typically handling mercury imprecisely and carelessly without protective clothing, and often inhaling toxic mercury vapors while distilling gold blend. The contraction of diseases was imminent as miners lack education and guidance about working conditions. As mentioned by Hentschel *et al* the use of harmful substance is due to the lack of training.[737] However, miners indicated that they were aware of health risks associated with the use of harmful substances. This mercury toxicity is found to be the most dangerous health and environmental impacts in the ASGM and other levels of the mining sector. Regrettably, the participants were not cognizant of these exposure parameters.

Sociocultural

The social fabric reputation within and around the mining areas is bad. The researcher witnessed immoral and unlawful activities such as prostitution, corruption and substance abuse.

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[734] Bodenheimer (note 167 above).
[735] D Limpitlaw *et al.* 'Post-mining rehabilitation, land use and pollution at collieries in South Africa' (2005) 13 *Colloquium: Sustainable Development in the Life of Coal Mining, South African Institute of Mining and Metallurgy, Boksburg.*
[736] K Yelpaala & S H. Ali 'Multiple scales of diamond mining in Akwatia, Ghana: addressing environmental and human development impact' (2005) 30 *Resources Policy* 145-155.
[737] Hentschel & Priester (note 154 above) 37.

The researcher observed miners smoking and drinking certain substances before they entered the shaft. Furthermore, the participants indicated that prostitution was rife, especially within and around the informal settlements where miners dwell. The association of ASGM and sociocultural problems, as Gyan-Baffour pointed out, is fuelled by miners' spending their little savings on alcohol, gambling and prostitution, which leads to a breakdown in law and order.[738] Their little resources are therefore carelessly spent, thereby perpetuating poverty. It is also worth to note that sexually transmitted diseases like HIV/AIDS result from prostitution and ASGM encourages prostitution to take place. The presence of mining in communities can disrupt values, beliefs and indigenous cultures and eliminate traditional livelihoods. The consequences for livelihoods hinge on how formal institutional policies and programs are implemented and translated to benefit the people in mining communities.

6.3 Implications for Regulating the Sector

Based on the consequential impact of ASGM operations, starting assumptions are vital. Policy responses can be based on two broad assumptions about the character of the sector: firstly, that it can lead to empowerment; and secondly, that it can lead to deprivation. Different policy responses flow from these different starting points.

6.3.1 Empowerment

Undertaking ASGM can result in several benefits that uplift and lead to development and capacity building. The anticipated outcome essentially seeks to boost and sustain gains that are accumulated by ASGM activities while at the same time reducing associated risks. Therefore, these measures include holistic review of the regulatory framework in relation to education, training, access to capital and markets, as well as capacity building to build the capability of ASGM. Legalizing ASGM could open up so many other avenues for legal operation such as a special skills visa for foreign-based artisanal miners. At the moment, the artisanal miner trade category can be recognized under general work visa but not under the critical skill visa. Section 18 of the Immigration Act stipulates that the prospective employer, accompanied by the certificate from the Department of Labour shall confirm that the employer has not been able to

[738] Gyan-Baffour (note 149 above) 4.

find suitable skill equivalent to the applicant from the citizen or permanent resident.[739] In this way we would cancel out much of the illegality around the assets. Miners would have identification documents, would need to pay taxes, could open bank accounts and so forth. However, the nature of ASGM work still falls under prohibitive regulatory regime and have forced the artisanal gold mining industry to remain vulnerable to exploitation and criminality

Licensing and regulating ASGM

The ASGM regulatory framework is a key formalization process whereby various types of ASGM activity can be legally recognized. Many of the problems of illegality flow from the fact that the activity and access to the resources are inherently legal because the state simply fail to regulate this aspect of mining. These problems include environmental, occupational health and safety mismanagement, illicit trade, gold smuggling, turf wars, abuse of women and children The ASGM sector is likely not ever to be formalized under the similar legal arrangements appropriate to LSM, and so distinct legal provisions for formalizing ASGM should be established.[740] In doing so, actions can be sanctioned to avert environmental and socioeconomic mismanagement. The laws and regulations should deal with the challenges of ASGM, simplify registration processes and heighten the control of the negative impacts of ASM on the environment. Thus, aspects attached to the license would include a tax regime or system of fees and royalties, measures on environmental management, occupational, health and safety, pollution control as well as mine closure and land rehabilitation. Other considerations would relate to duration, renewal of licenses, eligibility, rights and obligations as well as transfer and upgrades of license.

The MPRDA puts all mineral resources under the custodianship of the state. However, it does not differentiate between different mining categories, a mining permit therefore allows anyone to conduct small-scale mining. The DMR distinguishes small-scale mining into 3 types; "artisanal or subsistence mining operations, sub-optimal formal operations and entrepreneurs with up-front capital".[741] Challenges such as complex administrative processes, difficult financial requirements, duration and areal extent restriction have hindered progress towards

[739] Section 18 of the Immigration Act of 2002
[740] World Bank 'Program for improvements to the profiling of artisanal and small-scale mining activities in Africa and the implementation of baseline surveys' (Washington DC: World Bank 2004).
[741] DMR 2017.

empowerment of ASGM players. The State is not fulfilling its custodianship role because it is failing to regulate ASGM.

Access to markets

Government should also put in place measures to transform the informal existing controls to markets by facilitating open access to markets to curb monopoly and exploitation. One of the challenges of ASGM formalization raised in Chapter 2 is the lack of access to formal markets. The study exposed that the miners had no access to different gold buyers and also lacked bargaining power, therefore, they were under market exploitation. Even developing countries such as Zimbabwe have introduced a gold-buying programs, value adding activities and simplified trade requirements.[742] Due to the illegality and informality of ASGM operations in South Africa, access to formal markets is a big challenge. Marketing opportunities have been stifled by the lack of marketing skills, access to technology and finance to compete as most of the ASGM rely on word-of-mouth as a means of marketing.

Education in ASGM

ASGM in most instances has been poorly performed, resulting in its full benefits not being recognized. Several reasons have been raised earlier that have led the miners to disregard or fail to adhere to legal requirements resulting in mercury pollution, increased deprivation and financial difficulties. One of the key explanations is lack of education and zero or little technical assistance. Education promotes empowerment because miners acquire the knowledge and skills. For example, in South Africa, Mintek (Council for Mineral Technology) oversees technology transfer research and development and provides training and support.[743] The Mintek's Small-Scale Mining and Beneficiation (SSMB) established the Artisanal and Small-Scale mining school that has trained above 2000 participants countrywide since its inception in 2004.[744] The training programs that were offered included safety and health, small-scale mining, surface and underground mining.[745] Furthermore, skills programs, qualifications and

[742] Dzimunya et al (note 299 above).
[743] https://www.mintek.co.za/technical-divisions/small-scale-mining-beneficiation/
[744] Mining Weekly Online. 2009. 'South African courts now recognise illegal mining as organised crime' http://www.miningweekly.com/print-version/sa-courts-now-recognise-illegal-mining-as-organised-crime-2009-11-13, ' Accessed 30 July 2020.
[745] Ibid.

learnerships have been developed by the Mining Qualifications Authority (MQA) and has led to learners receiving technical training in small-scale mining.[746] Still, it has been reported that the training exercise has been stopped due to unclear and invisible impact on the sector.

In Papua New Guinea, capacity building programs for small-scale miners has delivered specialized training to sustain and empower through offering courses in business development, mercury use, occupational health and safety, and understanding the legal framework.[747] It is, therefore, essential to invest much more in education and training so that the ASGM sector is run and conducted by persons with a better understanding of things that matter.

Access to financial support

Lack of access to financial support hinders productivity and allows illicit actors to exploit miners as they monopolize the gold price and the trade of gold. On the other side, environmental benefits, ability to reduce mercury use and emissions and women's involvement can be predicted to be achieved through the access to financial support. Thus, through financial needs assessment, the government would be able to develop micro-finance policies and identify interested financial institutions to fund and assist the ASGM sector to acquire loans to buy critical equipment.

Dreschler indicates that there are three options for funding in South Africa. These are government programs, donor initiatives and the buyers themselves.[748] The common channel for funding is done by the gold or mineral buyers through direct financial resources and equipment. However, due to inequalities and negotiating powers, exploitation has resulted as miners succumb to predetermined prices. While on the other side, government through the DMR, established the National Steering Committee of Service Providers (NSC) to assist and support miners financially and technically, to purchase equipment and to assist in day-to-day costs.[749] Due to poor outcomes, the NSC initiative was withdrawn and substituted by the Small-Scale Mining Board (SSMB) in 2006. Solomon submits that 20 small-scale mining operations were allocated R15 million.[750] Despite the fact that initiatives to support small-scale mining

[746] Mining Qualifications Authority (MQA), 'Sector skills plan for the mining and minerals sector submitted by the Mining Qualifications Authority (MQA) to the Department of Higher Education and Training 2014' 27.
[747] UNITAR & UN Environment, 'Handbook for Developing National ASGM Formalization Strategies within National Action Plans' (UNITAR & UN Environment, Geneva, 2018).
[748] Dreschler (note 148 above).
[749] DMR, 2011.
[750] M Solomon 'The rise of resource nationalism: A resurgence of state control in an era of free markets or the legitimate search for a new equilibrium? A study to inform multi-stakeholder dialogue on state-participation in

technically and financially were put in place, positive impacts and the general outcomes are not yet noticeable due to the absence of managerial and entrepreneurial skills on the part of a miner as well as the lack of DMR capacity to monitor and support projects.

