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Analysis for stakeholders on formalization in the artisanal and small-scale gold mining sector based on experiences in Latin America, Africa, and Asia

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LIST OF ACRONYMS AND ABBREVIATIONS

ADB	African Development Bank
ARM	Alliance for Responsible Mining
ASGM	Artisanal and Small-scale Gold Mining
ASM	Artisanal and Small-scale Mining
BGR	German Federal Institute for Geosciences and Natural Resources
CAC	Command and Control Measures
CASM	Communities and Small-scale Mining
CETEM	Brazil's Centre of Mineral Technology
Comandita company	Company with two kinds of stakeholders: ones with all rights and obligations (those with capital who work and participate in the management of the company) and others (those with only capital) with limited responsibility.
Command and control measures or approach (CAC)	Under the command-and-control approach political authorities enact laws to bring about certain behaviours and use enforcement machinery to assure compliance.
CSR	Corporate Social Responsibility
CTC	Certified Trading Chains
DFID	United Kingdom Department for International Development
EIA	Environmental Impact Assessment
EITI	Extractive Industries Transparency Initiative
EU	European Union
Fairtrade and Fairmined standards	Standards developed to certify gold produced by Artisanal and Small-scale Mining under Fairtrade and Fairmined trademarks. The owner of the standards is ARM.
FLO	Fairtrade Labelling Organization or Fairtrade International
GAMA	Gestión Ambiental en la Minería Artesanal Project
Garimpeiro	Name for artisanal small-scale miner in Brazil
GDP	Gross Domestic Product
GEUS	Geological Survey of Denmark and Greenland
GTZ (now GIZ)	German Society for International cooperation
ICMI	International Cyanide Management Institute
ILO	International Labour Organization
INC	International Negotiating Committee
IRMA	Initiative for Responsible Mining Assurance
ISEAL	Global association for social and environmental standards. Working with established and emerging voluntary standard systems ISEAL develops guidance and helps strengthen the effectiveness and impact of these standards. (Also known as ISEAL Alliance.)

ITDG	Intermediate Technology Development Group
KCS	Kimberly Certification Scheme
KP	Kimberley Process
LDC	Less-economically Developed Countries
LSM	Large Scale Mining
MMSD	Mining and Minerals for Sustainable Development Project
MRPAM	Mineral and Petroleum Resource Agency of Mongolia
MRA	Mineral Resources Authority of Papua New Guinea
MSDP	Mining Sector Diversification Programme - Zambia
MUZ	Mineworkers' Union of Zambia
NDF	Nordic Development Fund
NGO	Non-governmental Organization
NSGRP	Tanzania's National Strategy for Growth and the Reduction of Poverty
Oro Verde	Trade mark and program for "Green Gold" certification scheme in Chocó region in Colombia
OGMR	Rwanda Geology and Mines Authority
OIT	Spanish initials for International Labour Organization
RJC	Responsible Jewellery Council
SAM	Sustainable Artisanal Mining Project
SDC	Swiss Agency for Development and Cooperation
SEC	Securities and Exchange Commission
SMC	Shamva Mining Centre in Zimbabwe
SMMRP	Sustainable Management of Mineral Resources Project
SSMAZ	Small-Scale Miners' Association of Zimbabwe
SSMTC	Small-Scale Mining Training Centre in Papua New Guinea
UK	United Kingdom
UN	United Nations
UNEP	United Nations Environment Programme
UNIDO	United Nations Industrial Development Organization
USAGAL	In Portuguese: União dos Sindicatos e Associações dos Garimpeiros da Amazônia Legal. The English translation is: the Amazonian Miners' Union.
USAID	United States Agency for International Development
WB	World Bank
WGC	World Gold Council
WHO	World Health Organization
WTO	World Trade Organization

INTRODUCTION

This document seeks to generate awareness and provide guidelines to policy makers and other interested stakeholders in the formalization of this sub-sector of the mining economy.

The International Labour Organization (ILO) estimated in 1999 that ASM employed 13 million peopleⁱ worldwide, making an important contribution to poverty alleviation in rural areas. Despite this positive contribution, the sector often brings a series of environmental and social problems to the areas in which it occurs.

The case studies developed for this reportⁱⁱ illustrate that ASGM can transform itself quickly when the correct regulatory, economic, and other conditions are put in place. The sector has a demonstrated ability to seize opportunities, as shown in the case of Peru, and more recently Mongolia, where legal frameworks were promulgated resulting in a “rush” to obtain new mining licenses,ⁱⁱⁱ or in the case of ethical initiatives in which the uptake by the producer organizations of the fair trade certification scheme has been very high.^{iv}

This report concludes that high levels of ASGM informality are rooted mainly in legal, political, and economic marginalization^v or where legal frameworks and other public policy plans and programs exist but are not designed to address the unique challenges of the sector.

It is clear from previous experience, especially UNIDO’s Global Mercury Project,^{vi} that international cooperation and national support for the sector is desirable and welcome. To be effective, the support must be long-term and must deal with the root causes of problems (such as inadequate public policy and a lack of environmental, technical, and entrepreneurial knowledge) while also addressing health, safety, and environmental concerns. In doing so, it will be possible to create the conditions for ASGM to become a profitable and sustainable mining sector.

Objectives and Methodology

The present report provides an overview of the ASGM sector in the area of formalization by summarizing the debate surrounding it with a focus on public policy. It seeks to identify key strategic lessons and recommendations without claiming to be the final word on the subject. It is an invitation to review the present public policy approach to ASGM and to consider some specific, practical guidelines to encourage stakeholders to take action in promoting realistic and implementable policies.

In the last 20 years, an impressive body of work has been produced to advance the understanding of the phenomenon of ASGM. The emphasis of that work has been on a) mercury impacts on the environment and communities, and b) socio-economic diagnostics that describe the economic and social relations in mining operations. Comparing this body of work to that regarding ASGM public policy, it is apparent that understanding the elements of an adequate legal framework for ASGM, and what it means to have a long term national policy and programs for formalization, is in the early stages.

Though the shortage of specific public policy literature did pose a limitation for this report, there is a vast literature about “open access” resources in the relevant areas of law and economics that deals with similar problems to those being faced by ASGM.

The recommendations or guidelines are not intended to be exhaustive nor an “instant recipe” for success. They could be expanded and other guidelines can and should be developed in areas such as gender issues and relationships between LSM and ASGM.

The report proposes a conceptualization and approach to ASGM which serve as the foundation for most of the recommendations of this document. The idea is to present manageable suggestions to

public policy makers without underestimating the complexity and the multidimensional nature of ASGM public policy issues.

Important inputs for this analysis came from five case studies from Latin America, Africa, and Asia. The case studies were developed by regional experts based on common terms of reference that sought to identify similarities among countries, as well as unique challenges and opportunities, in a way that would inform appropriate policy responses. The Ecuador study was developed first as an example to guide the others. The Mongolia case study was developed through an in-kind contribution from the Sustainable Artisanal Mining (SAM) project.^{vii}

Another important resource for this report was the extraordinary field experience of the case study authors themselves. Most of them have between ten and twenty years of international experience in dealing with different dimensions of ASGM and have worked closely with miners, listening first hand to the challenges and obstacles that they face.

This document is comprised of six chapters, as follows: A New Understanding and Approach to Public Policy for ASGM; Key Issues and Lessons Learned from Global Efforts Related to Mining Legal Frameworks; Environmental Legal Frameworks to Control the Use of Mercury and Other Major Environmental and Social Impacts; Role of Institutional Aspects in Formalization and Lessons Learned; Role of Economic Instruments in Formalization and Lessons Learned; and Concluding Remarks. References and Explanatory Notes and one Annex complete the document. The Annex compiles the Conclusions and Recommendations that were developed in each section of the report.

I. A NEW UNDERSTANDING AND APPROACH TO PUBLIC POLICY FOR ASGM

In the last 20 years, ASGM has become a growing source of employment in less-economically developed countries (LDC) and developing countries but formalization is still a big challenge and constitutes the root of a substantial number of problems and negative impacts associated with ASGM. The high levels of informality and illegality pose a difficult but necessary question that will be addressed in this section of the report: “Why is it so difficult to formalize the ASGM sector?”

The following section proposes a new public policy approach to ASGM, and suggests that formalization be viewed as a process. The characteristics of this process are defined as fundamental elements for the success of ASGM formalization.

This part of the report provides the key conceptual and theoretical inputs that inform the analysis of the subsequent sections, including the recommendations and considerations.

A. ASGM as a Complex Global Challenge and Opportunity

Artisanal and small-scale gold mining (ASGM), an industry that has been growing globally for the last 20 years, is a reality in most LDC and developing countries with gold mineral potential.

Like other mining activities, ASGM is cyclical, and because of some unique structural and financial characteristics it is acutely sensitive to economic variations. It can appear to be transitory due to its characteristically short-term nature, dependent on workers’ individual savings, but the available evidence strongly suggests that ASGM is not going to diminish as an economic activity in the short term.^{viii}

In fact, ASGM has proved to be a significant contributor to the economic development of these countries, particularly the rural areas:

[ASGM] helps to stem rural-urban migration, maintaining the link between people and the land; it makes a major contribution to foreign exchange earnings; it enables the exploitation of what otherwise might be uneconomic resources; and it has been a precursor to large-scale mining. Moreover, it provides employment to about 13 million people and affects the livelihood of 80-100 million.^{ix}

However, in order to enable key opportunities for positive change and the potential transformation of the ASGM sector, it is also crucial to recognize the negative impacts that ASGM brings to these economies. Mercury contamination is perhaps the most widely known contributing factor to environmental and social problems affecting miners, surrounding communities, and ecosystems.

Figure 1 provides an overview of concentrations of ASGM activity worldwide and the associated mercury consumption. The regions that consume the most mercury from ASGM are Asia and Latin America. Africa is not a big consumer of mercury in its activities.^x

Additionally, ASGM can generate a series of social problems related to exploitation and poor working conditions, in particular among the more vulnerable groups (elderly, women, children). There are ongoing problems with child labour, the general lack of social security, and relationships with organized crime.

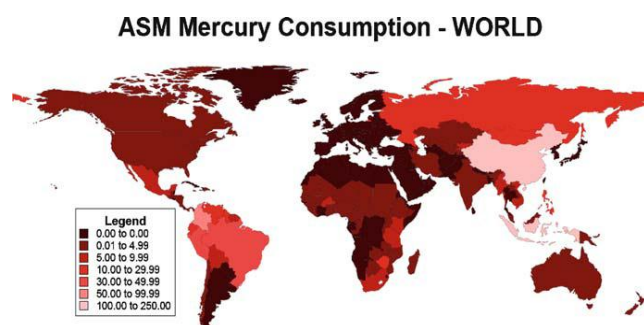


Figure 1. Source: Telmer, Kevin H. and Veiga, Marcello M.

Given these conditions, the equation between negative and positive impacts for ASGM is not easy to calculate. Simultaneously it can be considered a destructive, dangerous, and dirty activity and one that is a highly productive, social activity (job creator) and a true opportunity for significant poverty alleviation.^{xi} Table 1 summarizes the costs and benefits of ASGM.^{xii}

Table 1: Costs and Benefits of ASGM

Costs	Benefits
Geologic and mining costs – exploitation of a non-renewable resource <ul style="list-style-type: none"> • irrational high-grading approach to exploitation • inefficient processing methods • poor transportation 	Geologic and mining benefits <ul style="list-style-type: none"> • the possibility to exploit small deposits • successful exploration with low cost • exploitation of tailings and abandoned mines
Environmental consequences <ul style="list-style-type: none"> • environmental risks, emissions and damage to soil, water (superficial and underground), air, flora and fauna, ecosystems 	
Social costs <ul style="list-style-type: none"> • unsafe and economically unstable work conditions • impacts on the health (diseases, accidents) • precarious life conditions • complex dependent relationships • child labour • violation of the rights of the communities including indigenous communities • change in ethical values and its consequences for the social fabric • absence of reliable social security 	Social benefits <ul style="list-style-type: none"> • work force qualification • sources of income (in cash) • generation of jobs
Macro-economic costs <ul style="list-style-type: none"> • conflicts <ul style="list-style-type: none"> ○ use and quality of water ○ with government (legal conflicts) ○ with large or industrial mining ○ with objective to protect ecosystems (national parks) • smuggling - illegality (of the products and profits) • no payment of taxes • administrative costs to control the sector • social impacts (health, social conflict) • impacts from uncontrolled growth 	Macro-economic benefits <ul style="list-style-type: none"> • mobilization and use of national resources • payment of taxes • positive effect on the balance of payments • buffer for the work force in case of structural programs • work force reserve for the mining industry • contribution to regional economic development <ul style="list-style-type: none"> ○ circulation of currency ○ investments ○ demand for products and services ○ social mobility ○ economic diversification ○ development of the rural areas • development of infrastructure (construction of roads, schools, provision of energy for the communities) • comparative advantage (production with a labour intensive work force in countries with a vast work force) • internal stable supply of the product but dependent on the national and international market • contribution to product diversification and exportation • substitution of imports

A United Nations report from 1994 that evaluated social and environmental impacts and the benefits of the activity concluded that ASM deserves the attention and the support of the international community.^{xiii} In more recent years there is a growing official recognition that ASGM is an activity that can make a significant contribution to poverty alleviation but that it needs support to overcome the problems mentioned above.^{xiv}

It is acknowledged in the literature that there is a direct relationship between negative impacts and legal informality. Full realization of the potential benefits from ASGM is not occurring because of the situation of informality, the resulting illegality of the activity, and associated environmental impacts.^{xv}

B. Why Formalization and Legalization of ASGM is a Difficult Task

Until the 1990s, only a few countries had specific legislation for ASM (e.g., Brazil (1968), Papua New Guinea (1975), Ecuador (1975)). In some countries, these regulatory frameworks were complicated to implement because they followed the requirements of large-scale mining, as was the case for Papua New Guinea and Ecuador. In other countries the legal framework was not well enough developed. In Brazil, for example, ASM legalization was done through registration of individual small-scale miners (*garimpeiros*) without any relationship to the specific attribution of an area. It did not have any impact on forms of associations or business structures, nor did it promote environmental or social protection.

An ILO questionnaire, done as part of 1999 report on 28 ASM countries, concludes that:

The proportion of illegal mines - those operating without the necessary authorization - varied from 5 to 80 per cent (...) In half of the countries, 30 per cent or more of small-scale mines were reported as operating illegally. If these figures can be considered a valid sample, the extent of illegal small-scale mining is very high and so, therefore, are the likely financial losses to the countries and regions most affected.

The association between illegality or informality and ASGM activities is so common that it is considered to be an inherent characteristic of ASGM^{xvi} in some countries.^{xvii} Some advocate that it is better to accept the informality, because legalization creates more problems than solutions.^{xviii} Others see illegality (or informality) as the strength of ASGM and part of its nature and creativity.^{xix}

Underlying these perceptions is the inherent complexity and difficulty of legalizing and formalizing the activity. There is no easy or obvious combination of policy and regulatory mechanisms to create the conditions for a healthy ASM sector. To navigate successfully through this complexity it is important to answer the question, “why is formalization such a difficult task?”

i. A Comparison of ASGM and LSM

The LSM sector is capital and technology intensive and is increasingly a business for relatively few players. ASGM, in contrast, is characterized by being very low capital and low technology intensive with diverse actors dependent on significant human labour inputs – an activity for (almost) everyone.^{xx} Herein lies some of the difficulty in understanding ASGM as a legitimate part of the mining sector. Figure 2 compares the main indicators between the ASM and LSM sectors.

ii. Open Access to Mineral Resources

Part of the difficulty in legalizing and formalizing ASGM is due to the nature of the mineral deposits themselves.^{xxi} The nature of the deposits has important implications in terms of the use and exploitation of the mineral resources:

- open and easy access to anyone interested in extraction
- generation of economic and social returns for low investment cost

- diverse and plentiful interest in the resource that makes it hard to control the exploitation

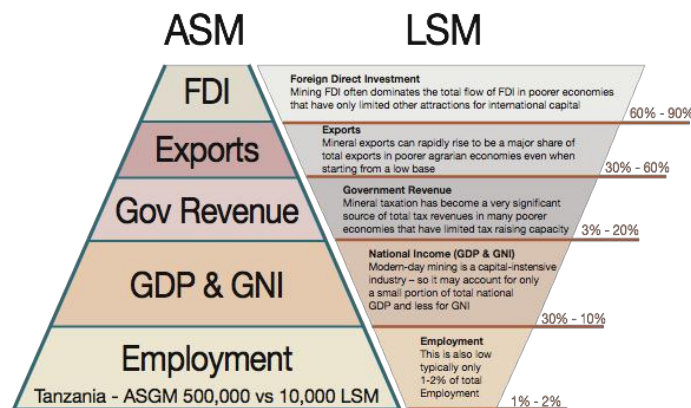


Figure 2. Comparison Between ASM and LSM Sectors

Source: Kevin Telmer, OECD, May 2011^{xxii}

These characteristics are all associated with the fact that the mineral deposits that ASGM works are in an “open access” situation^{xxiii} in which there is no or limited control about *how many* companies or individuals can produce or consume a resource and virtually no restrictions on *how* to produce or consume it. Essentially, there are no property rights associated with the resources in question.^{xxiv} Another industry facing the challenges of open access is ocean fisheries.