Geological survey and allocation of land

Unavailability of suitable land with gold deposits for ASGM hinders formalization. The establishment of ASGM zones affords miners access to mine on specified areas. Therefore, the government should conduct land use mapping with stakeholders, conduct geo-prospecting so as to reserve and allocate land suitable for ASGM on a first come, first served basis. In South Africa, the Council for Geoscience (CGS) renders geoscience information about the earth, its evolution and resources. The Geo-Science Act 100 of 1993 created the CGS to provide geo-science knowledge and services, geological data of the earth's surface and resources. [751]

Facilitating the organization of miners

Empowerment of ASGM miners can be reinforced and enhanced by legitimate structures such as associations, partnerships and cooperatives that provide support through financial, vital market information and technical training. An example of a collaborative model is the tribute system between LSM and ASM in Zimbabwe Zimasco chrome mining where small-scale miners get support in the form of funding, training and equipment.[752] Miner's organizations might also deliberately target women to assume leadership positions in ASGM. Furthermore, well established entities will enable miners to be identifiable to access any support. Therefore, a socioeconomic study should be conducted to provide important information that will encourage the development of a suitable institutionalized system or entity. The legal framework can be amended to accommodate various options for the miners' organization.

In South Africa, the interests of the ASGM are represented by the Mining Affected Communities United Action (MACAU), National Association of Artisanal Miners[753] and the Northern Cape Artisanal Miners Association (NCAMA). The MACAU advocates for the

mining. Southern African Institute of Mining and Metallurgy, Johannesburg' last accessed at http://www.saimm.co.za/Conferences/ResourceNationalism/ResourceNatio nalism-20120601.pdf on 11 August 2020.

[751] Geo-Science Act 100 of 1993.

[752] Dzimunya et al (note 299 above).

[753] J Khumalo 'Make zama-zama legal' *Daily Sun* 31 January 2020, last accessed from https://www.dailysun.co.za/News/make-zama-zamas-legal-20200130 on 2 August 2020.

scrapping of the MPRDA, the 2017 Mining Charter and the decriminalization of 'zama-zama' and seeks the mining legislative processes to allow miners to conduct mining on abandoned mines.[754] The NCAMA has been created to promote and campaign for the formalization and regulation informal miners within Northern Cape. The association seeks to provide health care and pensions to its members. The members are also mandated to pay taxes from their income. Cooperatives such as the Batho Pele in Kimberly have been formed to assist informal miners sell their produce legally.[755] However, the decriminalization and formalization efforts pursued by several miners' associations and organization have been mostly unsuccessful due to lack of an integrated approach and legitimacy.

Decentralization of national government structures regulating ASGM

Based on literature relating to approaches to ASGM formalization discussed in Chapter 2,[756] a community-based approach and private property regimes can help to respond to sensitive local needs and simplify bureaucratic processes and paperwork. Establishment of registration offices in several areas and an increase of government officials can be fast-tracked by employing small governments – local or district offices to issue licenses, thus enhancing accessibility to registration processes. To this end, another measure on ASGM formalization such as gold trade and registration of mine claims will facilitate and encourage a willingness to operate legally. Lastly, decentralized structures champion effective communication where delays and other mining related problems are identified, reported, diagnosed and collectively resolved within a short space of time.

The development of the ASGM sector is critically linked to institutional support and coherent structures. These structures are essential to provide solutions to the challenges facing the sector from a multi-pronged approach. The government of South Africa through the DMR has established structures to facilitate in the expansion and development of the sector. As mentioned before, these include, the "National Small-Scale Development Framework of (1999)", National Steering Committee (2000), "Small-Scale Mining Directorate (2004)" and the Small-Scale Mining Board (2006). While most of the institutional support has been

[754] A Mitchley 'Illegal mining should be made legal-zama zama miners' *NEWS 24* 15 August 2017, last accessed from https://www.news24.com/news24/southafrica/news/illegal-mining-should-be-made-legal-zama-zama-miners-20170815 on 9 August 2020.
[755] Mari 'Can we afford zama-zamas?' *Mining Mirror* 6 February 2019, last accessed from http://miningmirror.co.za/2019/02/06/can-we-afford-zama-zamas/ on 9 August 2020.
[756] See Section 2.3.3.2 & 2.3.3.3 of Chapter Two of this thesis.

discontinued, the DMR through the Directorate of Small-Scale mining assist small-scale operations by offering assistance regarding the "establishment of legal entity, guidance towards the identification of mineral deposits, mining feasibility study, reserve estimation of the selected deposits and market study."[757] However, several challenges continue to crop up because there is a lack of stakeholder collaboration, an inappropriate top-down approach and poor funding.[758] Limpitlaw and Hoadley, posits that in South Africa most support is at the regional level and therefore, there is a need to increase representation at the grassroots level.[759]

6.3.2 Deprivation

Deprivation is the other livelihood outcome associated with the negative impacts of ASGM. Therefore, formalization of ASGM should incorporate policy measures aimed at reducing and eradicating the risks and providing interventions that would address issues such as use of mercury, child labor, and gender discrimination. Dreschler states that, "extensive development of knowledge and scientific research show that rehabilitation and restoration of livelihoods are more likely when all potential impoverishment risks are identified early and arrangements are made to mitigate or avoid them."[760] Thus the LSM can assist in building capacity that will inevitably result in minimized illegality, mitigation of the negative impact and the enhancement of sustainable livelihood programs. As discussed below, capacity building enables an understanding of the legal framework, protection of the environment, skills development, access to legitimate channels for extracting, processing and sale of minerals , and good health and safety standards.

Dealing with mercury use

Generally, the ASGM activities affect the environment negatively. It is important to emphasise aspects such as 'increased awareness about mercury exposures and hazards, establishment of environmental management training, making environmental training a prerequisite for accessing hire purchase loans for equipment and making environmental impact assessments

[757] DMR last accessed at http://www.dmr.gov.za/mineral-policy-promotion/small-scale-mining#:~:text=The%20Directorate%20of%20Small%2DScale%20Mining%20assists%20aspiring%20small%2Dscale,the%20identification%20of%20mineral%20deposits%3B&text=Development%20of%20the%20mining%20equipment on 11 August 2020.
[758] AMV 2009.
[759] Hoadley & Limpitlaw (note 194 above).
[760] Dreschler (note 148 above).

(EIA) mandatory before any mining project can be undertaken'[761]. So, through a legal framework, appropriate pollution measure such as the polluter pays principle may be effected. Furthermore, processing plants that do not use mercury might be commissioned by relevant institutions as a significant approach to deal with mercury use in the formalization progress coupled with other measures such as ad-hoc monitoring and inspections to reduce its use and mitigate its impact. The elimination and reduction of mercury use in South Africa has been a topical issue, particularly for gold mining.[762] Technologies to reduce mercury use that have been introduced include the ThermEx and iGoli mercury-free technology (which uses "pool acid and bleach to extract gold"). However, due to the cost involved, the perception of the miners, lack of consultation and inadequate support, miners have failed to adopt the technologies to reduce mercury use.[763] Lastly, continuous educational programs documenting toxic and hazardous effects, especially towards women and children should be made compulsory by all stakeholders.

Empowering and protecting women

Empowerment of women is an essential socioeconomic measure in ASGM formalization. The sustainable development Goals (SDGs) promote gender equality, therefore formalization of ASGM, which has a global estimation of 5 million directly involved women[764] can contribute to sustainable development. A state-sponsored survey on ASGM actors could assist in identifying the reasons for gender imbalance and inequalities as well as identifying gender-based risks. Ultimately, upon realizing these factors, several mitigation programs and opportunities to champion women empowerment and gender equality can be promoted. Therefore, having investigated women's status and position within the ASGM sector, the root causes for vulnerability need to be addressed through promoting and facilitating participation in decision making, eliminating legal barriers, and affording equitable access to training and financial support.[765]

[761] Dzimunya et al (note 299 above).
[762] Common Fund for Commodities 'Regional Workshop: Small-scale Mining in Africa - A Case for Sustainable Livelihood' 2008.
[763] N Mutemeri, *et al*. 'Capacity building for self-regulation of the Artisanal and Small-Scale Mining (ASM) sector: A policy paradigm shift aligned with development outcomes and a pro-poor approach' (2016) 3.3 *The Extractive Industries and Society* 653-658.
[764] https://web.unep.org/globalmercurypartnership/our-work/artisanal-and-small-scale-gold-mining-asgm
[765] Eftimie, et al. (note 221 above).

Protection of Children in ASGM

Formalization of ASGM is one approach amongst many multi-pronged measures to tackle child labor. Children, like adults are involved in physical tasks that have negative health consequences such as muscle pain which could emanate from manual crushing and respiratory diseases from the exposure to dust and fumes. Children's role and motives are an important aspect to be investigated. The current study revealed that child labor is not voluntary but, indirectly forced. Child labor is estimated to escalate unless alternative sources of income and improved access to education is guaranteed.[766] Moreover, child labor can be dealt with by monitoring the ASGM supply chain and improving access of ASGM communities to social protection programs and adopting befitting regulations to safeguard children from hazardous practices. As evidenced in Section 4.1.4 of this thesis[767], participation of children in ASGM directly or indirectly can be managed effectively through the integration of grassroots stakeholder efforts under ASGM formalization banner.

Dealing with supply chain and a culture of saving

In dealing with smuggling and exploitation of ASGM miners, supply chain management facilitates equitable trade, raising awareness and building capacity of understanding local gold supply chains and helps in discouraging corruption, money laundering and bribery. Therefore, gold buying programs are important elements of formalization. Lessons from Ghana, Peru and Mongolia show that if middlemen have too much power, miners will be underpaid as they will have no or few alternative markets. This affects miners' savings as they indirectly lead to reckless spending due to lack of long-term planning, lack of bargaining power and over exploitation of labor.

Security

Formalization of ASGM can contribute to the creation and enforcement of the rule of law. Since the sector is associated with criminal activities such as illicit trade, the use of force to demilitarize mines might be a solution to monitor and enforce ASGM regulations. The presence of armed and unregistered security personnel around the mining sites is a witness of systematic

[766] P Chuhan-Pole, A L Dabalen, & B Christopher Land 'Mining in Africa: are local communities better off?' (The World Bank, 2017).
[767] Section 4.1.4 of Chapter Three of this thesis.

violation of Private Security Industry Regulations. In light of increasing turf wars, continued perpetuation of exploitation of miners by enforcing strenuous and unsustainable informal rules, the existence of unregistered security can be dealt with by initiating consensus building by reinforcing relationships between stakeholders. These stakeholders need to resolve conflicts and formalize their existence include, the local community, local and national government, law enforcing authority.

The sub-section above focused on the implications for regulating the sector. Several elements have been discussed that promote empowerment, such as education, access to finance and markets. Again, a number of elements of deprivation have been raised and how these can be dealt with have been the discussed. Having discussed the two assumptions that can materialize as livelihood outcomes, it is imperative to shift the focus towards the law and ASGM.

6.4 The law and the ASGM

This subsection analyses how the law in South Africa impedes ASGM from becoming a sustainable livelihood. Results derived from the fieldwork processes and legal analysis indicates that most miners do not have the capacity to meet the requirements of several regulations. The ASGM sector in South Africa can be considered complex owing to a myriad of challenges which range from the social, to the economic and environmental. Some of the legal challenges have according to the respondents contributed indirectly to the precarious conditions in which miners find themselves. These challenges amongst many resonates with the earlier claims from the literature survey and include an inadequate policy and legislative framework.[768] Moreover, the SAHRC also submits that bureaucratic costs associated with the regulatory and administrative responsibilities are hindrances embedded within the legislative structures.[769] While Mutemeri & Petersen, state that absence of and inaccessibility to financial resources and limited market opportunities; inadequate technical capacity and access to suitable technology; the nonexistence of institutional support; inadequate training opportunities; lack of information; and weak governance further constrains and impedes ASGM from becoming a sustainable livelihood.[770] At present, it is difficult to pursue ASGM as a livelihood strategy in South Africa, because the activity contravenes several laws such as the MPRDA, NEMA,

[768] L Putzel et al. 'Formalization of natural resource access and trade' (Center for International Forestry Research 2014).
[769] South African Human Rights Council (note 58 above).
[770] Mutemeri & Petersen (note above 50).

Precious Metals Act, Hazardous Substances Act, the Immigration Act and the National Small Business Act, as discussed in Chapter 5.

6.4.1 Legislative Framework

As explained in this thesis, the MPRDA (as the primary legislative framework for ASGM) does not differentiate between artisanal small-scale, and other levels of mining. Several negative effects such as a general treatment of different role players have resulted within the sector due to the failure to distinguish ASM from other forms of mining. An ASGM applicant for a mining permit is required to submit an environmental authorization and rehabilitation guarantee while a mining license for LSM is issued upon the applicant applying for an environmental authorization, Social Labor Plan (SLP), and financial guarantee for rehabilitation. Some regulatory requirements are burdensome and unbefitting to the level and scale of activities that the miners undertake, even though they are very important in so far environmental management is concerned. Arguably, the motivation to subject mining activities to fit, especially into an environmental regulatory framework as the LSM is a management approach to safeguard against the harmful effects of ASGM on personal safety, health and the general environment. The argument of this thesis is that ASGM needs distinct and separate regulation, based on its particular economic, developmental and social features. Thus, the law can be the vehicle to redress the anomaly whereby a distinct categorization is made coupled with appropriate procedures and processes to obtain a mining permit. Therefore, this would assist in executing the relevant legal measure towards any undertaking regarded as illegal and criminal because they fail to meet the requirements.

6.4.2 Mining Permit

The legal research identified that the current legal system has left ambiguities in the regulatory framework, such that an ordinary small-scale miner would not be able to meet the minimum conditions. The introduction of a mining permit for small-scale miners was a noble intervention. However, ASGM miners under study were faced with a huge challenge to acquire the mining permit. As witnessed during the fieldwork research, income gained from mining is quickly and easily depleted with little or no savings. There are no incentives for the miners to consolidate the paperwork and other resources to obtain a mining permit. A number of the MPRDA requirements become a barrier towards miners' participation due to the fact that the

capital needed to complete the paperwork is hefty. The two main examples of these are the feasibility study, which often requires obtaining and securing sources of water, and the environmental impact assessment which can only be done by experts with high consulting fees. Accessibility to finance as stated in the literature review is a challenge mostly faced by miners because they lack collateral and proper identification that can enable them to borrow money.

6.4.3 Environmental Management

The environmental management matters and obligations are regulated by the National Environmental Management Act (NEMA) 1998. According to Section 2, "the NEMA provides for the relationship between itself and other organs of state and legislative instruments, on how the law should be interpreted for planning and implementation of environmental management."[771] Environmental provisions regarding mining are also directed by the MPRDA. The MPRDA and NEMA require that the sector meets requirements with respect to environmental management plans, consultation with the landowner or occupier and affected parties, financial provision for land rehabilitation, and proof of technical ability. These requirements carry immense costs, mostly requiring the service of environmental management practitioners (EMP) with high consulting fees, creating a financial barrier most miners cannot overcome.

The application process can also be criticized as difficult and long. It can take more than six months to obtain a mining permit. Additionally, submissions are completed online, disadvantaging those without access to computers or the internet. As the discussion of physical assets in Chapter Four showed, most miners only have access to a cell phone. The processes become arduous and consequently miners prefer to conduct their activities informally and illegally. As indicated earlier, most miners aspire to operate within the confines of the law regulating mining, however, several policies, procedures and respective requirements force miners to operate outside the legal framework. Under the current legal framework, ASGM is not a livelihood for poor, desperate and disadvantaged individuals, but only for those few with entrepreneurial skills and deep pockets to acquire the mining permit.

Several other Specific Environmental Management Acts such as the Water Act, Air Quality Act and Waste Act also require licenses. The ASGM miners interviewed in the study do not

[771] National Environmental Management Act (NEMA).

have the capacity to meet these administrative requirements. Their failure to obtain these licenses adds additional layers of illegality to their activity. The previous claims assert the lack of adequate and appropriate legislation being a challenge that undermines the efforts of the miners to conduct their activities according to the dictates of the specific demands of suitable regulations. Therefore, the need for a distinct and separate legislation would include a specific approach to compliance with these SEMAs.

6.4.4 Size and Extent

Section 27(a) of the MPRDA stipulates that a mining permit may be issued if the mining activity can be conducted "optimally in an area of not more than 5 hectares, and is valid for a period of 2 years, renewable 3 times for periods of less than one year."[772] The duration of the undertaking is limited to a period of not more than 5 years. The area and the total period of mining permits stifles development and general growth in the sector and perpetuates the culture of criminality. Most ASGM miners cannot access financial assistance because most of the funds are tied to the period of the mining project. The miners are unable to sustain long-term market and contracts as they fail to pay back due to little or no future growth prospects. The Small-Scale Mining Directorate admits that "it has limited capacity not only to deal with permitting small-scale mines, but also is under resourced to monitor and evaluate ASGM activities in South Africa as a whole."[773] The Department still seems to lack understanding of the unique needs of ASGM because miners are subjected to prohibitive and treated the same as LSM in terms of environmental management, health and safety, water use and financial provisioning requirements. Thus, a comprehensive approach designed particularly for ASGM would be far more resolute and result oriented to address its real nature.

The Trespassing Act further impedes miners from occupying land without permission from the landowners. The push factors mentioned earlier are assumed to be the driving force towards the occupation of land which abandoned mines like to conduct mining. The areal limitation of the mining permit fails to accommodate that some mining operations, especially in alluvial gold mining need large tracks of land.

6.4.5 Financial Costs

[772] Section 27 of the MPRDA.
[773] DMR 2017.

Due to its informal and mostly illegal status, ASGM is much more precarious than LSM. The reason is because ASGM miners engage in mining operations that pose risks to their health and safety and the general working conditions are risky and dangerous. This is because, the cost of the permit application is the main challenge faced by ASGM. Most miners lack interest in accessing financial resources because they cannot borrow money from financial institutions. The Banks Act requires proper documentation such as an identity document, proof of address, company registration certificate and the tax certificate for any transaction with banks and other financial institutions dealing with lending, investing, or depositing money.

The definition of ASM if considered as a "small business" as per the National Small Business Act, the ASM activity entails that the mining activity should comprise of not more than 50 workers, with an annual turnover of over 7 million Rands and net asset value of not less than 4.5 million Rands. This categorization places ASGM on the same level with other small businesses in other sectors. However, ASGM miners also lack the capacity to be recognized as a small business. As mentioned above, to obtain a mining permit, it is mandatory for the applicants to undertake environmental assessments and feasibility studies, both of which are costly and unaffordable. Literature on ASGM has classified the sector as poverty driven. Miners under study showed clear signs that they were driven by poverty to take part in illegal mining to earn a living. As mentioned before, since the subjects of the study are mostly illegal or undocumented immigrants, the findings and the recommended interventions thereof are applicable to informal ASGM miners. Therefore, ASGM activities can be legalized by ensuring that permits are accessible and affordable to different forms of ASM.