Establishing property rights is more difficult for some resources than others because of the physical and chemical properties of the resource. The easily accessible deposits extracted by ASGM are considered to be in a situation of “deep open access” because of the special physical and chemical properties of the deposits and the minerals that ASGM produces.^{xxv}

While all countries have these kinds of deposits, some countries have a combination of geological and environmental conditions that result in mineral concentrations of greater quantity and quality than others. The persistence of Artisanal and Small-scale Mining in the past, present, and future is fundamentally tied to the abundance of these kinds of deposits. In this sense ASGM is a geologic opportunity.^{xxvi}

The debate about the problems and the mechanisms to control these kinds of resources is too lengthy and complex to detail in this document, but the following sentence from Devlin and Grafton (1998) is illustrative of the problem that the policy makers have in their hands, “the majority of national and global environmental problems have their origin in open access”.^{xxvii}

In summary, the main lesson extracted from the literature is that despite the difficulty of establishing property rights for resources in a deep open access situation, the best way to control the use of such resources in a sustainable way is through a set of rights and obligations (not necessarily only private rights but other kinds of rights appropriate to the circumstances) combined with the use of economic and technological instruments, and community management tools.

iii. Approaching the ASGM Sector

ASGM is an economic and mining sector with specific technical, economic, and social characteristics. This concept is the starting point for building a national approach to formalization and legalization of the activity.

No less important is the recognition that the large-scale mining sector is not an exclusive model for mining.^{xxviii} Enabling the diversity of the mining sector to better use all of the geologic potential of

the country and to address the socio-economic situation of LDC and developing countries is an important goal not only for the mining sector but for overcoming one of the greatest problems of our century – the increasing impoverishment of the developing countries.

It is important to note that, as a means of addressing issues of poverty alleviation, the downside to large-scale mining is that it is not a substantial employer because of its focus on capital and technological intensity. The *Golden Opportunity* report noted that: “The formal mining sector employs around 11 million people globally. Of this large-scale mining employment in developing countries totals about two million.”^{xxxix}

The traditional livelihood activities (such as agriculture or forestry) available in rural areas are also not a solution in and of themselves because they are often less attractive in terms of the generation of a sufficient income and the fact that there is a gap between the number of jobs that can be generated and the number of people currently in need of employment.^{xxx}

If ASGM is to be successfully realized as part of a nation’s mining sector, it must be rooted in a geological rationale. Understanding ASGM as the economic manifestation of a geological reality redefines the debate about ASGM from being a social problem to being a mineral opportunity that has the potential to significantly contribute to poverty reduction.

This is not to say that social problems do not play a role in ASGM sector. The current level of social problems which LDC and developing countries are facing does place negative pressures on the ASGM sector which in turn results in a series of negative impacts commonly associated with it. However, they are symptomatic of a combination of social problems and the marginalization of the sector from public policy.

The geological argument combined with this view of the nature of social problems in the sector implies that, if over time ASGM is able to be included as a formal sector and the main social problems related to poverty issues are addressed, ASGM will continue as a segment of the mining sector side by side with other economic alternatives, with fewer of the negative impacts noted in Table 1.

Taking this approach to the development of the sector is important because it demonstrates that the intrinsic difficulty of legalization and formalization does not reside in the nature of the people that perform these activities but rather in the physical and chemical characteristics of the deposits and the socio-economic characteristics of the countries with ASGM, among other factors. These issues can be addressed, transformed and, importantly, can become part of the solution.

In practical terms, this means that the responsibility for the current high levels of illegality is not only due to lack of political will or interest from the producers, but rather that ASGM represents a real challenge that requires creative and flexible approaches to legalization and formalization. Experience suggests that these approaches must integrate command and control measures with economic incentives and institutional and organizational measures to be successful.^{xxxi}

The processes of ASGM legalization and formalization are indeed challenging but they need to be faced because the other alternatives (ignoring, forbidding, waiting for it to disappear, repression) are not effective options, as history has repeatedly shown that they have proved to compound existing problems. In order to create a sector that can contribute more fully to economies and to the sustainable development of the countries, legalization and formalization are both desirable and necessary.

C. Formalization as a Process – Vision and Key Objectives

The terms “legalization” and “formalization” often are treated as synonymous but they refer to distinct concepts. Legalization is just one dimension of the process of formalization, which is a broader concept. Formalization, as a process that brings ASGM into the formal economy, can only be achieved if programs and public policy deal with the different dimensions of ASM activities simultaneously and in an integrated way.

This integrated approach is critical particularly for ASGM because of the difficulty and complexity of this sector and the multidimensional nature of the associated problems. It is a lesson drawn from many ASGM technical and environmental initiatives of the 1980s and 1990s that were synthesized in the ILO report (1999), “The underlying theme of this report is that all issues affecting small-scale mines need to be considered together, or at least linked.” It continues with a specific example, “Merely adding a single piece of equipment (such as a retort or centrifuge) will not bring about the desired improvements in health or safety. In proposing measures to improve them, the fact that the benefits will be tangible, quickly realized and exceed the cost must be guaranteed and demonstrated in the working environment.”^{xxxii}

Very often the approach to formalization does not include the concept of process but rather is a technical legal exercise by specialists or an initiative undertaken by policy makers focused on producing a “product”.

It is better to understand that ASGM formalization is a process and not a singular, discrete action in a particular moment. This approach is critical because it underscores the ideas of continuity, participation of relevant actors, and incremental progress. It follows that this will necessarily be a multidimensional and multi-stakeholder process because of the different elements of formalization and the diverse actors involved in and impacted by the process. See Box 1.

Box 1: ASGM Formalization Process

CHARACTERISTICS OF ASGM FORMALIZATION PROCESS	
Continuity	ASGM is a diverse sector which, in terms of business development, has many participants at the bottom and few at the top. Bringing the bottom segments of ASGM up to the middle and top of the pyramid is a long term process that requires a continuity of policy support that allows for a gradual and incremental process of improvement.
Stability	Stability for the LSM sector is the primary requirement for a successful business and this is also true for ASGM. This does not mean that the policies and framework should not be improved over time but it is important that the long term objectives of such public policy are preserved and that the economic viability of the mining operation is maintained, along with environmental and social sustainability.

Multiple dimensions

Public policy for formalization (including associated plans, programs, etc.) should be multidimensional. Various projects, including MMSD (2002), ILO (1999) and Barreto (2003), have identified, with slight variations, the primary dimensions of ASGM including finance and access to credit, legalization, gender, organizational and institutional, environmental management, technological development and transfer of technology, participatory local management, access to information, work conditions, and health and security.^{xxxiii} Not only do these dimensions need to be integrated at different levels of public policy but there is also a need for coordination and integration among different institutions that work with ASGM.^{xxxiv}

Multiple stakeholders

Several stakeholders, including governments, the ASGM sector (businesspeople and workers) and civil society groups, are all important players. Successful formalization takes into consideration these different interests and creates space for participation of all stakeholders. Mining is at the beginning of a chain of custody and without involvement throughout this chain it is impossible to have a solid formalization process for ASGM. The participation of the interested stakeholders (in particular the miners' organizations) in elaboration, implementation, and evaluation can provide insights to more efficiently resolve complex problems.

PROCESS OF ASGM FORMALIZATION

Use of different public policy approaches and instruments

The complexity of the ASGM sector calls for fresh approaches to formalizing the sector beyond the traditional command and control mechanisms. This means combining command and control mechanisms with economic instruments and community management mechanisms. Understanding how ASGM responds to these approaches in the different dimensions of formalization is also crucial.

Generation of and access to information

Generating information about ASGM and the chain of custody is very important because without proper information it is difficult to evaluate the positive and negative contributions of the sector. Also, information is needed for effective public policy initiatives - generating information from basic data (production, number of operations, number of people, tax contribution, etc.) is the first step of any process of formalization.

Access to information, especially for a socially and economically challenged sector like ASGM, is a priority. Access to not only basic information but also government policies (programs and plans) and legal and regulatory acts is important and needs to consider the cultural background of the intended audience.

Development of an ASGM vision

As with any process, there must be a vision and clear objectives for implementation along with a deliberate strategy and practical mechanisms to achieve them – from public policy development to program delivery.

The vision provides the destination, guarantees continuity, and brings inspiration.

An example of a vision drawing on the approach suggested above could be stated as follows:

ASGM is an economic mining activity that can be legal and profitable for all involved, as well as being an environmentally and socially responsible livelihood. It can contribute, side by side with other economic activities, to the alleviation of poverty and the sustainable development of less economically developed and developing countries.

The exploration of issues in this section begins to explain why ASGM is so difficult to formalize and legalize and also provides some answers at the macro level in terms of how public policy can more successfully approach ASGM.

How this approach specifically translates into an ASGM regulatory framework at the program and initiatives level (e.g., the attribution of mining rights, environmental regulations, taxation, credit mechanisms, and other dimensions) will be analyzed in subsequent sections.

II. KEY ISSUES AND LESSONS LEARNED FROM GLOBAL EFFORTS RELATED TO MINING LEGAL FRAMEWORKS^{xxxv}

Since the 1990s it has been possible to identify a global movement towards systematic regulation of ASGM in Latin America, Africa, and Asia. Nevertheless, it is clear that the development of legal frameworks for ASGM is still in its early stages and there is a lot of space for more comprehensive, integrated, and realistic approaches.

The following section identifies the main opportunities and challenges that ASGM mining regulatory frameworks are now exploring and promoting.

A. Mining Titles and Related Generic Obligations and Rights

A mining title is the first legal requirement for performing any mining activity and without it, in principle, it is not possible to mine legally. The mining title defines the rights and obligations of the holder. The title also ascribes potential market value to the mining operation (depending on the rights and obligations associated with the mining title). For example, a mining title of 25 years duration with the possibility for renewal is of greater value than a title with 5 years and with possibility for renewal (opportunities and the amount of credit that can be obtained with some titles is limited by these conditions).

Overall, the mining title is a necessary, but not a sufficient, condition for undertaking work. The other conditions include environmental authorization, licences, and payment of taxes, fees, and royalties.

In relation to mining titles, the following issues are considered critical:

i. ASGM Definition

There has been a longstanding debate about a definition for ASGM, which was particularly intense in the 1980s.^{xxxvi} The debate did not achieve a universal definition for a number of reasons but possibly the most important ones are that:

- The goal was to have a single universal (absolute) definition. It is probably more realistic to have different definitions to serve different objectives.
- The definitions tend to mix characteristics with symptoms or with implications for the informal situation. It is common to build concepts such as illegality, the use of rudimentary technology, etc., into the definitions

7 considerations for ASGM mining titles

- 1) The objective of an ASGM definition in public policy is to be able to identify and distinguish it from other mining activities.
- 2) Any general definition should proceed to a specific categorization of ASGM activities.
- 3) It is important that the definition does not create any obstacle to the evolution and progress of the activity, which means words like “illegal”, “primitive”, or “rudimentary” should be avoided.
- 4) Different mining titles for different categories of ASGM allows for simplification of the administrative and technical procedures.
- 5) Within each category there should be one mining title for all phases of the mining cycle.
- 6) Commercialization and processing licences should only be required in cases where these are independent businesses from the extraction mining activities.
- 7) Title holders are the ones ultimately responsible for the mining activities in the area. The people (e.g., labourers, operators, manager, etc.) that work in the mining title area should have contractual relationships with the holder of the title.

- There is generally a lack of clarity about the reasons and objectives for adopting a particular definition. A definition that can be included in a mining code needs to be different than a definition that tries to explain or describe ASGM in a particular timeframe.

This inconclusive debate led to the idea that a definition is something that should be avoided or is impossible to achieve. Possibly this is true in terms of arriving at a universal definition. From a public policy perspective, and especially for regulatory purposes, a definition is fundamentally important because without this it is not possible to practically distinguish ASGM from other mining activities. The other objective of having a working definition is to provide the vision for what the sector should be in the long term.

The following definition, developed by the author of this report, attempts to incorporate geological and mining concepts without creating obstacles to the future evolution of ASGM operations in terms of growth, innovation, and efficiency:

Artisanal mining and small-scale mining are those activities that exploit mineral deposits [with the combination of geologic, physical and chemical characteristics] that allow for simplified forms of exploration, extraction, processing, and transportation. It is a form of mining in which the exploration and exploitation phases can occur simultaneously and in which all phases of the mining cycle can involve low capital intensive and high labour intensive technology. ASGM can include men and women working on an individual basis as well as those working in family groups, in partnership, or as members of cooperatives or other types of legal associations and enterprises.

This definition is not meant to be prescriptive, but rather is an illustration of one possible approach and an invitation for further discussion at the national level.

ii. **ASGM Categories and Related Titles**

As mentioned, it is important to distinguish between ASGM and other mining activities. Within ASGM there is an equally important need for categories that allow for different mining licences, which can respond to the diversity of the sector. Table 2 shows the example of Peru.

Table 2: ASGM Categories in Peruvian Law

Category of ASGM Producer	Maximum size of title (hectares)	Installed capacity of production and processing plant (metric tons per day)	Installed capacity of production and processing of Placers (cubic meters per day)	Characteristic of group and means of production
Small Mining Producers	2000	350	3000	- All legal persons
Artisanal Mining Producers	1000	25	200	- Natural person or group of natural persons - Use of manual methods and basic equipment

The literature is unanimous about the need for simplification of the procedures for ASGM,^{xxxvii} but it must be noted that responsible, effective simplification that pays attention to the size of the mining operations and promotes protection of the environment and communities as much as the workers, can only be achieved through diverse ASGM categories. This kind of categorization can help to simplify the administration of titles. In fact, consideration should be given to creating more categories that correspond to different mining titles because it allows for recognition of the true diversity of the sector. Generalization and oversimplification of mining titles can create obstacles in addressing the diverse and unique challenges of different types of ASGM operations.

iii. *Phases of the Mining Cycle and Mining Licences*

Traditionally, the phases of the mining cycle include recognition, exploration, exploitation, beneficiation (or processing), refining (smelting), and commercialization. (See Figures 3 and 4.) Several regulations have different titles for different phases of the mining cycle and have a tendency to replicate the same approach for ASGM. Examples include: Tanzania, which has a primary prospecting licence and primary exploration licence; Ghana, which has a restricted reconnaissance licence, restricted exploration licence, and restricted exploitation licence; and Greenland, which also has two licences – one for exploration and another for exploitation.^{xxxviii}

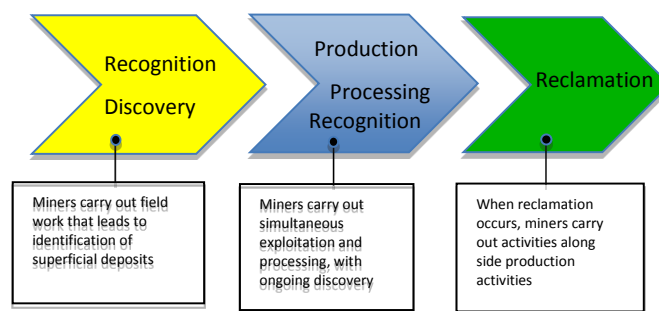


Figure 3: ASM Mining Cycle Diagram^{xxxix}

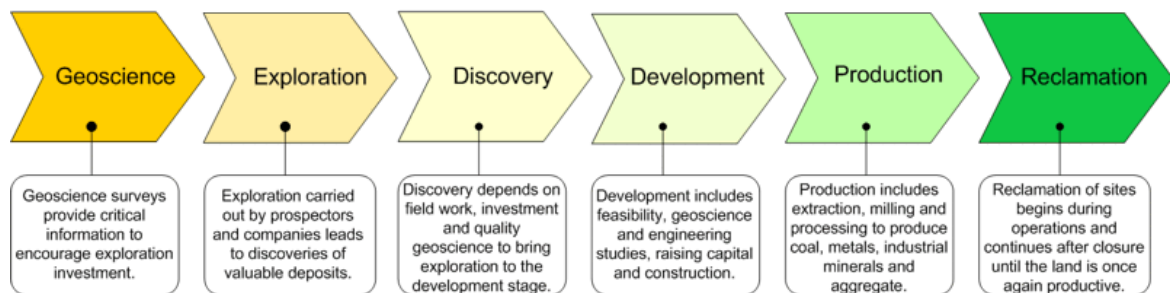


Figure 4: LSM Mining Cycle Diagram^{xl}

Simplification of the legalization of ASGM is a key issue and this is one area where it is possible to simplify without jeopardizing necessary control of the activity. In most ASGM operations the exploration and exploitation phases occur simultaneously with beneficiation/processing. Ecuador is one of the examples where these special characteristics are recognized.

In terms of beneficiation or processing, it is possible and may be desirable that the mining title allows for the execution of processing activities without additional licences except when the processing plant

reaches a specific size or when processing is a business without any mining extraction activities. The same principle of single licences allowing for integrated activities should also apply to commercialization. In this case, the scale of operation is less of a factor, but it is important that commercialization businesses that are not connected to mining operations are required to be licensed so that they are part of the overall system of controls of the sector.

One practice in several jurisdictions is to distinguish between the titleholder and actual mining operation. This means that the activity is legalized through the title but the mining operation occurs without any legal agreement between the mining titleholder and the workers despite the fact that the titleholder has an economic relationship with them. This situation should be avoided as much as possible because it tends to generate exploitation, and even human rights violations, around work conditions. There are ways to regulate title attribution to prevent this kind of situation, specifically:

- Create different categories with corresponding mining titles that allow for diverse sizes of operation (familial, micro, small);
- Require titles to be attached to a legal entity (e.g., solo companies, cooperatives, limited and unlimited responsibility companies, etc.);
- Limit the number of titles (one or maximum two) to one legal person (from very simple to more complex legal persons);
- Connect the titleholder to social, environmental, and technical responsibilities
- Base taxation on the number of hectares;
- Report on activities annually (which can be simple or more comprehensive depending on the size of operation) to allow easier monitoring of activities and the development of relationships with the title holder; and,
- Impose penalties (e.g., title cancellation) for violation.