6.4.6 The lack of appropriate technology and skills

Most ASGM undertakings rely on manual labor and basic tools for mining and processing. With a considerable percentage of the miners not having a tertiary education, the lack of skills in the sector is a major concern. Low-level skills lead to poor practices, inefficient mining techniques, poor working conditions, and lack of, compliance with and understanding of government regulation, poor adherence to mine health and safety requirements, and damaging environmental impacts. The level of technology employed in the ASGM sector is characterized as very low and labor intensive such as pick and shovel. Suitable technology enables the miners to improve their productivity and enhance their operations in so far as safety and health is concerned. However, miners have limited capacity to possess and use such technology. Thus, the illegal nature also limits the miner's access to technical support and training and exposes

them to environmentally unfriendly practices that are detrimental to health and safety. Therefore, technical support should be a key policy response to be considered in regulating ASGM.

The need for training and skills was identified as a requirement for the ASGM sector. Most backgrounds of the participants indicated that some specific skills in environmental management, health and safety as well as general processes related to the actual mining were lacking. It is worth to note that the shortage of skills in the mining industry is not unique to the ASGM sector, small-scale miners often lack the primary skills to conduct mining operations.[774] Given all these opportunities, the current state of ASGM fails to grab the opportunity and upgrade their skills because of varied impediments by the law.[775]

6.4.7 Lack of Structures

The lack of relevant structures is a fundamental gap worth of realization to enable the sector to grow. Such structures would incorporate partnerships with local government, NGOs, LSM technical and financial institutions that would ensure the development of the sector. Miners rely mostly on social networks to be able to conduct mining while also operating with no form of cooperation with recognized associations and government institutions. This is based on the perception held by the study that challenges facing the ASGM sector are interrelated and transdisciplinary, and therefore an all-inclusive problem-solving approach is critical to address the needs of the sector.

Access to information is a challenge. ASGM operators do not have a reliable source of information necessary for the sector regarding geology, legal provisions and the sale of minerals. However, the participants go about with their traditional knowledge learnt over time and passed to them by other miners within their community. Poverty is, therefore, perpetuated by the lack of information dissemination to the informal and unregulated miners.

All in all, the needs and problems faced by the ASGM are not being addressed by the law regulating mining. The regulatory system in South Africa has not clearly differentiated different forms of ASM and the interventions meant to regulate the sector has not been effective to deal with the common problems associated with ASGM, capacitate miners in all the spheres

[774] Mutemeri & Petersen (note above 50).
[775] Gyan-Baffour (note 149 above).

of formalization. Furthermore, the AMV's recommendations should be effected and an investment in research on the nature of ASGM in South Africa should be prioritized.

6.5 Reforming ASGM regulation

This section unpacks how the ASGM sector could be better regulated to contribute to livelihoods. Evidence from the fieldwork suggests that many laws are circumvented by the miners and governance tools are important to deal with the tragedy of the commons. Several calls have been made for the formalization of the sector to avert economic and environmental challenges. As a signatory to the African Mining Vision (AMV), South Africa should be guided by its key tenets, that is to transform the ASGM sector through holistic and integrated formalization programs by governments, community-based programs and neo-liberal reforms, that acknowledge that minerals are a finite resource and therefore need to be transformed into more sustainable forms of capital for alternative sustainable livelihoods.[776] There is need for South Africa to domesticate the AMV. To implement and transform the ASGM, it requires baseline data of the sector, a consultative process during the policy and legislative framework development as well as the monitoring and evaluation of the implementation. The process will facilitate the visioning necessary for developing a policy and legislative framework for the ASGM sector to achieve the desired developmental outcomes.

A significant aspect of the development of the ASGM sector is the policy and legislative framework by the governments as it pertains to the whole mining value chain, which should cover exploration, ore extraction, processing, beneficiation, value-addition and marketing. In addition, it would also consider attendant issues such as the environment, occupational health and safety, and socioeconomic impact. Formalization can again be implemented through community mechanisms meant to empower and build capacity through engaging relevant stakeholders and other role players.

6.5.1 Proposed ASGM legislative framework

The MPRDA is the principal legislative instrument for the management of the ASGM sub-sector in South Africa, supported by other laws, such as the National Business Amendment Act, National Environmental Act, Mine Health and Safety Act, Air Pollution Act, Explosives

[776] Mutemeri *et al* (note 765 above).

Act and the Water Act. In reviewing the ASGM policy and legislative framework in South Africa, the main objective will be to establish how the current framework has affected the development of the sector thus far. It is also important to determine whether the legislation has supported the broad aspirations of the White Paper on Mineral and Mining Policy of South Africa (1998) and the specific ASGM policy statements therein contained. Moreover, the legal provisions for ASGM in South African mining legislation can be compared to those in other African countries that are more advanced in the regulation of their ASGM sector. This is a useful exercise considering the current implementation of the Africa Mining Vision (AMV) and the domestication through the Country Mining Vision (CMV) process.[777] The following sub-section details key ASGM provisions contained in the various mining laws in the different countries, including South Africa as well as key motivations from the research findings.

6.5.2 Categories of mining license

African mining laws distinguish between artisanal mining and small-scale mining, hence there is an artisanal mining (AM) license category that is distinct from small-scale mining (SSM). This is true for the DRC and Sierra Leone, and a few other countries such as Liberia, Malawi, Guinea and Mali. Most participants indicated that they preferred a mining permit as it gives permission to explore and mine. It is essential to note that the MPRDA does not explicitly state that the mining permit is for small-scale mining operations as is mostly assumed. Anyone can apply for a mining license, meaning that the MPRDA does not restrict the level of mining to different types of license (in other words, an artisanal miner can apply for a mining permit or even a mining right). The assumption mostly made is that, because the requirements of a mining permit are less onerous and expensive compared to those of a mining right, mining permits are for artisanal and small-scale miners. A legislative framework must distinguish levels of mining operations to assist in the management of hardships that each mining activity encounters. Therefore, there should be a distinct artisanal mining license.

6.5.3 Eligibility restrictions

Literature on ASM has indicated that most African countries reserve the AM license for their citizens. In most of these countries, foreigners are permitted to hold equity in entities that apply for a license, but the level of shareholding is restricted. For example, in Sierra Leone foreigners

[777] UNECA & AU 'Domesticating the African Mining Vision' (A Country Mining Vision Handbook, Addis Ababa 2009).

are not allowed to have equity greater than twenty-five percent. Permitting foreigners to participate in ASGM allows for the necessary investment of capital into the sector which local entrepreneurs may not have. South Africa, however, does not restrict eligibility for mining permits to South African nationals. The majority of miners from the study are undocumented migrants from the neighboring. This finding has been confirmed by other studies indicating that porous borders have facilitated illegal immigration, which leads to illegal operations that inhibits formalization.[778] The researcher submits that restricting some mining activities to locals would allow locals a competitive advantage and would also create opportunities for government to implement ASGM related social programs. Limiting ASGM to citizens at the present moment in South Africa would not be a solution to the current problem bedevilling the sector, but a well-designed structure facilitating groups of miners to form cooperatives with the majority therein being South African citizens.

6.5.4 Designated areas

In certain countries, limitations to artisanal mining come in the form of provisions for designated ASGM areas. In the Democratic Republic of Congo (DRC), artisanal mining is only permitted in areas designated for artisanal mining exploitation. This is true of Mozambique, Tanzania, Mali and Guinea as well. In South Africa, apart from general restrictions on where a mining license can be issued (protected areas, existing mining rights), there are no other restrictions. An entity or individual is free to apply for a license in any area that is 'open'. The field work process exposed that miners were operating on abandoned sites, without the right to land, right to mine and rights to minerals and were often accused of trespassing. As pointed out above, South Africa should consider making provisions for ASGM development in designated zones, particularly in areas with high concentrations of ASGM operations. Designated areas can be advantageous in managing negative ASGM impact, bringing together resources and increasing the efficiency of sector support programs.

6.5.5 Duration of the validity

The terms of ASGM license duration differ from country to country. In the case of both the DRC and Sierra Leone, the artisanal mining license is valid for one year, but can be renewed. In South Africa, a mining permit is valid for two years, with allowance for renewal, making

[778] Sara Busilacchi et al. (note 334 above) 10.

the total five years. It should however be noted that in South Africa a mining right, with the maximum validity of 30 years, would permit ASGM activities. It is important to remember that the mining right is more onerous and stringent compared to mining permits. This is due to its requirements in terms of environmental impact assessments and management plans, social and labor plans and mining work programs, which in most cases are beyond the reach of artisanal and small-scale miners. A management authority could be set up by the government to generally manage the allocated mining sites, in so far as exploration, extraction, processing and marketing of gold is concerned. So, the management authority can get a 30 year right to a designated mining area or land, then a company would be outsourced to upskill and capacitate ASGM miners working on the site.

6.5.6 Areal extent

The areal extent refers to the maximum area for which a license is granted. Again, this differs from country to country. In some countries such as Tanzania, this is not specified in law. In South Africa, the maximum area extent for mining permits is 5 hectares; this has been increased from 1.5 hectares. The 5-hectare area has been criticized because it does not accommodate other mineral commodities, particularly those that are considered to be 'high bulk' minerals such as sandstone, sand and granite.

The depth restrictions are imposed as measures to mitigate against the safety risks of miners operating at this level. These also serve to manage the risk of sterilizing deposits lying deeper than at the permitted depth. Other operating restrictions imposed on ASGM operations include the level of mechanization and the use of chemicals and explosives, particularly in the artisanal mining license category. The South African mining permit does not impose depth restrictions on mining excavation as is the case in Sierra Leone for both the AM and SSM license and for AM permits in the DRC. However, even though the MPRDA does not limit mining permits to surface operations, ASGM in South Africa is characterized by operations that mine on or under the surface and are presumed to work with simple extraction methods. Miners indicated that they would travel more than 2 kilometers deep to access gold ores. This entails that miners are exposed to several and severe occupational risks. Therefore, formalization must state a reasonable level of depth together with the level of health and safety measures to mitigate and prevent mining hazards.

6.5.7 Transferability, leasing or mortgaging

The South African mining permit has matching conditions for ASGM licenses in many other African countries in that it cannot be transferred, leased or mortgaged. These restrictions may affect the feasibility of commercial ventures based on this category of license, making them unsuitable for funding from mainstream financial institutions. On the other hand, the SSM license in some African countries is treated as property that can be transferred, leased or mortgaged, and therefore is more amenable to investment from commercial ventures.

6.5.8 Mineral trading

The majority of African countries have a special license for trading in artisanally produced minerals. This special mineral trading category allows locals to participate as well introduces some level of control by regulatory authorities. Such arrangements have been used to manage the chain of custody for 'conflict minerals' (diamonds, gold, coltan and cassiterite) in countries like the DRC, Sierra Leone and Liberia. In countries where a difference is made between artisanal mining and small-scale mining, the rights of the latter license-holders often include permission to freely trade the mineral product, including for export. In South Africa there is no special license permitting trade in the minerals produced from a mining permit, with the exception of gold and diamonds. These markets are open to everyone, although still dominated by medium to large-scale operations. The level of beneficiation is high in the ASGM sector. A tracking system for all minerals mined and sold by the ASGM can be effected to reduce gold smuggling and other related crimes.

6.5.9 Environmental management

In many of the other African countries where there are separate AM and SSM licenses, the requirements for SSM are very similar to those for LSM, although sometimes less onerous. On the other hand, AM license requirements are very basic, sometimes nothing more than a general undertaking to mine responsibly. In the case of countries like the DRC, responsibility for the environmental management of designated artisanal mining zones lies with the government. The miners' contribution comes from the ten percent of their artisanal mining permit application fee that is allocated by the government for the environmental management of the designated zones. South African legislation has attempted to make the obligations for environmental management less onerous by simplifying the process for developing and implementing

environmental management plans for mining permits. Linked to this is the lodging of a rehabilitation deposit or guarantee with government. While the requirements for a mining permits are considered less onerous, anecdotal evidence suggests that for a lot of the artisanal and small-scale miners wanting to get into the sector, the capacity to meet these requirements is still quite low. This is considered the biggest hurdle in the sector.

6.6 Guidelines to Policy Framework

The present regulatory and policy framework around ASGM in South Africa requires fundamental policy reform. The above proposed ASGM policy framework should be both outcomes-based in nature and should be a product emanating from capacity building mechanism.

6.6.1 Outcomes-based Policy

Essential to note about the outcomes-based policy is that it is result oriented. This means that relevant outcomes in ASGM such as environmental management, sustainable livelihoods, entrepreneurial and skills development, enhanced food security, increased income, appropriate extraction and processing of minerals, protection of children and women as well as good working conditions amongst many others are worth to be realized and championed.

An outcomes-based approach requires a transition from the management of the practice rather than the control of the participants or miners. This radical shift augments the very thought that seeks to shift focus towards regulating the spaces other than individuals which then entails the realization of strengthened and sustainable socio-economic and environmental outcomes. In Tanzania and the DRC, legislative frameworks have focused on allocating and restricting areas for artisanal mining.

6.6.2 Capacity Building (Community-based Approaches)

Until now, top-down approaches have prevailed in ASGM policy formulation, implementation and enforcement. Self-regulation at grassroots level has been reinforced by local organizations and stakeholders because community-based approaches have enabled context-specific as well as bottom-up approaches. Therefore, collective identification of a problem, in this case the

needs of ASGM, collective diagnosis or analysis of the needs and lastly collective solutions are reached by the local key role-players themselves. The researcher submits that such an approach resonates with the extra-legal theory by De-Soto and moreover, creates a sense of ownership and resultantly ensures the sustainable use of natural resources.

An emphasis on inclusivity in policy shift needs to be fortified. This also means that miners' organizations and associations that brings self-governance to practicality in association with legal spaces and demarcated areas of operation. Therefore, this form of arrangement highlights also a system of networks and cooperatives that are capable of achieving capacity building and positively influence miners to responsibly operate.

6.7 Conclusion

In summary, having discussed how ASGM can be conceptualized, its contributions, how the law impedes and how it can be formalized, the provisions for ASGM in South Africa are almost non-existent compared to those in other countries, with some pertinent differences. Even though the sample of respondents of this study may not be demonstrative of the sector, this research takes an example of the most extreme form of "informality/illegality" in ASGM in SA (as demonstrated by the double jeopardy of illegal immigrants plying an illegal trade) to demonstrate challenges at the nexus between ASGM and livelihoods. The sector remains mostly informal, illegal and associated with several negative externalities. Some of the provisions present challenges and barriers which are derailing the development of the sector. Based on the current state of ASGM in South Africa, the sector needs to be considered as a level of mining within a LSM concession or area. Thus, ASGM regulatory authority can be set up to administer skills training, mining techniques, safe mining practices and so forth.

Chapter 7

Recommendations

A good study and a useful one is a study that can be academically acceptable for its scientific soundness and also be relevant to the time and place (in this case post-apartheid South Africa,) and be usable in terms of policy suggestions and recommendations. This chapter, therefore, will proffer recommendations based on chapter 4 (miners narrative), Chapter 5(legal findings) and Chapter 6 (reforming ASGM) to find solutions towards achieving and protecting a sustainable livelihood for ASGM. These include the need to differentiate and define ASM, adopting a bottom-up approach to defining the sector, an appropriate legal framework that supports entrepreneurial skills, constant development, understanding and integration of artisanal mining areas as well as environmental management. Informal and artisanal small-scale mining, if it is a problem, is an issue to be known, understood and legalized in ways that will answer the problem of poverty and also productively and constructively feed into the mainstream economy and polity, in South Africa and elsewhere, this study can state. The following recommendations of the study are based on the findings of the empirical research.

7.1 Artisanal mining definition

Several mining operations in this sector are conducted in different jurisdictions and therefore, it is critical for a specific legal definition to differentiate ASGM from other undertakings. Even though difficult, legitimately recognizing the several diverse categories of ASM that exist is a significant step in determining how to address the undertaking and for adjusting the laws to govern the variety and diverse types of the operations. Eventually, the applicable definition must emanate from the national government and cascades through the provincial, local and regional establishments in ASGM with relevant collaboration and cooperation with globally established systems especially in lawfulness, demographics, scale and nature of mining. Generally, ASM activities exploit marginal deposits, lack capital, labor intensive, have meagre access to financial, marketing and other technical support facilities, low ideals of safety and health and have a substantial negative effect on the surroundings.

The South African MPRDA should differentiate artisanal mining and small-scale mining through the creation of a special mining title perfect for artisanal mining. However, according to S21 of the Democratic Republic of Congo (DRC) Mining Code, ASM is a mining activity conducted by Congolese nationals whereby the use of manual and traditional tools are used to extract and process mineral deposits on a specified area and depth not exceeding of thirty meters.[779] A contrast is made from SSM, which is any undertaking by which a person partakes in a small and permanent mining operation, requiring a minimum of permanent construction of infrastructure using semi-industrial or industrial methods.

Currently, the supervision of most ASGM undertakings is practically impossible due to its illegal nature. Miners are obliged to conduct EIAs, often incongruent with the nature and characterization of their work and lack the capacity to perform environmental plans and guarantees for rehabilitation. In essence, like in most less-economically developed countries where ASGM generally is conducted, South Africa's capacity to provide sufficient support to evaluate impacts or to enforce acquiescence, particularly at the grassroots level is generally lacking.

The researcher suggests that the definition of artisanal mining might entail any person or group of persons of nationality authorized to carry mining activities in a designated ASM area using basic tools, low levels of capital and operating within the maximum depth of no more than 30 meters. Moreover, the capitalization threshold must be capped to prevent the risk of small-scale miners operating through an artisanal mining permit to boost development of artisanal mining into small scale mining.

7.2 Management Authority

Since most areas of interest for ASGM are already abandoned or licensed to larger mining companies for exploration, a management authority could be a panacea to effectively deal with the general and specific administration of artisanal miners. As an alternative, considering ASGM miners as invaders, the DMR and the mining companies need to be encouraged to enter into agreements with artisanal miners. Therefore, this requires an appropriate legal framework to facilitate mining arrangements, such as tribute and contract mining based on incentives for

[779] Democratic Republic of the Congo Mining Code of 2002.

the license holder, as in Tanzania. The ASGM operations can be governed by clear rules, even where ASGM develops in alleged total informality. The ASGM sector in its interior does not "need" laws and regulations to develop; miners have and strictly adhere to their own customary rules. Most ASGM communities require that ASGM be integrated into the official legal system and the formal economy. The closer the formal legal system of the management authority amasses the pre-existing customary legal system, the more likely is compliance through self-regulation.