B. Requirements for the Attribution of Mining Title Areas

The mechanism for designation of mining title areas is an important public policy instrument that, depending on the size of the area and the duration of time allowed, can either enable or impede economically viable and stable ASGM activities. In turn, this viability will affect conditions for bringing families to mining regions and the associated formation of communities.

It is difficult to recommend specific sizes for ASGM, particularly when ASGM categories are generic and when land attribution is related to traditional practices, other government policies, etc. Nonetheless, there are no clear parameters behind the definition of area in current mining frameworks except for the common practice of granting very small portions of land to ASGM when compared with large-scale mining (e.g., LSM areas in Ghana may be up to 105,000 hectares and in Sierra Leone they are 1 million hectares in the reconnaissance phase and 25,000 hectares in the exploration phase) (see Table 3).

In general, placer deposits tend to need more area because the exploitation activities are often horizontally extended and the average life of a placer deposit is around 5 to 7 years (depending on the technology used and the size and content of gold deposit).

Primary ASGM deposits typically do not need as much land area but this is not always the case because the superficial veins sometimes occur along horizontal extensions and ASGM operations rarely are more than 20-30 meters deep.^{xli} This focus on superficial deposits can, of course, be changed with the development of small-scale mining operations with the introduction of technology and methods that allow for safer and deeper extraction.

6 considerations for mining title areas

- 1) The definition of size of mining area should be treated as an instrument of public policy that can have positive or negative economic impacts on the operations, on the stability of the people that work in the operations, and on the social fabric of the local community
- 2) The size of the mining area may be defined based on the categories of the mining titles, type of deposits, data about ASGM operation in the country, and other land use factors
- 3) Opportunity for renewal of the title is very important for mining operations because it allows them to invest and continue work until the deposit is exhausted and for the government in its function of promoting the best practices in extraction of mineral resources
- 4) Reserves or dedicated areas for ASGM in most cases are generally difficult to implement because they can be costly and demanding for governments to enforce
- 5) In cases where this concept is used, incorporating the knowledge of the ASGM sector to help in the demarcation is essential
- 6) This approach may prove effective to implement and enforce in communities that have special territorial rights (e.g., indigenous communities). Participation of the community in the demarcation of the area is essential, as is the concept of exclusivity for ASGM to operate in the area

Taking all these aspects into consideration, the size of the mining area may be defined by different categories of mining title and by the type of deposit, which can provide some flexibility to adapt to the specific conditions of the site. The mining area can also be defined within a range of minimum and maximum area (e.g., Cote d'Ivoire or Sierra Leone, see Table 3).

The duration of the title and the right to renew are also important instruments of public policy. Traditionally, the mining sector has allowed for long periods of tenure as a component of investor security – from “indefinitely”, in the case of Peru (which today is an exception in the mining sector), to 20 to 30 years as the average, with the possibility to renew for an equal period.

In the case of ASGM the tendency is exactly the opposite. The period of tenure ranges from 1 to 5 years, usually with a limit on the number of renewals and requirements for more frequent renewals (which creates costs for operators and regulators). While it is true that ASGM deposits usually have a life span shorter than LSM deposits, the restrictions imposed on ASGM tenure are not based on a specific technical or public policy rationale.

In terms of public policy, the government may prevent ASGM (or any other mining activities) from “sitting” on deposits without exploiting them. The situation could be remedied with simple controls (e.g., requiring annual production reports, or only attributing one title at a time). This situation is in fact less of a problem for ASGM than it is for LSM.

The ability to renew a mining title is also a crucial public policy instrument. It is important for the producers and mining organizations to be able to protect existing investment in the area, as much as it is for the government, in its role as guardian of mining property rights, to ensure that operations are not simply high-grading deposits and are abiding by other (e.g., environmental or social) permit requirements. Table 3 shows there are many restrictions and much uncertainty regarding this issue. It is recommended that the renewal of the title be allowed without any artificial time restriction until the “exhaustion” of the mineral deposit (which is always an economic and technical decision).

Table 3: Basic Conditions of Mining Titles by Country

Country	Category of title	Dimension of title area (hectares, unless otherwise noted)	Duration (years)	Renewal
Brazil	Permission for extraction Garimpeira (exploration can be requested)	50 Cooperative can have bigger area	5	Every 5 years
Cote d'Ivoire	Small scale mining authorization	25 - 100	2	2 year periods
	Semi-industrialized mining authorization			
Ecuador	Artisanal permits	Unclear	10	10 year period
	Small scale mining concession	300	25	10 or 25 years depending on the criteria of the authority
	Small scale mining concession with bid process	300 to 5,000	25	10 or 25 years depending on the criteria of the authority
Ghana	ASM: Person, group of persons, Cooperative society/company	In accordance with blocks prescribed	5	No information
Mongolia	Licence (partnership)	5 - 50	1	1 year indefinitely
Peru	Small concession	2,000		Each year indefinitely
	Artisanal concession	1,000		Each year indefinitely
Philippines	Small scale mining permit and contract	20	2	For the same period
	Artisanal mining (Gold panning and Sluicing permits)	0.2	6 months	For the same period
Sierra Leone	Artisanal Licence	0.5	1	3 additional periods not to exceed 1 year at a time
	Small scale mining licence	1 - 100	3	Every 3 years
Tanzania	Primary exploration	10	1	1 year periods
	Primary exploitation	10	5	5 year period
Uganda	Class I precious metals in hard rock	500m x 300m	2	2 year period
	Class IV precious metals in alluvial deposits	16	2	2 year period
Zimbabwe	Reconnaissance licence	-	-	-
	Prospecting licence	-	-	-
	Mining licence	200m x 500m	-	-
	Artisanal licence	Depends on the local authority		

Sources: Various – see references ^{xlii}

Commonly, ASGM regulatory frameworks use the concept of reserves – special or dedicated mining areas (e.g., Tanzania, Mongolia, Brazil, Colombia, Ghana, and the Philippines). As much as this appears to be a good instrument because it allows more effective control and avoids the potential for competition for the resource with LSM or other economic sectors, experience has shown that this approach has not been very successful, for the following reasons:

- Demarcation of these areas should be based on geological data and studies. They are often not available at the appropriate level of detail in developing countries and are unlikely to become available in the future (as they are very expensive and there are other priorities for public investment);
- When the demarcation is not based on geological data areas with no or poor mineral potential can be dedicated and as a result the government loses credibility and compliance;
- Dedicated areas do succeed in some cases, when the demarcation is established after the ASGM activities are active in the area. However, in this situation the objective of the dedicated area is redundant;
- Very often the dedicated areas become a way to control and limit ASGM activities. Meanwhile, maintaining the “exclusive” attribution for ASGM is difficult, especially when the area has significant mineral potential (e.g., Colombia).

This last case deserves additional comment. The idea of dedicated areas can in fact have positive value in places occupied by traditional communities that have special territorial rights. Giving the exclusive right to extract minerals under the ASGM regime to these communities is potentially an interesting option. However as mentioned above this exclusivity is difficult to maintain and that is the lesson from Colombia, which has Afro-Colombian and indigenous communities with special rights associated with land use. The new mining code reform transformed this right of exclusivity to a right of first refusal with a very limited timeframe in which to exercise it.^{xliii} The new restrictions in this Act could have constituted a problem for these communities to undertake the necessary activities and completely jeopardize the initial objective behind the creation of these areas. Fortunately, this new code was declared unconstitutional in June 2011 because of the lack of consultation.

C. Person(s) to Perform ASGM Operations

One of the key debates surrounding who can perform ASGM activities regards the question of national or foreign persons. There appears to be a tendency to restrict these activities to nationals, as in the case of Tanzania, Ghana, Ethiopia, Cote d’Ivoire, Sierra Leone, and the Philippines.

In Sierra Leone, artisanal mining is restricted to its own citizens exclusively, or to a corporation that has been incorporated or registered in Sierra Leone with 100% of its shares held by citizens of Sierra Leone. It is the same in the case of small-scale mining, except that a corporation that has been incorporated or registered in Sierra Leone only needs 25% of its shares to be held by its citizens.

This approach is also followed in the Philippines with some minor differences. Artisanal mining (gold panning and sluicing permits) is restricted to Filipino citizens and small-scale mining is restricted to Filipinos and legal entities with 60% Filipino ownership. There is also an interesting disposition that allows local persons to have priority to obtain mining titles.

Accepting foreign capital as part of ASGM, even in a minority position, can have two consequences: national capital can experience difficulty in competing (this is when the disposition of priority for local persons can be very interesting although this depends on the definition of “local”); and/or the foreign mining sector may prefer to operate under a small-scale regime rather than a medium and large scale-regime in order to obtain the associated economic incentives and simplified titles attribution requirements.

It is important to remember that a primary objective in promoting this activity is to address poverty issues within the country and, clearly, the implications of opening ASGM activities to foreign capital can unintentionally create obstacles to this objective.

While the involvement of foreign capital may be problematic in its own right, the question of foreign workers is another issue that requires close consideration because of the potential social implications of any prohibitions in this matter. Dealing with this through harmonization at a regional level has several obvious advantages.

A final aspect that is important to analyze with regard to the holder of ASGM mining titles is the restrictions imposed or the promotion of some specific types of “persons” or entities (e.g., cooperatives) by the regulations, which is a common tendency in ASGM legal frameworks.

In Bolivia and Brazil, ASGM is almost exclusively performed by cooperatives. In Bolivia’s new ASGM draft law there is openness to other legal entities, with discussion of establishing a special legal regime only for cooperatives.

The production cooperative can be a practical entity for ASGM operations since it is a workable configuration for economic relations between people who are, or would like to be, working together. Specifically, it is a structure in which people must contribute with capital to participate and its members are the owners and workers. Cooperatives, by definition, do not have employees, with the exception of administrative personnel. Cooperatives may serve as interesting examples of service providers (e.g., rental of machines and equipment, selling basic goods and supplies, or even providing credit) which are all important issues in ASGM.

Nonetheless, allowing cooperatives to be the only legal entity for ASGM operations can be problematic for various reasons, as has been the experience of Brazil and Bolivia. Forcing operations to be organized as specific legal entities without providing other alternatives can create distortions in these entities. In the case of Bolivia, a significant number of the cooperatives in fact have the economic structure of companies. The consequence is that the workers are not considered part of the cooperative and do not have the right to vote. They are “volunteers”. A similar phenomenon is occurring in Brazil.

Of course, there are exceptions and it is possible to find real cooperatives in ASGM, but the majority of the economic relationships between the miners are more typical of a formal company (i.e., a small group of persons that have the capital and a much larger group of workers).

4 considerations for rights associated with mining title

1. Restricting ASM mining titles to nationals may be important to fully realize the role of the sector in poverty alleviation
2. Diverse forms of business entities could be allowed to be holders of artisanal and small scale mining titles
3. Association promotes a formalized and entrepreneurial sector and should be encouraged with clear concrete measures: economic incentives, simplified legal requirements for associations and partnerships, and allowing different business models (e.g., consortium, joint venture, and old concepts like the “comandita” company)
4. Allow the transfer and upgrade of mining titles through the regulatory framework with the objective of creating the legal conditions for better management of mining operations

This means that careful attention should be given to the promotion of specific business entities in terms of evaluating the implications and potential distortions that these may cause. Incentives can be given but must be done so in a balanced way that reflects actual structures and operations. In principle, it is best to avoid restrictions to any form of business entity because of the risk of forcing the actors to try to become, in appearance, what they are not in practice.

Additionally, it is important that the miners have the option to choose from diverse types of legal entities (solo companies, cooperatives, limited and unlimited responsibility companies, etc.) Diverse forms also can contribute to a diverse ASGM sector that can range from the solo companies (the common situation of family businesses) to more sophisticated models of small-scale legal entities, appropriate to different levels of savings, and different dimensions and qualities of mineral deposits.

Association between different types of businesses and operations is another important related issue for ASGM. The association and collaboration between ASGM and medium and large-scale mining is also a fundamental aspect that can contribute to the development of a formal and more effectively entrepreneurial sector.

Very commonly, the regulatory framework defines association as a fundamental principle but does not create the conditions and incentives to promote these partnerships. This is, for example, the case in Ecuador and Uganda. To promote business associations it is necessary that the titles are not restricted to individuals, that there are mechanisms that allow for joint areas and titles, that creative economic incentives are available, and finally that different business entities, including consortia and joint ventures, are allowed under the law.

D. Transfer of Rights and Mining Titles Upgrades

The ability to transfer mining title rights provides a powerful incentive for mining operations to enter into the legalization process. The current tendency is not to give this right to ASGM mining titles (Table 4). When it is given it usually only includes small-scale mining titles and only exceptionally does it include artisanal mining titles, as is the case in Peru and Ecuador. In Peru, the transfer of rights inside the ASGM sector is not allowed. When the regulatory framework does allow for transfer, the costs are high because the only choices are between small and large-scale mining licences which are vastly different in complexity, such as in the case of Uganda.

Any limitation to this right can generate significant distortions in terms of economic relationships and questions about the relevance and value of legalization. Limitations, or an inability to attribute this right in ASGM activities, means that access to official credit is not possible, investments will be lost in the case of deaths of individuals, or that projects must close when they exceed the level of technical and economic capacity of the ASGM and cannot be transferred to another company (e.g. a medium or large-scale company).

In practical terms everyone loses: the title owners; families of the title owners; the government; and the national economy. The transfer of rights is a fundamentally important right that will enable a legal market of mining titles to develop, which can be beneficial for the mining sector of the country.

While the transfer of rights is almost a “taboo” for ASGM regulatory frameworks, the upgrading of mining titles is not even considered as part of the right of an ASGM mining title. Upgrading, as a mechanism for the mining producer organization, can be a powerful tool for the gradual improvement of the mining operation. Any process of ASGM development will be gradual because of the limited capital availability in the sector, the difficulty of accessing credit, and because the knowledge and entrepreneurial culture takes time to build. (Even if credit schemes provide for the ASGM sector the pace of change still will be slow compared with that of LSM.)

Table 4: Right to Transfer (Partial or Total) the Mining Title by Country

Country	Category of title	Transfer of rights
Brazil	Garimpeira Permission for extraction	No clarity
Cote d'Ivoire	Small scale mining authorization	No
	Semi-industrialized mining authorization	
Ecuador	Artisanal mining permit	No
	Small-scale mining concession	Yes
Ethiopia	Artisanal mining licence	Yes
	Small scale mining licence	
Ghana	None specifically stated	Yes
Mongolia	Artisanal and Small-scale mining	No
Peru	Small concession	Yes
	Artisanal concession	
Philippines	Small scale mining permit and contract	No
	Artisanal mining (Gold panning and Sluicing permits)	
Sierra Leone	Artisanal licence	No clarity
	Small scale mining licence	
Tanzania	Primary exploration	No
	Primary exploitation	Yes
Uganda	Location licence	Yes
	Mining lease (more than US\$ 5,000)	
Zimbabwe	Reconnaissance licence	No clarity
	Prospecting licence	
	Mining licence	
	Artisanal licence	

Sources: Various sources – see references^{xliv}

Some regulations do allow the mining authority to adjust or correct the category that the potential holder of the mining title can request (e.g., Ecuador). In Uganda the upgrade from location-based licence to mining lease is allowed but because there are only two kinds of mining licences (artisanal and small-scale mining or large-scale mining) it is not a realistic option because it comes with the obligation to do a full environmental assessment, a feasibility study, and a detailed and fully costed Mine Development Plan. A similar situation exists in Peru.

One way to make the upgrade available to the ASGM sector is to create different categories of operations associated with different mining titles. This approach could allow for the gradual development of the operation.

To ensure the necessary controls and capacities through operations expansion, any upgrade mechanisms should be based on a process of formal authorization and registration with the mining authority responsible for mining titles management.

III. ENVIRONMENTAL LEGAL FRAMEWORKS TO CONTROL THE USE OF MERCURY AND OTHER MAJOR ENVIRONMENTAL AND SOCIAL IMPACTS^{xlv}

A. Environmental Assessment Instruments and Environmental Licences

In most countries, obtaining an environmental licence is part of the legalization process for ASGM. The environmental licence requires an environmental impact assessment and an environmental management plan outlining measures to prevent or mitigate the potential impacts.

The goal of simplifying the attribution of mining licences for ASGM is also a relevant subject in the case of environmental licences. Simplifying both the environmental impact assessment process and environmental management planning and reporting requirements without affecting environmental protection is based on establishing requirements and processes associated with different categories of ASGM and corresponding mining titles. This approach is being used in Peru where small-scale mining concessions must present a semi-detailed environmental assessment while artisanal scale mining presents an environmental impact declaration. This kind of approach could be more effective if it were applied using more than two basic categories.

In some countries, like South Africa and Nigeria, the environmental impact assessment and the management plan is the same regardless of the size or the category of mining title (in the extraction phase). This is not recommended because it does not take into consideration the differentiation of the impacts that are linked to the relative size of the mining operation.^{xlvi}

Some jurisdictions assume that ASGM does not have the capacity to develop environmental assessments or environmental management plans and as a result is exempt from these regulatory demands. The actual extent of this capacity deficit and the degree to which ASGM should be expected to perform these environmental activities depends on a variety of specific realities of the country and its ASGM operations along with the complexity of the environmental instruments being employed.