South Africa could consider a practical and safe transition to a management authority by affording informal miners to organize into cooperatives. The DMR can then facilitate training and allocate an engineer and an occupational and health officer to each site. There is also a need for a mineral trading agency to facilitate gold trade on market rate prices.

7.3 Reserved areas

The government can allocate zones or sites deliberately for ASGM. This will require state support in the form of geological surveys to ascertain and designate areas viable for profitable ASGM mining operations in each local municipality. This legislative measure can be a panacea to the tragedy of commons and domestic conflicts between miners. The opening up of reserved areas can offer both miners and regulators a stable foundation towards livelihood and environmental planning respectively.

7.4 Environmental Permissions in ASGM

Environmental permits for ASGM ought to be developed on already established environmental laws to prevent land degradation, water and land pollution. This environmental license needs to be adjusted to the distinct conditions of ASGM. The MPRDA dictates that a permit be issued if the prospective candidate who has been issued an environmental authorization.[780] Environmental impact assessments for ASGM and particular strategies in dealing with the adverse effects of the sector should be a prerequisite for the entire classifications of ASGM. The local authorities should be tasked to develop simple guidelines for the environmental

[780] S27(6) of the MPRDA 49 of 2008 The Minister must issue a mining permit if —(a) the requirements contemplated in subsection (1) are satisfied; and
(b) the environmental authorization is issued.

impacts assessments, management plans and rehabilitation guarantees for ASGM individual miners based on the extent of the undertaking because the current regime lacks practicality and efficiency. The government should avoid encumbering the miners with compliance costs, which can fuel illegal mining. A group environmental license together with a prospectus indicating how they will rehabilitate the land can be issued to an authorized or restricted area of not more than 5 hectares.

7.5 Decentralization of institutional support and national government structures

The nearer the management and the administrative systems of ASGM to the miners, the easier the administrators and regulators quickly assist the miners and deal with obstacles to more responsible mining. Decentralization of ASGM administration champions the involvement of small governments and disables bureaucratic and top down formalization processes. There is further efficiency in dealing with curbing of mercury use, protection of children, women empowerment and gender equality. Therefore, the DMR, through the Small-Scale Mining Directorate should increase its representation from a regional to local, municipal or grassroots level.

7.6 Institutional and administrative capacity

The study findings indicate that there is an absence of established organizations and governmental systems, and capacity to execute the mining regulation and political will to decriminalize ASGM. Thus, the researcher submits that specific state of affairs and circumstances surrounding the sector, such as the profile, particular characterizations, requirements, and restrictions of miners, as well as the institutional and economic means required to enforce legislative processes should be considered. The study has argued that formalization is a key strategy and an essential precondition for managing ASGM undertakings, enhancing the livelihood sustainability of operations, generating benefits for people, and minimizing as well as dealing with negative impacts.

7.7 General Conclusion

To conclude this study, the research found that there is a relationship between ASGM and sustainable livelihoods. The mediating roles of the law on access, usage and control of the

livelihood assets were confirmed to be impeding the sector. The findings contribute meaningfully to the existing literature by providing insights into the implications of enhancing empowerment programs and dealing with deprivation associated with the sector. In practice, the study suggests possible interventions on how the sector can be reformed. Building formalization framework should take on board diverse needs, profiles of the ASGM community to facilitate or inform an appropriate and sufficient ASGM legal framework. A failed top-down enforcement should be replaced by a community-based management system to enforce mineral resource management. Furthermore, locally responsive and accountable state institutions that support ASGM have been witnessed challenges within the sector as they lack capacity in locally favorable, constructive and sustainable mining practices. However, the vision for ASGM in South Africa seeks to integrate the sector into the greater mining community and to become streamlined into the mainstream economy. Therefore, the South African government has taken active empowerment programs to promote the development of this sector.

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APPENDIXES

Appendix 1: Participants Letter



Title of project: Reframing artisanal and small-scale gold mining as a livelihood strategy and the role of law in constituting livelihood assets.

Greetings.

Re: Purpose of the study

This is an invitation to participate in a study by Maxwell Chuma a PhD student (Faculty of and Commerce, Law and Management) at the University of the Witwatersrand. The purpose of the research is to investigate, artisanal and small-scale gold mining as a livelihood strategy and the role of law in constituting livelihood assets.

As part of this project I would like to invite you to take part in an in a two hour face to face written and audio recorded interview by the researcher. With your permission, I would also like to record the interview using a digital device. The interview will explore the different types of information on how ASGM has actually contributed to livelihoods and how the law currently facilitates or impedes ASGM as a livelihood strategy. You will also take part in a mapping exercise which involves referring the researcher to other miners who can be of help to the study. The interview will be conducted at a location and with language convenient to you.

You will not receive any direct benefits from participating in this study, and there are no disadvantages or penalties for not participating. You may withdraw at any time or not answer any question if you do not want to. There are no penalties for withdrawing from this study.

The interview will be confidential and anonymous as I will not be asking for your name or any identifying information, and the information you give to me will be held securely and not disclosed to anyone else. However, the Researcher cannot guarantee complete confidentially because of legal obligations that may arise. The Department of Mineral Resources and other stakeholders including the municipality and the local police are aware of this research. I will be using a pseudonym to represent your participation, in my final research report. If you experience any distress or discomfort, we will stop the interview or resume another time.

If you have any questions afterwards about this research, feel free to contact me on the details listed below. This study will be written up as a research report which will be available online through the university library website. If you wish to receive a summary of this report, I will be happy to send it to you upon request. If you have any queries, concerns or complaints regarding the ethical procedures of this study, you are welcome to contact the University Human Research Ethics Committee (non-medical), telephone + 27(0)11 717 1408, email hrec-medical.researchoffice@wits.ac.za/ Shaun.Schoeman@wits.ac.za

Yours Sincerely

Student Name: Maxwell Chuma {email: maxwellchuma@gmail.com} Phone No. 0721538829

Supervisor's Name: Tracy-lynn Field

email:Tracy-lynnField@wits.ac.za}Phone No.0827771713

Appendix 2: Consent Form

Informed Consent Form

Title of project: Reframing artisanal and small-scale gold mining as a livelihood strategy and the role of law in constituting livelihood assets.

Name of Researcher: Maxwell Chuma

I agree to participate in this research project. The research has been explained to me and I understand what my participation will involve. I, the undersigned, confirm that (please tick as appropriate):

1.	I have read and understood the information about the research as given	Yes	No
2.	I have been given the opportunity to ask questions about the research and my participation.	Yes	No
3	I agree that my participation will remain anonymous	Yes	No
4.	I agree that the interview may be audio recorded	Yes	No
5.	I understand I can withdraw at any time without giving reasons and that I will not be penalised for withdrawing nor will I be questioned on why I have withdrawn.	Yes	No
6.	The procedures regarding confidentiality have been clearly explained (e.g. use of names, pseudonyms, anonymisation of data, etc.) to me.	Yes	No
7	I agree that the researcher may take photos of me (but not my face)	Yes	No
8.	The use of the data in research, publications, sharing and archiving has been explained to me.	Yes	No

9.	I agree that the information I provide may be used anonymously by other researchers following this study		
10	I understand that other researchers will have access to this data only if they agree to preserve the confidentiality of the data and if they agree to the terms I have specified in this form.	Yes	No
11	I, along with the Researcher, agree to sign and date this informed consent form.	Yes	No

I certify that the nature and purpose, the potential benefits and possible risks associated with participating in this research have been explained to the volunteer.

Participant:

Name of Participant

Signature

Date

Appendix 3: Research Instrument



Semi-Structured Interview Schedule for Artisanal Gold Miners

Questions Directed to 10 Household Gold Miners Respondents

SECTION A: Demographic Data

A1	Ward					
A2	Location					
A3	Gender	Male			Female	
A4	Age	18 -20 years years	20-30 years	31-40 years years	41-50 years years	Above 50 years
A5	Marital Status	Single	Married	Divorced	Window	Widower
A6	Size of household					
A7	Education	Never went to school	Primary	Secondary	Certificate /Diploma	Degree

A8	Language	isiZulu	Sesotho	Other		

Section B: Contribution of Artisanal Mining to Livelihoods

This section focus on establishing how long they been ASGM miners and how they conceptualize their activity.

No	Questions Directed to Miners	Response
1.	Are you a gold miner? How do you go about your work? What are you really doing in ASGM activities?	
2.	For how long have you been engaged in ASGM? For how long do you think you will still be doing this kind of work? Do you regard it as a way to make a living?	
3.	Why do you do it? For what reasons did you join the ASGM activity and why do you stay involved? What are you hoping to achieve?	

4.	Is ASGM your main source of income? What other sources of livelihood do you depend on?	
5.	Do you think ASGM has benefited your household? Has your involvement in the activity made life less stressful, reduce your risk, or feel more resilient and protected?	

Section C: Assets used in ASGM

This section aims to explicate the assets ASGM miners use in the course of conducting their

Livelihoods.

No	Questions Directed to Miners	Response
1.	What do you need to carry out your work of ASGM?	
2.	On which/whose land do you carry out ASGM?	
3.	Where do you find the gold?	
4.	Do you need water to carry out ASGM? Where do you find this?	
5.	What other natural resources do you need to carry out ASGM?	
6.	Do you use your own labour to carry out ASGM? How many hours do you work a day? Do you employ any other people to carry out ASGM? Are you employed by someone to carry out ASGM?	
7.	What do you need to make yourself safe while carrying out ASGM? What do you use to protect yourself? Do you need anything to protect anyone else?	
8.	What tools do you use to carry out ASGM? Do you need any chemicals to do your work? What transport do you use to carry mined material?	
9.	Are you a member of a group which enables to pursue and secure your livelihoods? What facilitate to having a strong relationship?	

10.	Where do you sell your gold? What is the maximum amount of money you make per day? Is it sufficient to meet family needs?	
11.	Do you intend to save or invest on income generating activities any portion of your earning? What are the income generating activities that you intend to invest or that you are investing in?	
12.	How does the local economy react in response to ASGM activities that is local purchasing power and increase in demand of locally produced goods and services which includes tools, food, housing and infrastructure?	
13.	What are the main financial problems in creating sustainable livelihoods within the ASGM mining?	

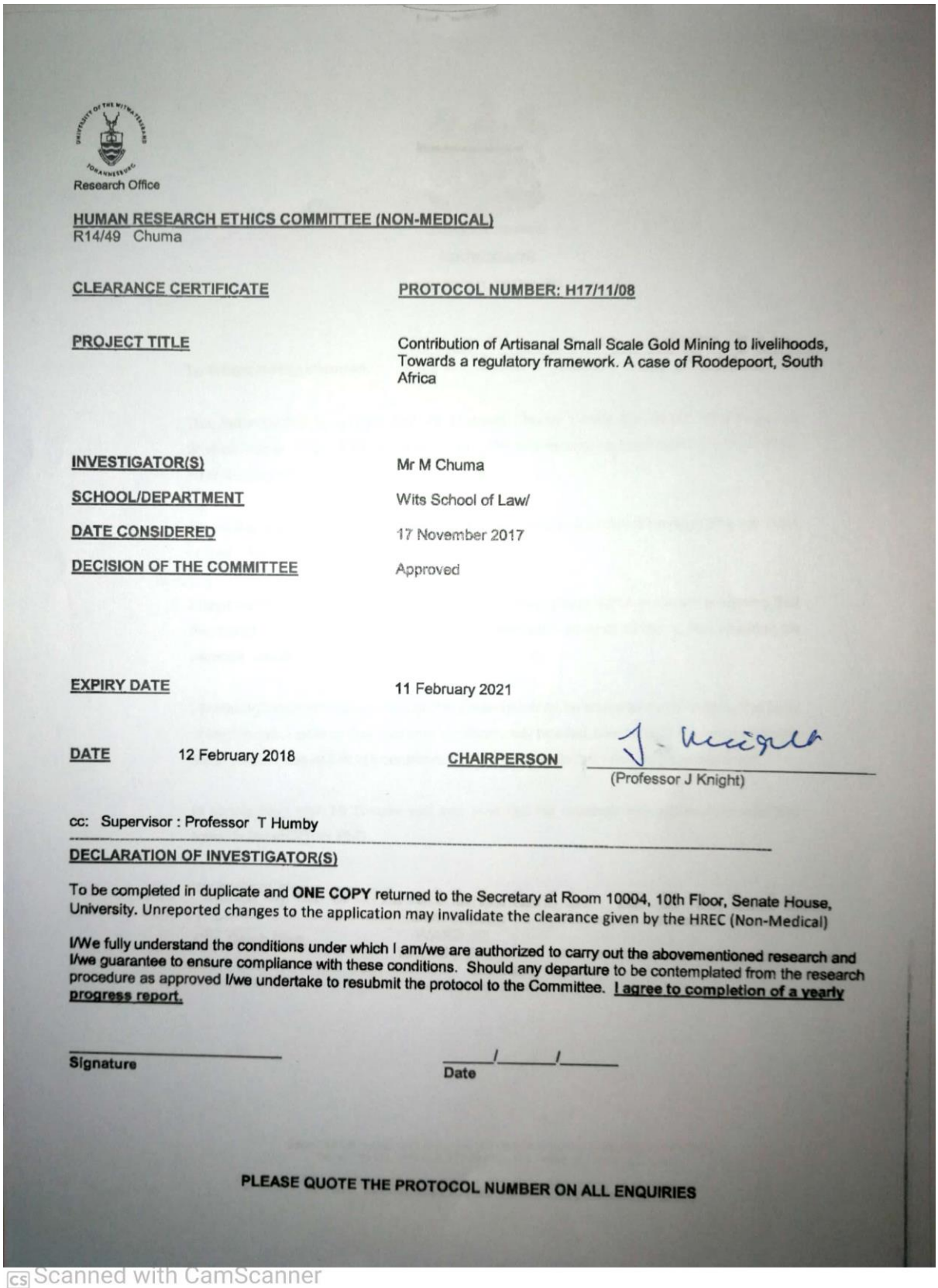
Section D: Assets and the Law

This section aims to elucidate the informal rules that miners may have developed themselves to regulate access to particular assets, along with their experience of the formal rules.

No	Questions Directed to Miners	Response
1.	What rules govern your work? (Here the researcher is aiming to elicit the informal rules that they may have developed to deal with certain assets – for example, that particular miners have their own areas to work) Who enforces these rules?	
2.	Do you think your work is illegal? Why is it illegal?	
3.	Do you think you need a permit or a right to carry out any part of your work?	
4.	Have you ever been arrested? What was the reason for your arrest? By whom where you arrested (SAPS or private security forces)?	
5.	In your view, do you think the artisanal miners' social networks with the elites in the political and security spheres have enabled some of them to survive the police raids?	
6.	How do you get access into the mine and how do you adapt and cope during your operations?	

7.	How does social interconnection and inclusion within a group of artisanal miners enable miners to assist each with resources required for extracting, transporting and marketing of gold?	
8.	Do you think artisanal miners have invested their financial resources in the community?	
9.	What types of belongings/properties have been acquired by practicing artisanal mining?	
10.	Do you think a specific artisanal mining policy may help the artisanal miners to carry out their activities without fear of being arrested? How so?	
11.	Do you think a specific artisanal mining policy may help the government to monitor and control the activities of artisanal mining sector?	

Appendix 4: Ethics Clearance Certificate



Research Office

HUMAN RESEARCH ETHICS COMMITTEE (NON-MEDICAL)
R14/49 Chuma

CLEARANCE CERTIFICATE	**PROTOCOL NUMBER: H17/11/08**
PROJECT TITLE	Contribution of Artisanal Small Scale Gold Mining to livelihoods, Towards a regulatory framework. A case of Roodepoort, South Africa
INVESTIGATOR(S)	Mr M Chuma
SCHOOL/DEPARTMENT	Wits School of Law/
DATE CONSIDERED	17 November 2017
DECISION OF THE COMMITTEE	Approved
EXPIRY DATE	11 February 2021

DATE 12 February 2018 **CHAIRPERSON** _____ (Professor J Knight)

cc: Supervisor : Professor T Humby

DECLARATION OF INVESTIGATOR(S)

To be completed in duplicate and **ONE COPY** returned to the Secretary at Room 10004, 10th Floor, Senate House, University. Unreported changes to the application may invalidate the clearance given by the HREC (Non-Medical)

I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee. **I agree to completion of a yearly progress report.**