Despite these many variables, it is fair to say that it is important to have some kind of assessment and management plan for ASGM mining operations, but it is equally important to understand that instruments can be simplified through the terms of reference and respective administrative requirements. In some cases they can be very simple instruments such as a list identifying potential

5 considerations for environmental licences

- 1) It is crucial to have a specific environmental regulatory framework for ASGM
- 2) This specific framework aims to create the conditions for both environmental protection and economic development of the sector
- 3) Evaluation of the environmental impacts and specific guidelines for addressing them should be required for all categories of ASGM
- 4) The environmental instruments such as EIA, management plans, and requirements for attribution of environmental licences should take into consideration the negative impacts that different sizes of the mining project generate
- 5) Simplification of environmental requirements (e.g., one title that includes the environmental licence and management plan), without reducing the environmental controls, is valuable for the mining operations but also for the government in dealing with its capacity to meet regulatory demands

impacts. The set of environmental and social requirements that should be followed by the operator to mitigate or prevent them can then be included in the environmental licence. This kind of simple and practical instrument can have a great impact on environmental improvement because it is a mix of a licence, action management plan, and education tool.

The engagement of the government in the development of simplified environmental instruments or in assisting the potential licensees through specific capacity building centres can be crucial for the successful implementation of regulatory measures.

The process for attribution of the environmental licence is also an important element for simplification. One single application licence that includes an environmental assessment and management plan (including closure measures) can be a very practical approach for both the mining operation and the government. It is critical to remember that it is not only the mining operation that can have problems implementing the regulatory measures – depending on the regulation, the government can have problems implementing such regulatory acts or responding to the demands generated by them. If the ASGM legalization is a success it could mean processing thousands of applications for mining titles and environmental licences annually. At the beginning of any successful legalization process this volume could be multiplied by 5 or 20 depending on the size of the ASGM sector in the country.

B. Pollution Control Regulations

Environmental frameworks are more than environmental licences and related instruments (EIAs and management plans). The next sections will cover the main environmental topics that are part of ASM legal pollution control frameworks and will identify the key information that can provide useful inputs for improving such frameworks.

This section is especially important because legalization of mining activities usually focuses on mining licenses and environmental licenses, and the other requirements tend to be considered as marginal.

In the case of the ASGM sector, prevention or minimization of pollution is related more to the regulatory measures analyzed in this section, such as for mercury and cyanide, than it is to the licenses *per se*. This is because pollution control measures for ASGM that are prescriptive and specific (while avoiding the creation of unwarranted obstacles) are a necessity, as they clarify in concrete terms the obligations of the mining operation. Generic and abstract concepts do not help ASGM to meet its obligations.

i. Mercury and Cyanide Regulations

Mercury

In the last 20 years, knowledge about the use of mercury in the ASGM sector, its impacts, and ways to drastically reduce such impacts on people and the environment has increased substantially through national and international projects.

That said, it is surprising how little of the knowledge about mercury use or cyanide use has become effectively integrated into regulatory measures that could prevent and control the pollution caused by these two substances, which are used in gold processing worldwide.

In the case of mercury, years of research and experience in the field working with ASGM were in part consolidated in the document, “UNIDO Technical Guidelines on Mercury Management in Artisanal and Small-Scale Gold Mining.”^{xlvii}

The document aims to assist governments in the development of legislation and regulation in the following areas:

- (1) reduction of ASM-related mercury emissions into the environment;
- (2) reduction of occupational and second-hand exposure to mercury;
- (3) elimination of the major inefficient and unsafe practices of mercury use; and,
- (4) reduction of unsafe storage and disposal of mercury.^{xlvi}

Specifically, the document makes recommendations on technical issues as indicated in Table 5.^{xlix}

As a start, these guidelines could be translated into regulatory measures and further guidance could be elaborated as appropriate. For example, Guideline 1 notes that: “The mining licence holder or gold shop owner should: (a) institute reasonable safety measures to prevent the exposure of employees or other persons to mercury fumes...” This general statement and principle around “reasonable safety measures” would need to be translated and expanded into specific legal measures or guidelines

In many ASGM operations, the lack of preventative measures is due to a combination of a knowledge gap and the absence of appropriate solutions that are practical for the realities of the sector’s production technology, economic restrictions, and labour relations. In this context, generic statements of principle do not help unless they are followed by specific solutions or guidelines. In the case of Tanzania, the environmental regulatory framework is clear and easy to understand but is experiencing difficulty in its implementation because it largely provides principles rather than specific guidelines.

Regulatory approaches to mercury technology are further discussed below.

12 considerations for pollution control

- 1) Limitation of technical capacities of the ASGM operations suggests that environmental regulation should be prescriptive and descriptive; a combination of legal instrument, guidelines, and educational material
- 2) Knowledge of the use of mercury and cyanide should be incorporated into regulatory guidelines applied to the ASGM context
- 3) Specific mining and environmental framework should apply for ASGM mining in river beds to prevent and minimize the environmental impacts that today are a reality in these very important ecosystems
- 4) Further research should be done to identify the best way to address this reality in legal terms
- 5) The regulatory framework should clearly address the requirements for buying, using, and storing explosives in the context of ASGM
- 6) Capacity building in explosives use and storage (including construction for storage) is very important and should be adapted to the reality of ASGM
- 7) Consultation and mining closure are relatively new areas for the mining sector but should be part of the legal framework of the ASGM sector in accordance with ASGM reality
- 8) Comprehensive regulatory guidelines should be provided in these two areas based on different categories of mining titles
- 9) Corporate social responsibility (CSR) is a reality in some segments of the ASGM and ASGM public policy should address this
- 10) CSR research should address the particular socio-economic situation of the sector and the relationship between this sector and the surrounding communities
- 11) Any legal restriction on the use of technology, methods, or processes should be evaluated carefully in terms of impacts of such restrictions in the sector
- 12) Any restriction should be accompanied by accessible alternatives in terms of the performance, cost, availability, and technical complexity in use

Table 5: *UNIDO Technical Guidelines on Mercury Management in Artisanal and Small-Scale Gold Mining*

<p style="text-align: center;">III. Implementation</p> <p>Governments should identify the authority responsible for implementation of these guidelines, and make any appropriate modifications to the technical measures for inclusion in new mercury laws, policies, or regulations. It is recommended that such policies be adopted under the clear jurisdiction of authorities that are responsible for small-scale mining issues, in consultation with other relevant authorities, recognizing that such authorities may be best suited to conduct monitoring.</p> <p>Local-level governance and community-based monitoring systems are strongly encouraged. Community stakeholder participation in the processes of policy development and field implementation is critically important.</p> <p>Governments should provide ways to legalize the artisanal and small-scale miners as well as educate them on environmental management. Technological assistance and capacity/education services should be provided in all areas where there is a high concentration of small-scale miners.</p> <p>These guidelines apply to all legal operations where mercury is used to amalgamate gold, amalgam is being burned or retorted, and gold is being melted. These guidelines provide minimum threshold standards that significantly reduce mercury emissions and exposure where properly implemented. However, in all cases possible, miners should be encouraged to adopt appropriate mercury-free mineral processing methods.</p>
<p style="text-align: center;">iv. Principal technical measures</p>
<p>1. Responsibility of employers of mines/processing plants/gold shop operations</p> <p>In all cases, the primary mining/ore processing licence holder and gold shop owners should be held legally responsible for safe practices, including those involving mercury. The mining license holder or gold shop owner should institute reasonable safety measures to prevent the exposure of employees or other persons to mercury fumes.</p>
<p>2. Licence to work with mercury</p> <p>All licensed operations where mercury is used or handled should obtain a special licence specifically for mercury use at their facility. When miners apply for mining licences, and before beginning operations, miners should demonstrate awareness of how to comply with these guidelines</p>
<p>3. No whole ore mercury amalgamation</p> <p>No person should amalgamate the entire ore, through the use of a mercury-copper plate or by sending mercury directly into any gravity concentrator, centrifuge, or ball mill, Chilean mill, or stamp mill.</p> <p>This causes mercury flouing which reduces recovery and causes a large proportion of mercury to be lost to the environment with tailings. Amalgamation must be used ONLY for gravity concentrates.</p>

4. Mercury amalgam burning

No person should heat/burn mercury amalgam to recover the gold without using a retort. Retorts contain and condense the mercury vapour releases and should be used to recycle mercury (in the form of a bowl retort, pipe retort, hood, etc.)

Amalgamation burning must not take place in domestic residences. It must be done at a distance (say MORE THAN 500m) from any house. Children or pregnant women must not be present during the retorting activities.

5. No mercury-cyanide interaction

No person should use mercury in conjunction with cyanide, or conduct cyanidation of mercury-rich tailings as this practice increases mercury methylation.

6. Amalgam barrel

Amalgamation of concentrates must NOT be conducted manually. This must be conducted in small plastic or steel rotating barrels with rubber balls or a chain inside to increase the homogenization of the mixture of concentrate and mercury. Amalgamation time should be kept as short as possible. Amalgamation should be controlled and stopped, if no visible free gold can be seen. The amount of mercury added into the barrels must be gradual, until all free gold is caught.

No cyanide or potassium permanganate or any other oxidizing agent must be allowed to be added to the barrel; a dash of detergent is enough to clean gold particle surfaces. An amalgam separator such as an elutriator must be promoted to separate amalgam from heavy minerals after amalgamation. A carpet sluice placed after the elutriator will ensure that the fine mercury is captured.

7. Centralized amalgamation sites

Amalgamation and retorting should only be conducted in designated sites (amalgamation pools and isolated retorting places) at least 500 m away from any inhabited place. For any mining location where amalgamation occurs, the primary license holder or mine manager shall designate a portion of the mining location as the prescribed structure, facility, or locale where amalgamation may take place. Amalgamation may only take place in such structure, facility or locale. The holder of an ASM license shall ensure that washing or settling ponds are constructed in his or her licence area to provide for washing and sluicing, and no such washing and sluicing shall be done along or close to rivers, streams, or any other water sources.

8. Protection of water bodies

No person should conduct amalgamation, or separation of amalgam from concentrates, or retorting, or burning of amalgam in any natural water body or within a distance of 100 metres from any natural water body, including rivers, streams, lakes, and other water bodies. Amalgamation tailings must not be discharged into a water body or in places susceptible to flooding.

9. Protection of residential areas

No person should use mercury for amalgamation or any other purposes in residential areas or within a distance of 100 metres from any residential areas, including villages, towns, cities, or settlement areas.

10. Disposal of mercury or mercury-contaminated tailings

Any disposal of mercury-contaminated tailings should be done in a safe and proper way. No person should discharge mercury-contaminated tailings into a water body or in places susceptible to flooding. Disposal of mercury-contaminated tailings must be done by placing it on a clay or laterite soil-lined pit of several metres depth, located 100 metres away from any water body.

When the hole is filled with mercury-contaminated tailings, this must be covered with 1 meter of clay or laterite, then compacted, covered with soil, and re-vegetated.

11. Extracting residual gold from mercury-contaminated tailings

Mercury-contaminated tailings must not be recycled to the concentration circuit once this contaminates the primary tailings. If any process is to be applied to recover residual gold from mercury-contaminated tailings such as leaching with cyanide, thiourea, etc., the residual mercury must be removed (e.g. by gravity concentration) prior to leaching. The effluents and tailings from gold extraction must still be treated as mercury-contaminated tailings and must be buried.

12. Condensers for gold shops

Any shop buying retorted gold, or any shop that is retorting gold, must have a proper fume hood installed to capture, condense, and recycle mercury. The design of the fume hood should be such that over 90% of the mercury is captured.

13. Storage of mercury

Metallic mercury should be stored safely at all times when not used: (a) in a secure location that is inaccessible to children; and (b) in unbreakable air-tight containers that are covered with a thin layer of water (e.g., 1 centimetre) to prevent mercury evaporation. Mercury should NOT be stored in a domestic residence.

14. Protection of pregnant women and children

People who perform amalgamation, retorting, melting gold, or handling mercury must ensure that no pregnant women, or children under the age of sixteen, enter the structure, facility, or locale in which mercury is being used.

15. Mercury-free methods

The above guidelines demonstrate minimum threshold requirements. These measures significantly reduce mercury emissions and exposure where properly implemented. However, in all cases possible, miners should be encouraged to adopt appropriate mercury-free mineral processing methods. For small amounts of concentrate, the blowing-tapping method should be promoted.

Source: Global Mercury Project, April 2008¹

Cyanide

Cyanide has been less studied than mercury in the context of ASGM and the majority of the technical knowledge has come from the use of cyanide in the large-scale mining sector. Again, it is surprising that so little of this knowledge has been incorporated into regulatory measures, not only for ASGM, but also for the mining industry in general. In the absence of common regulatory measures, the mining industry has developed a range of “best practices” which were recently consolidated in the International Cyanide Management Code.ⁱⁱ

It is important to understand that the:

Code is a voluntary initiative for the gold mining industry and the producers and transporters of the cyanide used in gold mining. The Code focuses exclusively on the safe management of cyanide that is produced, transported and used for the recovery of gold, and on cyanidation mill tailings and leach solutions. The Code originally was developed for gold mining operations, and addresses production, transport, storage, and use of cyanide and the decommissioning of cyanide facilities. It also includes requirements related to financial assurance, accident prevention, emergency response, training, public reporting, stakeholder involvement and verification procedures.ⁱⁱⁱ

The code was intended to complement existing or future regulatory requirements.

The International Cyanide Management Institute (ICMI) administers the Code and manages the certification process. The ICMI developed a third party certification process based on Code standards. The signatory companies have adopted the Code and are committed to bringing their gold mining operations into compliance with it within 3 years of becoming a signatory. There are 20 gold mining companies, 12 cyanide producers, and 16 cyanide transporters that have become signatory companies.ⁱⁱⁱⁱ

The Code and the compliance system that was developed focus on large and medium-size operations and it would be a valuable initiative to identify the possibility of adapting the Code to ASGM conditions. Specific guidelines that suit ASGM operations would be useful for mining operations and for legislators in terms of providing technical direction based on international experience.

Regulatory measures covering environmental contamination standards for substances like mercury and cyanide in diverse environment elements (air, soil, and water) are important instruments that should be in place to allow for effective monitoring and management of mining operations. Without clear limits and thresholds for action, the concepts of pollution and contamination become abstract concerns rather than areas of accountability. The case studies show that it is an area that deserves attention because these environmental limits are often incomplete or non-existent in the regulatory framework.

ii. Mining in River Beds

Alluvial extraction in riverbeds or any watersheds can be very destructive when it involves the use of dredges. Unfortunately, this is common practice in important ecosystems such as the Amazon region (Brazil, Guyana, Peru, Colombia) and the Chocó region of Colombia. However, the regulations do not provide clear guidelines to prevent or minimize the environmental and social impacts of these types of operations. In the few cases where regulations do deal with it, they tend to take the easy but inefficient route of imposing a blanket prohibition on this type of activity. The mobile nature of these operations and the remote locations of the deposits mean that enforcement is difficult and expensive. In practical terms, prohibitions are often meaningless.

There are, however, alternative regulatory approaches that can be employed to prevent and/or mitigate impacts from alluvial extraction by dredges. Regulations can be developed that directly

address different aspects of the problem through conditions that can be imposed on mining titles and environmental licences, for example:

- different types of mining titles can be administered, corresponding to different environmental requirements depending on the size of the operation;
- size of operation can be limited by unit extraction capacity;
- specific processes and equipment that should be forbidden due to their severe health, security, or environmental impacts can be targeted;
- limits can be imposed on the number of units that can operate in specific areas of the river through attribution of a limited number of permits;
- significant alteration of the river/watershed course can be prohibited;
- removal of vegetation along the river margins can be prohibited;
- the UNIDO guidelines identified above apply to the processing of gold, but address the specifics of dredge operations.

These suggestions are not a substitute for the need for enforcement but are based on the idea that the main protector of the mining title is the owner of the title and thus a powerful ally in the enforcement.

Another indirect way to prevent impacts is to assign mining titles and other incentives in areas outside of the riverbeds as a way to redirect the energy and attention of miners interested in the best economic returns. In the current context, it can be argued that it is largely the complete lack of any public policy that allows and encourages people to move wherever they believe there is more gold or where the authorities are less present to enforce the rules. This analysis underscores the value of filling the void with strategic, practical, public policy to direct priority areas for reform in mining practices.

C. Other Relevant Requirements

i. Explosives

Explosives are important technological inputs for the extraction process of minerals, especially for hard rock deposits. Unfortunately, existing regulatory frameworks do not deal with this effectively. The tendency is to forbid the use of explosives (e.g., Ghana), which, in practical terms, often means that the explosives will just be more expensive and will be used without any security measures.

Countries like Peru, Zimbabwe, and Tanzania have had some positive experiences in which they have employed regulatory measures aimed at licensing, training, and storage of explosives. The following are three examples that illustrate approaches focusing on collaboration and finding technical solutions to regulatory barriers:^{iv}

Mobile explosives storage boxes – Tanzania

The Department of Mines has designed and commissioned explosives storage boxes that small-scale miners can acquire from it. The metal storage boxes are lined with timber and are sold at a nominal fee to recoup production costs.^{iv}

Sharing explosives storage facilities with large-scale miners – Zimbabwe

In the Shamva area in Zimbabwe the owner of one large-scale mine allowed small-scale miners to store their explosives in the LSM facilities, an example of cooperation between large and small-scale miners.

Sharing explosives storage facilities between miners – Tanzania

The National Services (Army) runs a small-scale limestone quarry in Kunduchi, Dar es Salaam with a crushing plant and uses explosives for rock blasting. The quarry operation also has its own

explosives magazine located in the mining area. Close to the quarry, there is a group of artisanal miners exploiting the same limestone reserves. Miners employ manual drilling followed by blasting of a few holes at a time to dislodge the limestone blocks. A “contractor” who has a blasting certificate, and is paid by the miners after they have sold their aggregates, usually carries out blasting in the area. However, storage of explosives was still a problem. The National Service quarry unit made available its facilities to the small-scale miners. They lock their explosives in portable authorized explosive boxes.^{lvi}

These examples show creativity in addressing regulatory barriers but also highlight the importance of ASM regulatory frameworks in dealing with the storage of explosives in a practical way – guidelines that the ASM operations can apply, for example regarding where they build their own explosives magazines without needing to be close to LSM operations or alternatively using mobile storage. The latter can be a very good solution during the work day, for transportation and storage, but is not a realistic solution for storage of explosives during non-work hours.

ii. Rehabilitation and Mine Closure

Rehabilitation and mine closure is a relatively new area for mining in general and for ASM in particular. As much as rehabilitation is part of the mining legal framework for most countries, the concept of mine closure, as one of the mining phases that comes with an obligation to return the mined area to a state that does not pose a risk to communities or the environment, is still not well recognized in many jurisdictions.^{lvii} It is interesting that in some jurisdictions, mine closure is not an obligation for large-scale mining but has become an obligation for ASM (e.g., Mongolia).

Independent of the novelty, rehabilitation and mine closure is an important topic and is one that is necessary to address as part of the formalization process. Currently, where there are obligations to close a mine or to rehabilitate the mining tenure area, the regulations are often abstract and tend to default to the process for medium and large-scale mining.

In the case of ASGM, the regulatory framework should pay attention to the following aspects of closure:

- Obligations should be linked to the size of the operation. The easiest and most effective way to do that is through different ASGM categories;
- Assessments and closure planning processes can be simplified appropriately to the scale of the mining, processing, and refining operations;
- Give specific guidelines for the closure or rehabilitation based on key variables (e.g., mineral substance extracted and the kind of deposits (primary or secondary deposits, type of land use – protected area or special socio-cultural area, and type of ecosystem);
- Consider opportunities to make rehabilitation or mine closure part of a business activity that can include extraction of existing gold and related precious metals from tailings impoundments while simultaneously undertaking the rehabilitation and closure activities.

iii. Community Consultation and Corporate Social Responsibility

Community consultation, as a means of obtaining a “social licence” to operate, is an issue similar to mine closure. It is relatively new to the mining sector in general but it is an important subject at different levels. In practical terms, it is very difficult and sometimes impossible to operate in an area that is in conflict with surrounding communities.

Similar again to mine closure, the regulation of consultation processes and related engagement obligations should consider:

- Consultation processes and requirements that are appropriate to the scale of the mining and processing operations;
- Specific legal guidelines for community consultation as a function of the size of the operation and type of land use (protected areas, special socio-cultural areas, and type of ecosystem).

While one characteristic of “social licence” is a continuing consultation process during the lifetime of the mine it is also occurs through an active commitment to a broader corporate social responsibility (CSR) program. CSR reflects many aspects such as human rights, treatment of labour, the environment, consumer protection, health, fighting corruption, and transparency in reporting. Social responsibility has been described as, “an organisation’s obligation to maximise its positive impact on stakeholders and minimise its negative impact,” or, “business decision making linked to ethical values, compliance with legal requirements, and respect for people, communities, and the environment around the world” (Aaronson 2003). More simply and eloquently, CSR is, “doing the right thing even when no-one is looking,” (Anonymous 2006a).^{lviii}

Typically, CSR has been associated with large-scale companies, however, there are two very interesting CSR case studies in Zambia, which involve companies that are legally constituted small-scale mining companies that are highly organized and utilize relatively advanced equipment and mining methods. These operations are referred to as “advanced small-scale mining”. In the country there are about 10 mechanized mines, with licensed plots of between 1.5 hectares and 45 square kilometres. (See Boxes, Zambia Case Study 1 and Zambia Case Study 2.)

Zambia Case Study 1: Grizzly Mining Limited

***Grizzly Mining Limited** started full-scale operations in 1999. The mine is located in Lufwanyama District and is involved in mining and exporting of gemstones. The Company has invested more than US\$ 8 million in machinery and other mining equipment. Currently the Company employs about 350 full time employees and up to 70 casual workers per year. The Company also claims that 60% of its workforce comes from the Lufwanyama District which, in a sense, contributes to employment creation and poverty alleviation in the area. Like all gemstone mines, the mine is fully operational from April to December due to weather.*

Grizzly Mining Limited is involved in some community projects as part of its social responsibility practice. In 2003, the Company donated blankets and mattresses to Kitwe Central Hospital, Mufulira Home for the Aged, and Luanshya Hospital. The Company spent about US\$ 30,000 on these activities. The Company has also built a community school in Lufwanyama at the cost of US\$ 14,000. The school has about 200 pupils and runs from grades 1 to 7. The Company also claims to have built houses for the headmaster, the deputy, and a senior teacher although an on the spot check revealed that this is not the case. The Company has sunk boreholes at a cost of US\$ 17,200 and has also built a clinic for its employees. It is also involved in a joint project to build a road from the Pirala area to Kalulushi - a distance of about 30 kilometres. In 2000, Grizzly Mining also sent five heavy-duty equipment operators to South Africa for training. (...) The Company should address the question of sustainability after the mine operations cease. In an interview with the Mineworkers Union of Zambia (MUZ), it was revealed that Grizzly Mining Ltd. has not signed any recognition agreement with the Union.^{lix}

While the scale of these operations raise some important questions as to what legitimately can be called small-scale mining this study highlights issues around corporate social responsibility that can and should be part of the ASGM sector discourse and practices. That said, it must be noted that there are some differences between gold and gems in terms of what is considered small and the corresponding potential to make economic contributions from the companies to the communities. As well, it is important to note that corporate social responsibility from an artisanal or small-scale mining perspective will necessarily be different from that of advanced small-scale mining.

Zambia Case Study 2: Gemfields Resources Plc

Gemfields Resources Plc is an incorporated company operating gemstone and amethyst mines in Zambia. In November 2005, Gemfields Resources started trading on AIM (Alternative Investment Market) in London. After placing its shares on the stock exchange by Canaccord Capital (Europe) Ltd. it raised £ 12.5 billion before expenses. The Company owns many Zambian emerald mines, namely Kamakanga (100%), Mbuva (100%), Chibolele (100%), and ARNUS (100% but subject to deferred payment). The Company obtained the contiguous Chibolele and Mbuva licences of the Fwaya-Fwaya Pirala belt. This belt contains about 950m of strike length and three small pits reported to have produced emeralds.

As Jeremy Clarke, CEO of Gemfields, puts it, “Gemfields can significantly improve profitability through the operational consolidation of these projects and the application of modern open pit mining techniques already in use in the wider mining industry”. It should however be pointed out that consolidation might mean wiping out the presence of the small-scale entrepreneurs in the area. For the operations to be sustainable, it is desirable that there are Zambian entrepreneurs in the company. It is therefore desirable to offer some of the shares locally.

Gemfields is a new company. Its corporate social responsibility policy is not yet well known. The company is, however, building a clinic in chief Nkana’s area. The company is in talks with the Mineworkers Union of Zambia to have its employees unionized. Currently, MUZ is optimistic that a recognition agreement can be signed. This needs to be speeded up as the conditions of service for mine workers can only be safeguarded and improved once the process is formalized.^{lx}

The interesting lesson is that the approach of these two companies to CSR is very much focused on providing assistance to the community in similar essential areas like schools, hospitals, and roads. Very exceptionally, these companies consider more community development-oriented actions such as sustainability of the community after the closure.

The short-term transactional approach to CSR for large-scale mining has been heavily criticized by the CSR literature in contrast to efforts that focus on activities and programs that contribute to the longer term development and sustainability of the community.^{lxi}

In the context of African rural communities and the ASM sector (including advanced ASM), schools, hospitals, and roads are basic development issues and in this sense the pragmatic contribution of the two companies to these outcomes should be given appropriate credit.

Nevertheless, it is important to understand that CSR is not only about these activities for either ASM or LSM. As mentioned previously, it includes human rights, labour relations, environmental and consumer protection, health, fighting corruption, and promoting transparency in reporting. And the questions here are: how much is it possible to ask ASM to deliver in CSR? What does CSR mean in the context of ASM?

This is a subject that has not received much attention to date but is worthy of analysis and creative policy development.

D. Restrictions on Technology Use

In a substantial part of the legislation of ASM, legislators have chosen to attempt to control potentially harmful activities or techniques (and related environmental and social impacts) through technology restrictions.

One approach is to use the definition of ASGM to limit the capacity of machines and equipment by using concepts like “rudimentary” or allowing only hand tools. As discussed before, this kind of control can also be achieved by limiting the volume of material extracted with the same results on impacts of concern without the potential problems of enforcing rules on a sector that would inadvertently preclude any possibility for advancements in economic returns, work conditions, or environmental protection.

Another approach is to identify the processes that are creating environmental problems and simply prohibit them. For example, in several regulations ASGM operations are prevented from using cyanide (e.g., Brazil) and in others the target for prohibition is mercury (e.g., Mongolia).

If appropriately applied, technology restrictions or guidance can be a good way to control economic activities, especially in terms of social and environmental impacts^{lxii} and there is little doubt that they could be used more throughout legal frameworks. However, in applying this tool, the restrictions should avoid imposing unnecessary (non-impact-related) obstacles and any associated limits on economic growth, development, and competition. The focus should be on ensuring the desired environmental and social outcomes, as opposed to the technology itself.

The literature regarding the use of technology restrictions applies to economic sectors as well as recreational activities, such as hunting or fishing. It is important to note the difference between recreation activities and economic activities in this regard, and the need to focus on economic sector solutions. Restrictions on recreational activities can effectively be imposed to limit when, where, and how many animals/fish are caught because these become part of the recreational challenge and are not strictly considered as a cost. This is very different from economic activities where the restrictions should take into consideration the nature of profitability of the activity.^{lxiii}

Another important aspect to remember about the use of technology restrictions (or similar regulatory strategies) is that they are often not imposed equally on medium and large-scale mining operations, which means that the costs associated with restrictions only impact ASGM. They do not have a market impact on the price of gold and as a result there is a price on the technology inputs that is only borne by ASGM.

Development of lines of credit to improve technology that is less damaging to the environment or that better reduces impacts to the environment and surrounding communities is definitely an area to which public policy should dedicate attention (see further analysis in the section below).^{lxiv}

If the objective of this approach is to use technology restrictions as a means to fundamentally limit ASGM, evidence of its success is mixed, at best. The result of technology restrictions can be very dramatic, especially when the sector has a low education level, limited availability of financial resources, and no other comparably profitable economic alternatives. The scenario of miners processing gold inside their homes (in kitchens or bedrooms) with children present or at night in order to avoid legal prosecution is, regrettably, not uncommon.

Mongolia is one important example of this phenomenon because in 2008 it prohibited the use of mercury for ASGM. To address the technology gap, the government, in partnership with the SAM project, launched an initiative that included a pilot plant, which is mercury and cyanide free. The following case study example describes the details, challenges, and opportunities arising from this program.

Mongolia: Bornuur Mercury Free Processing Plant for Hard Rock Gold Ore

The Bornuur pilot plant was established to carry out experimental work in mercury-free technology for gold extraction. Mercury use was banned in February 2008 and left approximately 500 miners in Bornuur without a source of income because after the confiscation of ore processing mills miners ceased all mining activities. In an effort to provide a way to continue primary gold processing, the project embarked on establishing a pilot plant to investigate various gravity concentration devices which could be used for gold recovery without the use of mercury and cyanide. A suite of equipment with different milling and recovery characteristics was assembled and tested for gold recovery with different types of gold bearing ores.

Generic project information:

<i>Project location:</i>	<i>Shar Khooloi area, Bichigt Bag, Bornuur Sum, Tov Aimag</i>
<i>Project Implementation Agency:</i>	<i>ASM Association NGO</i>
<i>Project Executive Agency:</i>	<i>XAMO Company LTD, established by initiative of ASM</i>
<i>Project Co-Partners:</i>	<i>ASM Association NGO Bornuur Sum Citizen's Representative Khural MRPAM/SDC SAM Project Mongolian Cooperative Training & Information Center</i>
<i>Project Duration:</i>	<i>March 01, 2008 – March 01, 2013</i>
<i>Start Date:</i>	<i>March 01, 2008</i>
<i>Total Budget:</i>	<i>MNT 270,678,000, (US\$ 222,322.82)</i>
<i>Contribution by ASM:</i>	<i>MNT 151,878,000, (US\$ 124,745.79)</i>

Challenges:

- i) Mercury free technology was a completely new approach for the Mongolian primary artisanal miners.*
- ii) Some of the innovations were perceived as too simple to justify the expected performance. Miners would say, "this won't work we have tried it before," while presenting the plan.*
- iii) The miners expected state of the art equipment, resulting in some of the simpler techniques like the sluice, not being trusted to perform.*
- iv) A recovery equal to or higher than mercury amalgamation had to be achieved before the miners were convinced of the solution.*
- v) Half of the equipment for the pilot plant was purchased from outside Mongolia.*
- vi) The Holman shaking table, which separates the gold from other heavy minerals (effectively replacing amalgamation), is expensive and imported.*

- vii) *A radical approach had to be used to modify equipment from some of the trusted traditional usages, e.g., opening up the mills for open flow processing.*
- viii) *There was no opportunity to compare directly with mercury amalgamation as it had already been banned and its use would not be tolerated by either miners or authorities even for testing purposes.*
- ix) *Laboratory samples were analyzed at the Central Geological Laboratory and the turnaround time for results is about 1-2 months. The long waiting time before results could be analyzed meant that needed adjustments to the process were delayed.*
- x) *The mercury-free model still needs state inspection approval.*
- xi) *The plant was under a great deal of pressure to produce results after such a heavy investment.*

Opportunities:

- i) *There is a wealth of experienced personnel in Mongolia (artisanal miners and millers).*
- ii) *Half of the technology was purchased or fabricated locally and all the equipment has the potential to be produced locally.*
- iii) *The plant was built in cooperation with the local miners Xamo Pvt Ltd.*
- iv) *The miners had ore stacked in their homes from the time of the mill confiscation therefore access to test ores was never a problem.*
- v) *There was a willingness from the miners to experiment with their ore even with a risk of losing the gold during experimentation.*
- vi) *The miners participated in the building, testing, and commissioning of the pilot plant.*
- vii) *The model has been duplicated by the Bornuur Milling Company and is now serving around 80 miners a day from at least 6 Aimags, producing an average 250 grams daily valued at US\$ 7000.*

Source: Singo (2009)^{lxv}

In summary, when seeking to design effective pollution control legislation for ASGM the following points should be considered regarding the use of technology restrictions:

- Technology restrictions should be used to improve responsible economic activity and not to make the activity economically unviable. The use of technology restrictions can have the unintended consequence of pushing active economic sectors into financial infeasibility;
- Only prohibit extraction or processing processes when there are viable alternatives available. Forbidding the use of mercury, for example, without offering alternatives that have comparable efficiency, cost, ease of management, and technical sophistication requirements will, in reality, only result in illicit and unsafe use of the substance;
- Redirecting users to a specific technology (that is less damaging to the environment, for example) may be done but it is important that the relevant economic actors have the ability to purchase, build, and independently maintain that technology. (Note that access to credit can play a key factor here.) Promoting a model which is dependent on the financial support of government and international donors is, in the long run, not very realistic and can create a series of unhealthy dependencies;
- When redirecting the use of specific technologies it is always more successful and safer to redirect to a less sophisticated process, especially one that can be built with local materials. The ASGM sector has important lessons in this regard that need to be understood. For example, forbidding the use of mercury (which is a very low sophistication, easy access technology) can, in practical terms, be more socially problematic for local users than

- forbidding the use of cyanide (which involves greater skills and technological investment and sophistication);
- Any mandatory use of specific tools or machines (e.g., retorts) should be available in the local market or should be easy to build with local materials;
- Restrictions aimed at specific processes (e.g., a combination of cyanide and mercury in the processing of gold), techniques (e.g., storage of explosives), or machines should be described clearly in the regulations. A good example can be found in the Tanzanian environmental regulation which states that, “The holder of a Primary Mining Licence shall NOT heat mercury amalgam to recover the gold without using a retort.”

IV. ROLE OF INSTITUTIONAL ASPECTS IN FORMALIZATION AND LESSONS LEARNED

The important institutional dimension of ASM formalization is often underestimated and not well analyzed.

Awareness of the fundamental role of the State in public management of mineral resources should be sufficient to understand the relevance of state and government institutions in the process of formalization. This role is even more important when it is related to ASM because of the sector’s complexity, the many differences between it and the LSM sector, and the need for government support in different areas of the sector, as explained in the first section of this report.

Organizations and associations within the ASM sector receive a lot of attention in legal policy statements and in the literature as a key area for formalization. Nevertheless, it is in this area that misunderstandings prevent public policy from promoting ASM associations or organizations effectively.^{lxvi}

In a sector whose participants generally have low levels of education and technical knowledge, the role of the academy, and research and capacity-building centres is crucial for formalization. Unfortunately, the existing mining centres, mining engineering departments, or research institutes dedicated to the mining sector do not always address the ASM sector’s technical needs.

In the institutional realm, the particularities of national systems, corresponding government structures, and political and socio-cultural contexts should play an important role. However, it is one area in which are found similar challenges and gaps across all the case studies, making it possible to identify common lessons that may have applicability in multiple jurisdictions.