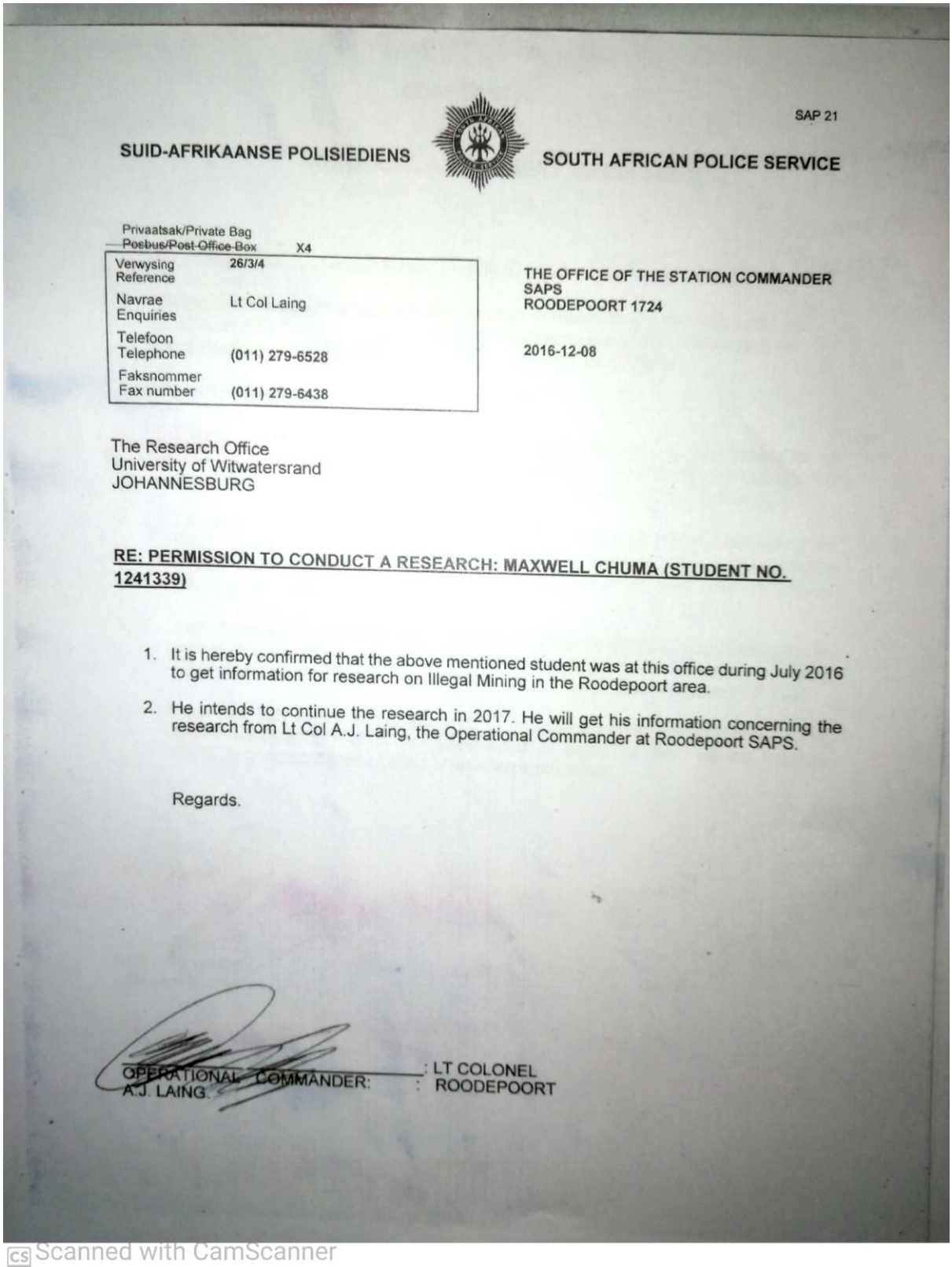
_____ **Signature**

_____/_____/_____ **Date**

PLEASE QUOTE THE PROTOCOL NUMBER ON ALL ENQUIRIES

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Appendix 5: Police Clearance



SAP 21

SUID-AFRIKAANSE POLISIEDIENS

SOUTH AFRICAN POLICE SERVICE

Privaatsak/Private Bag
~~Posbus/Post Office Box~~ X4

Verwysing Reference	26/3/4
Navrae Enquiries	Lt Col Laing
Telefoon Telephone	(011) 279-6528
Faksnommer Fax number	(011) 279-6438

THE OFFICE OF THE STATION COMMANDER
SAPS
ROODEPOORT 1724

2016-12-08

The Research Office
University of Witwatersrand
JOHANNESBURG

RE: PERMISSION TO CONDUCT A RESEARCH: MAXWELL CHUMA (STUDENT NO. 1241339)

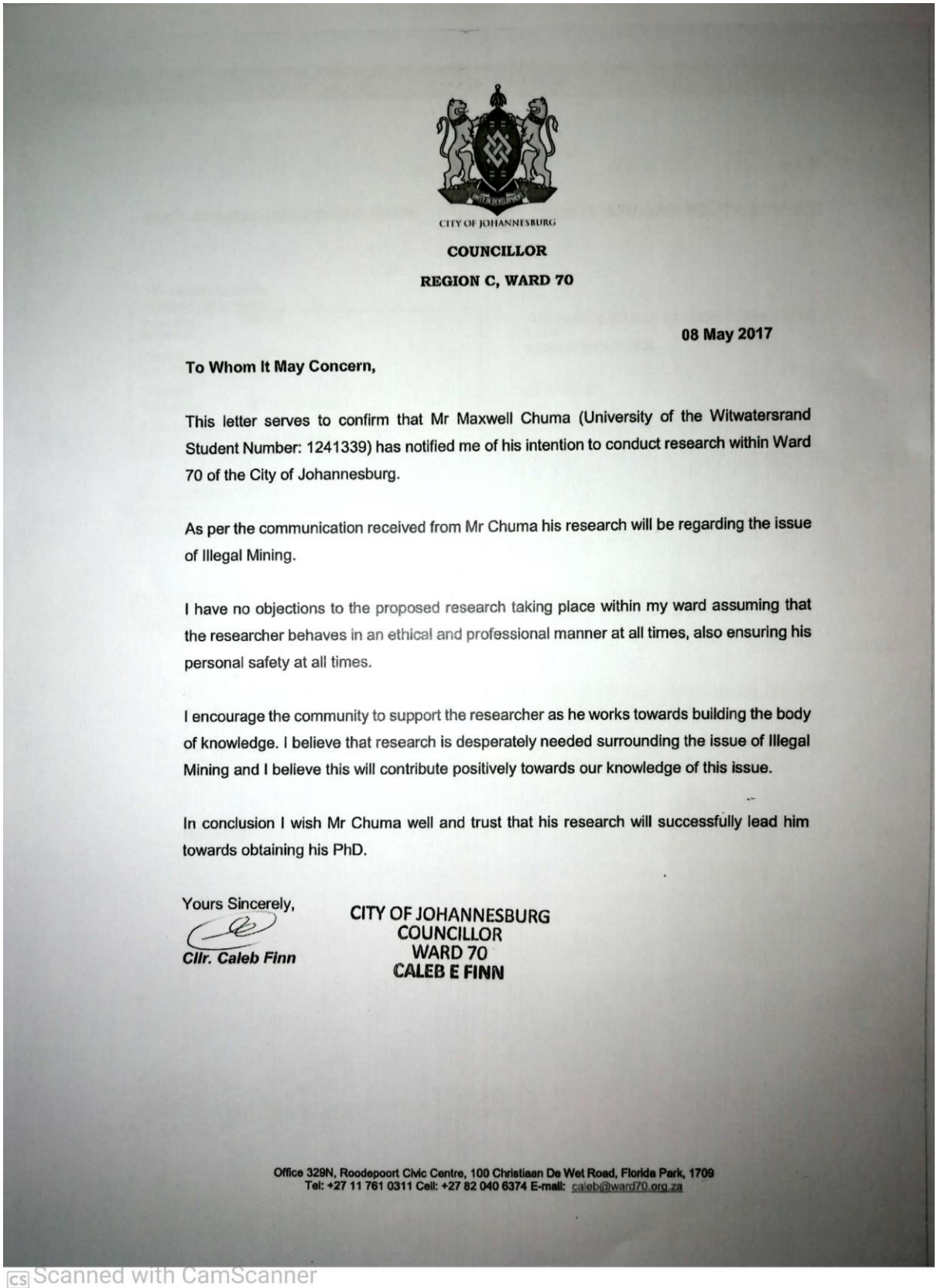
1. It is hereby confirmed that the above mentioned student was at this office during July 2016 to get information for research on Illegal Mining in the Roodepoort area.
2. He intends to continue the research in 2017. He will get his information concerning the research from Lt Col A.J. Laing, the Operational Commander at Roodepoort SAPS.

Regards.

OPERATIONAL COMMANDER: : LT COLONEL
A.J. LAING : ROODEPOORT

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Appendix 6: Letter of Permission (Local Councillor)



CITY OF JOHANNESBURG

COUNCILLOR

REGION C, WARD 70

08 May 2017

To Whom It May Concern,

This letter serves to confirm that Mr Maxwell Chuma (University of the Witwatersrand Student Number: 1241339) has notified me of his intention to conduct research within Ward 70 of the City of Johannesburg.

As per the communication received from Mr Chuma his research will be regarding the issue of Illegal Mining.

I have no objections to the proposed research taking place within my ward assuming that the researcher behaves in an ethical and professional manner at all times, also ensuring his personal safety at all times.

I encourage the community to support the researcher as he works towards building the body of knowledge. I believe that research is desperately needed surrounding the issue of Illegal Mining and I believe this will contribute positively towards our knowledge of this issue.

In conclusion I wish Mr Chuma well and trust that his research will successfully lead him towards obtaining his PhD.

Yours Sincerely,

Cllr. Caleb Finn

CITY OF JOHANNESBURG
COUNCILLOR
WARD 70
CALEB E FINN

Office 329N, Roodepoort Civic Centre, 100 Christiaan De Wet Road, Florida Park, 1709
Tel: +27 11 761 0311 Cell: +27 82 040 6374 E-mail: caleb@ward70.org.za

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Appendix 7: Letter of Permission (Bench Marks Foundation)



Bench Marks Foundation

P.O. BOX 62538

Marshalltown,

2107

11th Floor Khotso House

62 Marshall Street

Marshalltown

To whom it may concern

I, David van Wyk, Lead Researcher at the Bench Marks Foundation, agreed to assist Mr Maxwell Maxwell Chuma in his research (University of the Witwatersrand Student Number: PhD Student 1241339), by consenting to be interviewed by him about Artisanal and Small Scale Mining in South Africa and allowing him to accompany the Bench Marks research team on filed work visits should be wish to do so.

Yours sincerely



David van Wyk

(Cell no: 0826525061, e-mail: d.vanwyk58@gmail.com).

Appendix 8: Letter of Permission (Chamber of Mines)

8 May 2017

To Whom It May Concern

Re: Letter of Permission

This letter serves to confirm that Maxwell Chuma, a student at the University of the Witwatersrand, Johannesburg, has been granted permission to engage me, Dr Sizwe Phakathi, Head of Safety and Sustainable Development, at the Chamber of Mines of South Africa, as a key informant.

Kind regards,

Dr Sizwe Phakathi (PhD Oxford)

Head: Safety and Sustainable Development

Chamber of Mines

sphakathi@chamberofmines.org.za / 011 498 7473