A. State Functions and Initiatives

i. Parliament

The role of Parliament or Congress in shaping the strategic vision of the public policy of the country is crucial for ASGM.

Mining Commissions at the parliamentary level in countries with a mineral tradition typically play an important role in defining the legal framework and the national mining policy of the country (e.g., Brazil, Peru, Chile, Ghana). Historically focused on large-scale mining, they are starting to play a similar role in the ASGM sector, with the growth of ASGM, and political pressure in areas of high concentration of ASGM activity.

Where this has happened, the impact has been positive at different levels, from creating a national profile of the sector, to more concrete outcomes. This, for example, was the case in Brazil in the mid-1980s, leading to the promulgation of a new legal framework for the “*Garimpeira* activity,” (Law 7809 in 1989). The Mining Commission and small-scale mining associations like USAGAL, which had the technical support of the Centre of Mineral Technology and the National Geology Association, were active participants.^{lxvii}

A similar process took place in Peru in early 2000 when the artisanal miners of the Sur Medio organized into a coordination committee, and with the involvement of the Energy and Mining Commission. The GAMA project was an important catalyst and facilitator in this initiative. The process culminated in the approval of Law 27561 in 2002.^{lxviii}

The active involvement of the mining commissions of Parliament or Congress in ASGM is important in terms of developing a legal framework; the participation of miners' organizations in this process, working with national deputies and senators, is also important. At this level, legal and technical support of the miners' organizations, to help them to participate in the discussions and debates of the drafting process, is also an aspect that needs to be taken into consideration.

These mining commissions can also serve to monitor the implementation of the legal framework with the view of improving it. As explained, the sector poses unique challenges for regulators. It is desirable that institutional mechanisms are created, distinct from monitoring for enforcement purposes, in order to assess implementation and incorporate the results into new legal acts that can be integrated into a complete and realistic framework for ASGM.

ii. Ministries of Mining and Environment or Corresponding Executive Mining Institutions

In most countries, mineral resources belong to the State, and the government, is responsible for defining the mining policy and the management of the use of such resources. The role is typically attributed to Mining Ministries or Mining State Secretaries or Mining and Geology Departments depending on factors such as the complexity of the government institutions in the country and the relative importance of the sector for the economy.

In some countries (e.g., Ecuador and Brazil), the Ministry defines the mining policy and an agency oversees the attribution and monitoring of mining titles, usually with administrative and financial

4 considerations for the role of government institutions and decentralization

- 1) Consider engaging a parliamentary mining commission on ASM public policy
- 2) The results of implementation of the public policy should be monitored. Consider creating a multistakeholder forum at the parliamentary level to address it
- 3) The situation of decentralization and capacity of the government institutions needs to be addressed with a clear strategy, this may include:
 - a) Multidimensional programs of capacity building for the government related to the ASGM sector
 - b) Participation of the miners' organizations and other stakeholders in development of policies or regulatory frameworks
 - c) Development of "smart regulations" in the sense that they do not constitute an administrative burden for the government institutions (e.g., in attribution of licences or titles; create simple but efficient, integrated and decentralized licensing systems)
 - d) Where possible a command and control approach (such as licensing system or enforcement system) should be substituted by economic instruments and community management approaches
 - f) Decentralization of the resources in terms of personal and financial resources. Economic incentives may be put in place to attract professionals to work with ASGM at local and provincial levels
 - g) Use royalties, fees, and penalties to create an ASGM fund for use in ASGM government programs
- 4) Consider promoting Extractive Industries Transparency Initiative (EITI) adapted to ASGM reality taking into consideration the priorities of the sector

autonomy. This institutional arrangement is intended to create more accountability and transparency and to allow for appropriate checks and balances in the process.

These mining ministries, or corresponding government institutions, traditionally have concentrated on large-scale mining and have ignored ASGM, or have viewed it as an illegal mining activity. Gradually and more recently, the approach is changing and it is now common to see government mining institutions assuming the role of public management of ASGM activities along with other mining activities (e.g., Tanzania, Zambia, Ecuador). In rare cases a special department/division is created to oversee ASM (e.g., Mongolia until 2009). This last option can have the advantage of developing internal government capacity around the sector and creating an internal government voice with the mission of promoting ASM activities which can bring the perspective of the sector to the government's internal mining debates.^{lxxix}

Of course, the coordination of policies (between the public management system created for medium and large-scale mining and for ASGM) is still a necessity, with the objective of generating an integrated public management system for mining in the country, as opposed to contradictory systems that promote conflicts or generate unfair competition between different systems and create obstacles to the growth or development of segments of the sector.

Another important government institution is the Environment Ministry, responsible for defining the environmental public policy and in most cases the management of the public pollution prevention and control system, or at least part of it (approval of assessments, attribution of mining permits, monitoring, and related activities).

Again, the coordination and integration of this system with a public mining management system is crucial but does not always happen. In some cases they have fundamentally different (even contradictory) approaches towards ASGM in terms of the role that the sector plays in the economy and the subsequent direction of public policy.

From an institutional and program delivery perspective, the issue of government decentralization seems a relevant aspect not only for ASGM, but also for the mining sector in general.^{lxx} The proximity of government services in ASGM areas of activity can improve understanding of the sector and foster a more realistic approach towards it.

It is interesting from a participatory observation point of view that the *local* governments often have a positive attitude towards ASGM (or at least a deeper understanding of the importance of working with the sector).^{lxxi} In contrast, the provincial and national government institutions tend to be removed from the realities of the phenomenon. This can lead to less well-informed evaluations or expectations about the sector (e.g., that it is a passing phenomenon though evidence suggests it will likely persist, or analyses that overlook local issues and underestimate interdependencies driving actions).^{lxxii}

Decentralization has been a public policy goal worldwide since the early 1980s.^{lxxiii} Several countries have initiated a decentralization process in the administration of mineral resources after decades of a centralized institutional culture for the attribution of titles, for public policy and regulatory development, and for technical support and technology development.

“Mining district posts, departments, or offices” at the provincial level, a phenomenon that existed in the 1960s and 1970s in several Latin American countries, (e.g., Brazil and Peru), functioned to direct administrative demands to a central administration but had no decision-making role for the attribution of mining licences or in defining public policy. Nevertheless, in some cases they played an enforcement role. In the countries where these regional units existed, they became a primary channel for the decentralization process.

Taking into account this centralized tradition, it is not surprising that the implementation of this approach has not been very successful for a number of reasons:

- 1) The technical and administrative capacities were and usually remain concentrated at the national level;
- 2) The implementation of decentralization often does not come with the necessary of financial resources;
- 3) Decentralization is a process that can be accelerated if the two issues above are addressed, but there is an institutional culture particular to the mining sector that will also need to change, which takes time. This institutional culture arises, in part, from the mining sector's treatment as a strategic economic sector (linked with security issues), characteristic of the post-WWII approach.

Lessons can be learned regarding decentralization of licences for ASGM from the interesting experiences of the Philippines and Madagascar.^{lxxiv}

In contrast to the administration of mining activities, the public environmental management system was created with decentralized competencies and structures but with a lack of resources for proper implementation.

The general lack of capacity of government mining and environmental institutions, aggravated by the additional role of public management required by the ASGM sector, affects the central administration as much as the provincial and local levels. There are three main reasons for this situation. The first is that the ASGM sector has many mining operations compared to large-scale mining. The second reason is that government usually is not prepared to deal with the specificities of the ASGM sector at the public policy level or technical level. And finally, the ASGM sector demands a level of support in several areas (from credit to health and safety) in which governments typically have limited capacity.

This situation needs to be addressed with a clear strategy if the government would like to fulfil its role of public management of the ASGM sector. This strategy may include:

- Multidimensional technical programs for the government related to the ASGM sector;
- Development of policies or a regulatory framework with participation of miners' organizations and other stakeholders who deal directly with the sector and are knowledgeable about it;
- Development of "smart regulations" that do not constitute an administrative burden for government institutions, in particular, in attribution of licences or titles;
- Creation of simple but efficient, integrated, and decentralized licensing systems;
- Where possible command and control approaches (such as a licensing system or enforcement system) should be replaced by economic instruments and a community management approach;
- Decentralization of the public management of ASGM to the provincial and local level;
- Decentralization of personal and financial resources. Economic incentives may be put in place to attract professionals to work with ASGM at the local and provincial levels;
- Use royalties, fees, and penalties to create an ASGM fund to support government ASGM programs.

Government enforcement is essential and its absence is one of the main causes of high levels of illegality in the ASGM sector. Nevertheless, non-enforcement by itself does not adequately explain the problem. In fact, if more emphasis were put solely on enforcement and penalizing illegal activities, the main result would be to generate more conflicts between ASGM and the government.

Enforcement is a tool for improving policies and programs and (in specific cases) can help eliminate the "bad apples." However, when the "bad apples" are the entire crop, different tools and instruments

should be put in place because it is clear that it is not a problem of enforcement but rather a deeper or different problem.

As a tool for ASGM improvements, it is possible to distinguish two different roles in this area. One is traditional enforcement and the other is a process of monitoring the implementation of the regulatory framework and policy measures. The second role, mentioned before, may be most effective when it is used as a feedback mechanism (or system) for improving regulatory implementation, distinct from enforcement and with participation of a multi-stakeholder reference group (for example at the Parliamentary level).

Traditional enforcement mechanisms may achieve better results when they include some of the following aspects:

- Timely implementation of incremental measures of prevention, education, and penalization. Avoid sending in the police when other resources (e.g., experts to talk with the people about the obstacles of legalization) would be more appropriate.
- Enforcement focused on more stable areas where the regulatory system is being adopted rather than trying to impose it in areas where such regulations are not yet working as a system of controls. In Peru, for example, legalization is successful in the small-scale mining subsector, but is failing in the artisanal mining subsector. In this case enforcement should apply to the first group but is not an effective approach for the second.
- Administrative and financial autonomy of the enforcement agency from the government institutions that manage mining titles or environmental licences is important in terms of checks and balances.
- Active involvement of communities in the enforcement process (not only technical inspectors).
- Administration and distribution of revenues from penalties should be handled by different agencies or institutions than those that handle the application of penalties.
- Application of revenues from penalties to projects in the region where the penalties occurred.^{lxxv}

The importance of monitoring (or accountability) for the development of the sector can be addressed in a variety of ways, including through voluntary initiatives. Extractive Industries Transparency Initiative (EITI), for example, is an international voluntary initiative to establish a global standard for financial transparency in oil, gas, and mining with funds of the EITI Multi-Donor Trust Fund managed by the World Bank. It is an effort to allow natural resources to benefit all. Created at the World Summit for Sustainable Development in Johannesburg in 2002 it is a coalition of governments, companies, and civil society but thus far it has concentrated on Large-Scale Mining.^{lxxvi}

The application of this initiative to ASGM is crucial. It can bring appropriate levels of transparency to all segments of the mining sector but it can also benefit ASGM in different ways. For example, the lack of basic official information about ASGM (including estimates of production, number of operations, volume of investment and number of people directly and indirectly engaged in the sector, total exports, economic contribution of the sector in rural areas, etc.) creates a real data void. It is a barrier for the government to developing appropriate formalization plans and programs, and for ASGM itself to being accepted by society as a legitimate segment of the mining sector. Additionally, without transparency in the ASGM sector it is difficult to achieve transparency in the larger mining industry because in some important mineral commodities these two sectors interact in terms of chain of custody (such as gold, diamonds, gems, etc).^{lxxvii}

The development of the initiative for ASGM should take into consideration its realities and capacities and examine the priorities for the sector while identifying what areas can bring transparency and associated benefits to the mining industry in general.^{lxxviii}

The analysis of this document focused on four government institutions (Ministry of Mining, Ministry of Environment, monitoring groups, and enforcement agencies) but that does not mean that other government organizations are not involved and have a role to play in ASGM, such as the Ministries of Health, Finance, Labour, etc.

As noted above, institutional interaction and coordination is the key for success but that only happens if there is a clear mandate for the Ministries to promote and manage the ASGM sector. The way to bring a clear mandate is through the Constitution or national public policies or plans such as a poverty reduction plan or the “Agenda 21” national implementation strategy.

Madagascar is an example of government including ASGM in the national poverty reduction plan. Similarly, Tanzania’s National Strategy for Growth and the Reduction of Poverty (NSGRP) of 2005 states:

Mining is one of the fastest growing economic sectors in Tanzania. In 2003, it grew by 17 per cent compared to 15 per cent in 2002. This growth was propelled by heavy investments in mineral exploration and production. Artisanal and small-scale mining is increasingly becoming dynamic as it provides alternative economic opportunities to the rural communities. There is a need to balance the livelihood requirement of artisanal miners with the economic objectives of the large-scale operators. Currently, backward and forward linkages are not strong enough for local value-addition and employment creation. Serious poverty concerns have been raised regarding the impacts on environment, tensions over land rights, and labour relations in areas where mining activities are being undertaken. The challenge ahead is to ensure that investments

8 considerations for the role of miners’ organizations, the academy, and research centres

- 1) The legal framework and other programs such as credit can play a role in changing socio-economic structures and relations and in creating the conditions for establishing healthy and fair economic relations between the different actors throughout the gold chain of custody
- 2) It is valuable to understand better the role of public policy in promoting a diverse ASM sector and in establishing healthy and fair economic relations among different actors
- 3) The participation of the miners’ organizations in the elaboration of the regulatory frameworks and national ASGM policies or programs is essential in terms of developing successful and realistic public policy
- 4) Nevertheless, it is also important that all categories are represented along with the different strata in each group where they exist
- 5) Organizations that protect interests are obviously voluntary but can be promoted through “bottom-up” projects or initiatives, such as some of the ethical certification initiatives
- 6) Incentivize universities to incorporate ASGM into the curricula of programs of mining engineering, geology, geosciences, law, sociology and anthropology, business, etc.
- 7) Promote mining research centres to create long-term ASGM interdisciplinary research programs with the objective of generating information and knowledge but also to develop capacity building
- 8) Create incentives for dedicated interdisciplinary capacity building centres to support the ASGM sector and legal clinics to help ASM to face its challenges. These centres and clinics should be located close to the main areas of ASGM activity. Long term financial support is crucial in these cases

benefit the wider economy by giving particular attention to disadvantaged regions.^{lxxix}

B. Role and Major Initiatives of Miners' Organizations

i. Clarification of Concepts

The role and function of miners' organizations is an area in which there are many misunderstandings. First there is confusion between associations or organizations established for defending or promoting the interests of the sector nationally or regionally and those associations or organizations that are focused on actual mineral extraction, processing, and production. Despite the important relationship between the two, they each have different roles to play in the institutionalization and formalization of ASGM.

Another misconception related to the production-focused organizations or associations is the belief that the ASGM miner is an individual worker without any connection to the individuals around him on the mining site, which is not an accurate description of the situation in ASGM areas. Also, there is a common belief that on the mining site everyone is a "miner" or a worker, and that across the sector there is only one category of labourer. This concept is a misrepresentation of the economics in an ASGM mining operation. These poorly understood structural issues are often reflected in a confused relationship between the mining legal framework and the socioeconomic relations that drive the sector.

At the mining sites there is a clear organization of labour and socio-economic hierarchy. There are the workers (who have different titles depending on the country or the role in the division of the work). There are the financial providers or "godfathers," who have capital and provide the equipment and tools. There are owners of transportation, food, material, and milling businesses, etc. In some cases these players are also holders of the mining title.^{lxxx}

It is important to note for ASGM, like other mining operations, that without clear organization of labour, it would be impossible to produce gold. It is also important to appreciate that different economic roles in ASGM are necessary to the functioning of the sector (e.g., not everyone has capital or entrepreneurial skills). Nevertheless, some economic relations are more horizontal, healthy, and fair than others and that is something that legal frameworks can help as much as some voluntary initiatives such as fair trade certification schemes.

In the 1980s and 1990s a series of socio-economic analyses of ASGM was developed with the objective of understanding the economic and structural power relations on the mining sites.^{lxxxi} These analyses generally lack a solid understanding of the chain of custody of gold and the relationship between the mining legal framework and the kinds of economic relations or economic models they promote.

It is crucial to point out that the regulatory framework can have an important role to play in the economic structure of ASGM and the business models employed. It can affect economic relations through the issuing of different types of mining titles with different rights attributions, and the obligations associated with them. It can be used to promote specific types of business entities that, in turn, will lead to different kinds of structures and relations (some more inclusive than others, such as cooperatives, *comandita* companies, or solo ownership companies) depending on the specific economic capacity of the actors and the decentralized or centralized economic structure involved (see the analysis above).

In summary, ASGM miners are indeed organized for the purposes of production and in that organization there are different kinds of socioeconomic relationships. Some of these are based on exploitation depending on the nature of the political and legal framework, which may ignore, enable, or support these relations inside or outside of the ASGM sector. The legal framework and other programs such as credit and certification have the potential to change these structures and relations

and to create the conditions for establishing healthy and fair economic relations between the different actors throughout the gold chain of custody.

At the beginning of this item, we clarified the difference between organizations for production and organizations for ASGM advocacy. It is also important to acknowledge that the way that the production organizations are organized has an impact on the kind of organizations that may be created to defend the interests of the different social strata.

ii. Syndicates and Other Miners' Organizations

From the case studies, it is possible to identify that, independent of the state of legalization or formalization of the sector, the miners organize themselves to defend their own interests.

A great part of the success in the development of regulatory frameworks comes from the organization of the miners, pointed out in the case studies of both Ecuador and Peru, and also demonstrated in Brazil (with USAGAL) in the 1980s. The majority of these organizations represent the “owners” of the mining operations or processing plants. Real cooperatives or partnerships (e.g., a *comandita* company) represent, and are directed by, the workers who are the actual owners of the cooperative.

As previously mentioned, there are several significant cases that are, in name and legal recognition, cooperatives, but do not function as equitable worker-run organizations. In practice they have the more traditional hierarchical structure of a company, but are registered as a cooperative to take advantage of legal requirements and/or program incentives (or the lack of other alternatives to choose from). In that case, the workers often do not participate in the decisions of the “cooperative”.

Finally there is the traditional union structure in which workers are organized to engage formally with management or owners. This structure is currently not common in ASGM. The absence of this kind of structure is not a surprise because of the relatively early stage of maturity of ASGM as an economic sector. This does not mean that it will not be more common in the future, particularly if the sector evolves through formalization and there are more initiatives that create economic incentives and also specifically address the need for some kind of workers' organization at the production level (e.g., Fairtrade and Fairmined standards).

In terms of understanding and engaging with private mining organizations, whose mission is advocating for the interests of the sector, it is important to acknowledge that:

- The sector is very complex and there are significantly different issues and interests among different categories of ASGM;
- Inside of each category, the sector is stratified. It is possible to identify at least two major groups: the workers and the “financial supporters of the operations,” or the holders of the mining titles and processing plants.

The participation of miners' organizations in the elaboration of the regulatory frameworks and national ASGM policies or programs is essential in terms of developing successful and realistic public policy instruments. Nevertheless, it is important that all categories are represented along with the different strata in each group, where they exist.

Organizations that protect interests are obviously voluntary and are a function of awareness, will, and capacity, which cannot be imposed but can be promoted through “bottom-up” projects, such as ethical certification initiatives. As was pointed out in the MMSD project, there is a real need for ASGM chambers and the role of such a chamber should be diverse to meet the needs of the sector, such as:^{lxxxii}

- *“To serve as a source of information and aid on all important issues related to the legal, fiscal, institutional and administrative framework of the sector, the access to foreign markets,*

the activities within the sector (comprising not only mining itself but as well the transformation, marketing and exporting of the products)

- *To serve as an agent to provide access to information and further qualification of the members (over the long term even the establishment of training centres could be considered)*
- *To lobby the government for the needs of the sector and to defend the interests of the members, i.e., proposing adaptations of the legal framework in order to deregulate the markets, facilitate exportation, etc.*
- *To help informal groups of miners to become formalized, to help the formal enterprises to compete with the informal and to more effectively control informal activities in the sector.*
- *To act as a promotional and image building agent for the relevant sector.”*

In Ecuador, for example, these chambers have become a reality. In some countries like Tanzania the mining association has created programs for ASGM.

C. Role of the Academy, Research and Technology Centres

i. Universities and Research Centres

The case studies illustrate that national universities and research centres were partners in international projects and, in specific cases, they have their own ASGM programs and initiatives, mainly in the technical and environmental area with some emphasis on socioeconomic issues. In most cases, these projects or initiatives involve the mining engineering and geology departments, or programs in collaboration with sociology or anthropology departments. Rarely was there participation of schools or departments of public policy or law in these initiatives.

As a consequence, some capacity building occurred in the countries where the projects were developed, but in general the programs did not continue over time and were not institutionalized through regular courses as part of undergraduate, graduate, or research programs.

Mineral technology research centres, geologic surveys institutes, and mineral laboratories were created mainly in the 1970s to deal with technical particularities of the mining sector in developing countries but these centres usually concentrated on large-scale mining issues. For a variety of reasons, in the 1980s and 1990s, these centres lost some of their importance and some of them were closed or, better, were able to redirect their activities towards other areas such as the environment. In rare cases they chose to incorporate ASGM as an area of work (e.g., Brazil's Centre of Mineral Technology – CETEM).

One challenge, however, is a lack of technical capacity in these centres which is problematic as the tendency has been to erroneously apply the same technology and use the same economic, social, technical, and public policy logic of large-scale mining to ASGM.

In a few countries, dedicated capacity building centres were created to support the ASGM sector mainly to deal with mercury issues but exceptionally, such as in Papua New Guinea and Zimbabwe, a more integrated approach was taken:

Small-Scale Mining Training Centre (SSMTC) – Papua New Guinea

Mineral Resources Authority (MRA) of Papua New Guinea, with funding assistance from the European Union established the Small-Scale Mining Training Centre (SSMTC) to build capacity for small-scale miners in the following areas:

- Technical know-how
- Understanding of legal framework
- Sudden influx of miners (e.g., in post-flood conditions)
- Occupational health and safety issues

- Mercury usage
- Business management skills
- Environmental (waste) management including other related areas such as:
 - Gender equality
 - Child labour
 - HIV/AIDS, and
 - Community development

SSMTC was established in 2009 and consists of 8 qualified trainers with different backgrounds and qualifications conducting trainings for about 11 modules. There are 4 levels of training and so far, SSMTC has trained participants in Levels 1 & 2 and to date, it has trained close to 800 participants.

Source: <http://ssmtc.wordpress.com/>

The Shamva Mining Centre Project – Zimbabwe

Shamva Mining Centre (SMC) was established in 1989 as a joint initiative between the Ministry of Mines of the Government of Zimbabwe, the Intermediate Technology Development Group (ITDG), the Small-scale Miners' Association of Zimbabwe (SSMAZ), and donors, including GTZ, the UK Department for International Development (DFID) and the EU. The objectives of the project were to:

- Provide a commercially viable and sustainable custom milling facility for small-scale gold miners in the Shamva area, and improve incomes of miners;
- To create jobs;
- To train miners in health, safety and sustainable mining methods;
- To share and disseminate lessons and experiences from the project locally and internationally. By 1995 the services provided had proved so effective and popular that more than 227 miners were regular users of the centre.

Project achievements

- Annual turnover of the centre steadily increased from about US\$ 50,000 in 1989 to US\$ 1.5 million by 1995.
- At the peak of its operations the centre provided secure and productive employment to 30 people consisting of 16 permanent and 14 casual employees.
- There was a significant increase in productivity at the mines. At the start of the project in 1989, average production of ore at small mines was 9 tons per day. By 1994 average production had increased to 57 tons of ore per day.
- Training was, and continues to be, provided to small-scale miners in mining methods, geology, mine pegging, environmental management, health and safety, business planning, and management.

Problems encountered

- By the early 1990s, it became evident that the capacity of the ball mill installed at the centre was not adequate to meet the growing needs of miners. As a result, miners had to wait between three to six weeks to have their ore processed.
- In an attempt to address this problem, the SSMAZ executive committee decided that a miner had to bring in at least ten tons to the centre before the ore could be processed. This arrangement effectively excluded the very small-scale miner from benefiting from the facility.
- The biggest problem encountered at SMC was the poor business decisions made by the SSMAZ executive committee concerning the operations of the centre.

By June 1999, the centre had run into serious cash flow problems. In January 2001 the committee decided to lease the centre to a local miner in Shamva. Since then, the centre has been operating but

below capacity and milling services provided are less efficient.

Lessons learned

- There is a need for development agencies to decide whether it is always necessary to hand over commercial projects to producers' associations such as SSMAZ. Great care has to be taken in working with associations to ensure that a few powerful people in the association do not reap the benefits for their own individual gain.
- Technology unlocks the potential of small-scale miners to run viable mines. Access to processing facilities at SMC enabled miners to increase productivity and improve the viability of their mines until management problems emerged in January 1999.
- Small-scale miners, like any other entrepreneurs, require a complete package of business development services to thrive and grow. In addition to technology, they require skills in business planning and management, mining methods, sustainable environmental management and access to credit and profitable markets.

Source: Dreschler, Bernd, 2001.^{lxxxiii}

These kinds of centres, regardless of the difficulties they may face, such as in Zimbabwe, are fundamental institutions that can have an important role in supporting miners in different areas of business development services but also in promoting capacity building for all relevant stakeholders.

Marginalization and exclusion are phenomena that result, in part, from the lack of capacity to deal with a situation and fear that originates in a lack of understanding of the issues and the options and solutions for change. These components clearly are present in many dealings with the ASGM sector. The best way to address this situation is through information, knowledge, and skills development. Some specific ideas for consideration include:

- Incentivize universities to incorporate ASGM as part of the regular program of the undergraduate and graduate courses in mining engineering, geology departments, geosciences, law schools, sociology and anthropology, business courses, etc. Graduating professionals will have acquired knowledge and a new vision of the sector;
- Promote mining research centres to create long-term ASGM interdisciplinary research programs with the objective of generating information and knowledge but also to develop capacity building through working with the sector;
- Offer incentives to create dedicated interdisciplinary capacity building centres to support the ASGM sector and legal clinics to assist ASGM with the legalization process. These centres and clinics should be located close to the main areas of ASGM activity. These dedicated ASGM centres also have the value of “institutionalizing” knowledge and creating the conditions that warrant continuity. Long-term financial support is crucial in these cases but with the potential to become self-sustaining in the medium-term, along with the evolution of the formalization process, because more miners' organizations will have the capacity (and the desire) to use and pay for the services.

V. ROLE OF ECONOMIC INSTRUMENTS IN FORMALIZATION AND LESSONS LEARNED

Mining regulatory frameworks traditionally rely heavily on command and control measures (CAC) such as licences, administrative requirements, and government enforcement processes.

Due to the complex social, political, and technical challenges associated with controlling the ASGM sector, it is important for regulators to combine these kinds of measures with economic instruments that can generate economic incentives for changing behaviours and practices.^{lxxxiv}

A general but key characteristic of ASGM that is important to take into consideration when applying economic instruments for behaviour change is its vulnerability to any increase in costs, a reality that particularly affects the poorest. The other side of the coin is that small economic measures can have a huge positive impact on these mining operations and it is possible, therefore, to transform them without great cost to the government.

This area of policy and law has not received much attention from governments, which tend to follow the large-scale mining recipe where CAC measures are easier to implement.^{lxxxv}

A. Fiscal Systems and their Role in the Gold Production Chain

i. *Taxation Regimes, Royalties, and Fees*

Until the 1980s some countries had special taxation regimes for mining, recognizing it as a strategic economic sector.^{lxxxvi} In the 1990s this approach changed and the mining sector began to be treated as just one more economic sector for tax purposes. The only exception is royalties, which is not a tax but a rent for the extraction of mineral resources.^{lxxxvii}

In terms of the ASGM sector, two tendencies have emerged. In some cases, Peru for example, it is treated as another economic sector with a few minor exceptions. In Peru the taxes for ASGM are the same as for the other economic sectors and are proportional to the economic capacity of the operations, however, royalties do not apply to artisanal or small-scale mining. In other cases, such as Mongolia, countries have distinguished the ASGM sector from other economic sectors and have used regimes similar to taxation of independent workers. There is a sense that the regular taxation for economic sectors is too complex for the ASGM sector.

Neither of these approaches is more correct than the other and, in seeking the most effective and fair approach, it may be appropriate to mix elements of both. The rationale for this approach is that the ASGM sector is comprised of small companies (owners of the mining title and the mining operation) and individuals (workers) and these two actors should be taxed differently. The approach should

10 considerations for the development of a fiscal regime (including taxes, royalties, and fees)

- 1) ASGM is an undercapitalized sector
- 2) Miners tend to have little access to capital
- 3) Taxation of companies/legal business entities is different than taxation of workers
- 4) ASGM needs a different fiscal regime than medium or large-scale mining
- 5) Different categories of ASGM (beyond the traditional small and artisanal scale) will allow for the creation of a framework that addresses the particular economic realities of various mining operations
- 6) All mining categories need to pay taxes, even if they are nominal
- 7) Different fiscal models can work for ASGM but all models should take into consideration the economic reality of the mining operation
- 8) Coordination between different government agencies should be achieved with the objective of having a balance in terms of cumulative fees applied for different administrative requirements
- 9) Stability of the fiscal regime is important for ASGM as much as for medium and large-scale mining
- 10) Regional harmonization of fiscal regimes should be considered as one means to prevent smuggling

More information and assessment should be provided to policy makers regarding the impact of fiscal regimes in the ASGM sector

account for the mobility of some workers in the sector.

The difficulties related to taxation of small business are not unique to the mining sector. The economic viability of these businesses can hinge on measures that respect their economic reality and simplify their requirements for compliance. Engaging small business efficiently is becoming of greater importance given that informality is a worldwide phenomenon growing annually in developing countries. According to the ILO and WTO report (2009) “levels of informality vary substantially across countries, ranging from as low as 30% in some Latin American countries to more than 80% in certain sub-Saharan African and South Asian countries. In most cases, informality has remained high and has even increased in some countries, particularly in Asia”.^{lxxxviii}

Royalties are a rent paid to the government in exchange for the private benefit of a mineral resource. In principle, mining resources are the property of the state because they are considered a common property of society that the government has the duty to manage (except in some countries like the USA where the owner of the land has property rights to the minerals, so in this case royalties are paid to the landowner).

Royalties in medium and large-scale mining can vary by the function of the type of mineral produced but not in terms of the size of the operation. In ASGM, the regulatory frameworks recognize the special characteristics of the sector and the current tendency is to have special rates as a function of the size of the operation and type of minerals extracted.

Royalties for the ASGM sector vary from 0.2% to 5% (Table 6). Those for artisanal mining tend to be exempted or reduced to a symbolic percentage (e.g., 0.2%). Recently, several countries have increased their royalties because of the rising price of gold. Bolivia, in the mining law of 2010 (draft), took an innovative approach to this problem by varying the royalty rate according to the market price of gold.

Another important discussion relates to the calculation of the royalty. There are three approaches: unit-based; value-based; and profit or income-based.^{lxxxix} The most common is value-based, which best reflects the nature of the royalty concept and more efficiently guarantees the payment of the royalty (prevents evasion). There are some mining economists^{xc} who defend an alternative approach – the profit or income-based royalty. One practical consequence of this modality is that it can provide space for evasion of royalty payment, especially if applied in countries in which there is not a strong capacity for taxation enforcement.

A mining licence fee is one of many administrative fees that the mining production organization incurs with the legalization of a mining project. Table 6 summarizes the cost of one (albeit essential) administrative licence in a number of countries. The amounts charged are inconsistent, running from US\$ 50- 350 annually for small-scale mining. The general tendency is to have lower fees for artisanal than for small-scale mining. In terms of follow-up it will be important to have more information about the fees and to assess the costs associated and the implications of these for mining organizations.

One crucial issue appears to be a need for regional harmonization, specifically related to fiscal regimes, including taxes, royalties and fees, among adjacent countries. These measures are some of the most important and effective regulatory tools to prevent smuggling.^{xcj}

ii. Selling Requirements and Taxes

The most common selling requirements in the mining sector are:

- The mining licensee has the right to sell the minerals extracted and processed without an additional licence, including for export. In the ASGM sector this approach is not generally followed and very often there is an additional licence and other administrative requirements in order to sell or export.

- When a commercial seller does not have a mining licence, such as in the case of a dealer, another form of licence or registration should be required to incorporate them into the system.
- In the case of gold, there is a requirement for a certified evaluation of the gold content by assay offices prior to selling. For the ASGM sector this can pose a challenge because the assay offices very often are in the capital cities, far from ASGM sites. Additionally, restrictions on quantities that can be evaluated can constitute a problem for ASGM.
- For example, in Mongolia the minimum quantity for evaluation is one kilogram. This creates security and cash flow obstacles which can prevent many ASGM mining operations (including legalized ones) from selling directly.
- These restrictions can become more problematic in cases where only the central bank can buy and export gold and pay less than the international market price.
- When the central bank does not have the monopoly of gold commercialization it typically imposes an export tax. Commonly, the tax is non-discriminatory, i.e., it does not differentiate ASM gold sources from other medium and large-scale sources. This kind of uniform tax “forces” the producers to not export directly because very often the tax is too high for ASGM.

Table 6: Royalties and Mining Licence Fees by Country

Country	ASGM Activities	Percentage of Royalty	Mining Licence Fees
Bolivia	SM	Was 7% Now is 1.5-2.5% depending if it is for internal sale or export	Not available
Brazil	ASM	0.2%	US\$ 62
DRC	AM	2.5%	US\$ 25
	SM	10% (includes all tax paid by ASM)	US\$ 195.40 for a small-scale exploitation permit
Ecuador	AM	Not applied	Not available
	SM	3% (new law)	Two minimum salaries (US\$ 528)
Ghana	ASM (first 3 years)	Not applied	Not available
	ASM (after 3 years)	3%	Not available
Guyana	AM	Not available	US\$ 5
	SM	5%	US\$ 50
Madagascar	ASM	2%	Not available
Mongolia	ASM	Not applied	Not applied
Peru	AM	Not applied	US\$ 0.50/ha annually
	SM	Not applied	US\$ 1.00/ha annually
Philippines	ASM	1.5%	Not available
Sierra Leone	AM	Not applied	Not available
	SM	5% royalty where market value is below US\$ 500,000; 3% royalty for all other minerals	US\$ 270 in 2005 US\$ 156 in 2007
Tanzania	ASM	Was 3%. Now 4%	US\$ 6.3 plus an annual rent of US\$ 63
Uganda	Location licence	Not applied	US\$ 340 one year licence or US\$ 450 2 year licence (investment below US\$ 5,000)
	Mining leases	3%	Not available

Sources: various sources – see reference^{xvii}

It is clear that this is an area that deserves more attention including studies to address the ASGM and related chain of custody issues. However, it is possible to conclude that:

- Commercialization licences as an instrument of control to identify the agents that commercialize gold are not an efficient mechanism to prevent smuggling.
- Public policy may be incentivizing ASGM mining operations to use as few intermediaries as possible (e.g., export the gold directly). This means, for example, that it may not make sense to impose additional licences to sell or export gold beyond the mining licence.
- As a principle, export taxes should only be used in the ASGM sector if they also apply to large-scale mining. In this case it is important to differentiate the rate based on the size of operations (e.g., based on categories of mining titles).
- Nevertheless, if a government decides to use export tax as an easy and reliable way to tax ASGM, it is important that the total ASGM taxes required is compatible with the size of mining operation (e.g., a reduction or even exemption in other taxes may need to be considered).
- Export taxes applied to gold buying shops or dealers should be harmonized with regional practices, in particular with those of bordering countries.
- Restrictions or administrative requirements that substantially increase the costs of ASGM operations for commercializing gold can lead to exploitation inside the ASGM sector (e.g., creation of organized crime and/or monopolies) and also be an incentive to smuggle to countries with fewer administrative requirements for selling and exporting.

9 considerations for selling requirements and aggregate value for ASGM:

- 1) Promotion of direct mineral sales by the mining licensees
- 2) Add the right to sell minerals to the mining licence
- 3) In the case of buyers that do not have mining titles (e.g., dealers) simplify the requirements to obtain licences for selling
- 4) Decentralize ability to attribute licensees
- 5) Simplify requirements for gold evaluation certified by the assay office
- 6) Consider harmonizing requirements with bordering countries
- 7) Some of the best ways to avoid smuggling through the use of economic incentives:
 - Use secure and financially sensible banking and market solutions rather than policing ones (be creative in this and the gold will pay for the potential additional costs)
 - Buy with a better price (central banks may pay for the gold at the international price or a little more if the objective is to channel the gold through central or national banks)
- 8) Adding value to the minerals is not an easy task in developing countries because it depends on the existence and size of a national market as well as cultural aspects in foreign markets. Clear policy based on economic incentives should incorporate these issues
- 9) Royalties are not an appropriate tax as they should only be applied in the production phase prior to value-added activities

- Economic incentives can be powerful instruments in the hands of government to prevent smuggling, especially for the ASGM sector. These incentives can include reduction of taxes and fees, limited time exemptions, incentives for the establishment of gold buying shops and assay offices in main ASGM areas, and using a small gold price premium to redirect the channels of commercialization of gold.
- Administrative requirements can be a problem for implementation not only for the mining operation, the miners, or gold chain of custody, but also for the government because dealing with ASGM (and related actors in the chain of custody) entails substantial numbers of transactions and clients.

iii. Tax Incentives to Add Value

The objective of promoting value-added activities in mineral production (e.g., refining or producing jewellery) is a longstanding one in the mineral policies of several developing countries.^{xciii}

It is not the objective of this paper to analyze the economic reasons for this phenomenon but it appears that the countries that have a greater chance of achieving this objective are the countries with national markets for the mineral product in question. This does not mean that countries without significant national markets for the specific mineral product (gold in this case) cannot achieve this objective, but it does mean that a clearer public policy (with active involvement and participation of the private sector) should be put in place to do so.^{xciv}

Furthermore, effective public policy can play an important role in countries that have a national market for the products in regard to the objectives of accelerating and expanding the market “building process”.

This is, once again, an area where economic incentives can play an important role, from specific credit lines with low interest to taxation incentives (exemption from some taxes for specified time periods).

In principle, because of the nature of the royalty concept, it should not apply to the value-added phase, however several regulations do include the royalty in the last phase of processing or refining, which can be a substantial disincentive to further value-added activities.

The area of public policy and adding value to mineral production deserves more attention and analysis as well as the contribution of economic incentives to this process.

B. The Role of Credit Mechanisms

Access to credit is one of the most important dimensions of formalization of the ASGM sector. Access to credit can stabilize the inherently cyclic activity of mining and allow more actors to gain the financial capability to become small title owners. This helps to build a more diverse sector and can help to create conditions for direct or indirect environmental and social improvements.

It is also a dimension with which there is very limited experience in the sector which poses some challenges. As much as it is possible to learn from other sectors’ experiences, the particularities of the ASGM sector must be respected (e.g., the level of investment in ASGM is very different than what is considered normal for most small businesses).

It is also important to learn lessons from the relatively few credit initiatives related to the ASM sector. The following are case studies of two countries illustrating experiences with credit mechanisms. The Zambian case study is not specific to ASGM but includes artisanal and small-scale emerald mining, which provides useful lessons for ASGM.

The experience of Tanzania and the suggestions put forward are interesting, however, it is worthy of note that the two last suggestions (buyer credit schemes and financing through cooperation between

ASM and LSM) have the potential to generate additional problems and to perpetuate dependencies and exploitation. Dealers and LSM are interesting and powerful parties and including them in schemes to finance ASM can run the risk of creating conflicts of interest. In this regard, the lessons from unsuccessful experiences with buyer credit schemes are worthy of further analysis.

Notwithstanding these challenges, ASM cooperation is possible between dealers and LSM and could be implemented with clear rights assigned to ASM players.

Lessons learned from experiences in Geita District, Tanzania

Tanzania has a clear policy regarding credit for ASGM but in large part it exists only on paper. Even so, Tanzania does have some interesting experiences with credit in the Geita District and the following recommendations are drawn from these and from other sectors with similar characteristics in terms of risk and mobility.

A Government Revolving Fund

The Government developed a fund through which miners can borrow money at low rates of interest. The fund should revolve in accordance with repayments made by individual borrowers. This approach, however, would require the Government's Geological Survey Department to take responsibility (as part of the extension services, for example) to carry out the evaluation of the applicant's lease area and provide a report to fund managers for decision making.

A revolving fund should avoid dealing with bigger loans that may prove difficult to repay, and instead focus on giving smaller loans directed to specific targets.

1. For small-scale miners, small loans could include the following:

(i) Mine development loan: This would target the development of a mine to bring it to a stage where mining can commence;

(ii) Processing plant set-up loan: This loan would enable the applicant to acquire, install, and commission equipment for processing of minerals;

(iii) Out of hand emergency loan: This is a loan that would enable the applicant to address any events that might occur that halt the project, e.g., floods, large rock falls, and other emergencies. Emergency loans need to be given cautiously and specifically; it is important that if the miner(s) is having more general difficulties these are not compounded by getting into debt.

2. For artisanal miners, group guarantee schemes are particularly appropriate. Actions could include the following:

(i) Equipment loan: This would target improvement to existing equipment;

(ii) Mine development loan: This would target the development of a mine to bring it to a stage where mining can commence;

(iii) Equipment hire-purchase schemes: These are arrangements that are set-up by establishing depots through which a pool of equipment that is used by artisanal and small scale miners is available for hire or purchase. Hiring rates should be set such that miners are encouraged to purchase the equipment.

Buyer Credit Schemes

This scheme was operated in Geita District and the surrounding areas by Meremeta, and allowed a gold dealer to provide assistance to miners through an agreement to buy the produced gold at a

price that will also enable him/her to recover the costs of the equipment. This scheme provided equipment like pumps, compressors, drills, etc.

The Meremeta programme collapsed due mainly to the poor quality service supplied to the miners, making the project unsustainable.

Financing Through Cooperation Between ASM and LSM

Although this approach has not been tried in Tanzania, the cooperation between small and large-scale miners has been used in other countries to assist small-scale mining projects.

NGOs and Financial Institutions Should be Encouraged to Set Up Schemes

Encouragement for these institutions to invest in the sub-sector can be achieved by provision of data that reflects the potential of the sector and its ability to contribute to poverty alleviation. A lack of data regarding the sub-sector, and negative perceptions associated with it, both contribute to the reluctance of institutions to invest in it.

Source: Mwaipopo et al. (2004).^{xcv}

Ndola Rural Emerald Restricted Area, Zambia

Most of the small-scale mine operators in the Ndola Rural Emerald Restricted Area suffer from a lack of financing. Most Zambian businesses, including the small-scale mine operators, cannot access bank loans without collateral. The cost of borrowing in Zambia is very high – interest rates hover around 25% to 30% – making it impractical for many small-scale mine operators to borrow.

There have been attempts to increase access to loans through the European Union Loanable funds. These loans are managed by the Mining Sector Diversification Programme (MSDP). However, even these funds continue to be inaccessible to small-scale miners because of the conditions attached. According to the Ministry of Finance (2006) only 3 million Euros have been accessed out of the 16.5M Euros that have been set aside – an access rate of under 20%. Between 2003 and 2005 only nine firms accessed the fund.

In an effort to increase accessibility, 1M Euros have been transferred from the MSDP to be managed by a microfinance institution. Under the new arrangement, it is expected that accessibility will improve.

Source: Lungu & Shikwe (2006)^{xcvi}

The Zambian case study illustrates a common situation in the ASM sector – a lack of credit mechanisms. It also shows that when an opportunity arises such as the *European Union Loanable Funds* which is open to entering the ASM sector the implementation is hindered by the imposition of bureaucratic requirements that cannot be met by ASM players. Hopefully the new arrangements are addressing some of these issues.

As noted above, using credit mechanisms as a tool needs further policy development and the few experiences that do exist provide valuable lessons. It is equally important to learn from other similar sectors. Attention should be given to what is considered similar because, for example, micro-credit or small credit in the mining sector is a very different order of magnitude than for many other types of small business.

The involvement of the national and international development banks in the creation of these credit and loan initiatives provides a positive signal for the private sector. As noted above, other private

initiatives may also be attempted but caution should be exercised so as not to promote exploitation and unhealthy dependence.

Direct financial support from the government to any particular initiative or mining operation may occur but care should be taken to not unfairly benefit any specific ASGM group/association, company or cooperative.^{xcvii}

It is also important to avoid using credit or loans as a “donation” or “gift”. The interest or the period of pay back needs to be appropriate to the ability to pay but providing capital for free can create distortions and dependencies that would be difficult to correct in the future.

One final important aspect that is crucial for any credit initiative is the link with a valid mining and environmental title. Without these basic legal instruments it is very difficult to establish any credit initiative. The mining and environmental titles may have different qualities (based on rights and obligations) but it is important that they have the basic qualities that can be used as a guarantee to obtain credit or loans.

C. Ethical Market Initiatives and Brief Analysis of the Current Major Initiatives

The global jewellery industry has become the focus of consumer concern that is leading to market demand for responsibly sourced products. Critics are pointing to the industry’s relation to the social and environmental impacts of the extraction of precious metals, diamonds, gems, and coloured stones. All of these commodities have been highlighted by a series of campaigns related to the conflict diamonds of West Africa as well as the *No Dirty Gold* and diamonds campaign led by Earthworks and Oxfam America.^{xcviii} The issue is being taken seriously by major retailers, including Birks, Cartier, Mayors, Tiffany & Co., WalMart, and others who have pledged to source from suppliers that can meet recognized performance standards on environmental and human rights.

i. Overview of the Initiatives

This international context creates an opportunity and very special momentum for ASM, particularly the sub-sector of precious metals, diamonds, gems, and coloured stones. Mining-specific ethical initiatives that directly or indirectly involve the ASGM sector include the following:

Fairtrade and Fairmined Gold

In 2003, the Alliance for Responsible Mining (ARM) started to develop a certification scheme for gold inspired by the idea of FairTrade. An interesting aspect of ARM is that the organization originated from the grassroots experience of Oro Verde (Green Gold). Oro Verde is a trade mark and an initiative for a certification scheme in the Chocó region in Colombia in the traditional territories of afro-Colombian communities.^{xcix}

Over several years, ARM developed standards with nine pilot projects in Peru, Ecuador, Colombia, and Bolivia. ARM also used the pilots to test the standards and improve them as they were simultaneously helping to build capacity and prepare the projects for certification. The standards were subject to a long process of regional and international consultation and are very comprehensive, covering diverse dimensions from environmental, legal, organizational, to social and work conditions.^c

At the beginning of 2010, ARM and the Fairtrade Labelling Organization (FLO) signed a partnership, consolidating the ongoing collaboration between the two organizations and simultaneously published the Fairtrade and Fairmined gold and associated precious metals standards. In early 2011, the dual-certified label “Fairtrade and Fairmined” was launched.^{ci} As of the summer of 2011 three organizations were certified (Cotapata, Condoto, and Sotrami) and others are undergoing the process of certification.

It is important to note that Fair Trade Certified™ products in 2010 topped US\$ 6.0 billion in global retail sales, providing benefits to more than 1.4 million farm families. Global retail sales are growing by more than 15% per year. Ethical certification of coffee production alone is expected to reach 25% of the total world production by 2015.^{cii}

The Fairtrade and Fairmined initiative is expanding to Africa and Asia, and is expected to cover at least 5% of the gold market (around 50% of ASGM gold production) in the next fifteen years.

It is clear that Fairtrade and Fairmined can become a real alternative for ASGM to enter the international market and change the lives of thousands of communities, gradually having a significant impact on the economies of the rural areas of the countries where the projects are developed. The initiative also shows that the ASGM sector can respond very well when it has an opportunity and that it is possible to work in sustainable initiatives when they are appropriately designed to address the particular needs and challenges of the sector.

Initiative for Responsible Mining Assurance (IRMA)^{ciii}

IRMA is a multi-sector effort that was launched in Vancouver, Canada, in 2006. Participants include mining companies, jewellery retailers, NGOs, and trade associations.

IRMA seeks to create an independent, third party assurance system to ensure that mines operate in an environmentally and socially responsible manner. IRMA is developing this system with input and support from all key sectors. The following principles underpin the IRMA system:

- Independent verification;
- Fair and equitable distribution of benefits to communities (including Tribes/First Nations and indigenous peoples) while respecting and protecting their rights;
- Effective responsiveness to potentially negative impacts to the environment, health, safety, and culture;
- Enhancement of shareholder value.

Currently, the initiative is engaged in the development of standards that cover human rights, environmental impacts, indigenous peoples, world heritage sites, and others. The primary target of the initiative is large-scale mining, but it also includes references to various aspects of relations and cooperation with ASM in its standards. IRMA is also in the process of developing a third party

7 considerations for ethical initiatives

1) There is a sense that ASM should have specific initiatives however initiatives dedicated to large scale mining can have some interface with ASM sector.

2) Certification mechanisms can be a powerful strategy, if they are used for the objectives for which they were designed (e.g., private sector actors using market force incentives)

3) There are significant experiences in certification in other economic sectors that can be very useful for the mining sector

4) It is important to evaluate the direct and indirect impacts of certification initiatives on the economic sectors and on the lives of people, especially the less advantaged such as many ASGM actors

5) Apply best practices (e.g., ISEAL) in the development of certification systems for the mining sector

6) The development of certification systems for ASGM is a process that is a longer term investment requiring many necessary adjustments

7) it is important to fully understand the lessons from the problems encountered by the Kimberly Process

verification process with the goal of being compliant with the ISEAL's *Code of Good Practice for Setting Social and Environmental Standards*^{civ} and designing a related governance model. The current goal is to complete the draft standards and assurance system design by the end of 2011 with piloting to occur in 2012 and public launch in 2013.

The Responsible Jewellery Council (RJC)

RJC is an international not-for-profit organization established in 2005 by a group of 14 organizations from a cross-section of the diamond and gold jewellery business. Since 2005, the Council's Membership has grown from 14 founding members to nearly 300 organizations. The RJC is governed by a Board of Directors. All Commercial Members are working towards achieving RJC Member Certification.

RJC is a membership organization and the requirements to become a member are the following:

- is actively involved for commercial reasons in the Diamond, Gold, and/or Platinum Metals Jewellery supply chain;
- is exempt from the role of consultant, advisor, or any other similar entity;
- commits to the prevailing RJC Principles and Code of Practices on business ethics, social, human rights, environmental performance, and management systems;
- commits to a Verification Assessment by an RJC Accredited Auditor within two years of joining; and,
- undertakes the payment of the annual RJC commercial membership fee.

Since 2005 RJC has evolved significantly. It began to accept third-party certification of member companies under its Code of Practice in early 2010. The chain of custody process for diamonds, gold, and platinum has been established with implementation expected in 2012.

Some key challenges that RJC is facing include:

- Very little NGO engagement in development of the standards and virtually no NGO support among leading mining activist organizations;
- No site-specific traceability, so no possibility of verification of compliance with standards linked to specific products;
- No consumer-facing ethical label.^{cv}

A discussion paper has been published recently by RJC that presents several options for chain of custody, which are under review in 2011.

Based on the history of RJC, it appears to be a system that has the potential to evolve to become a third party certification system with traceability in the chain of custody, providing a real alternative for certification for medium and large-scale mining. It will be important to follow the next phase of development around these two important issues. It is not clear what the role of RJC in the ASGM sector will be but important synergies potentially can be built between RJC and ASGM ethical initiatives such as Fairtrade and Fairmined.

The Dodd-Frank and Certified Trading Chains (CTC) in Africa's Great Lakes Region

The Dodd-Frank *Wall Street Reform and Consumer Protection Act*, promulgated in the United States in July 2010, mandates the Securities and Exchange Commission (SEC) to create rules that address potential conflict materials (tantalum, columbite, tungsten, wolframite, gold, and others, but not diamonds), to assess if these minerals from Democratic Republic of the Congo (DRC) or near the area are benefiting armed groups and if yes, to prevent their importation. The Secretary of State and the Administrator of USAID are responsible for developing a strategy to address this issue in the DRC.

This is a very new initiative to evaluate accurately but as of mid-2011 some of the concerns that have been raised about the Dodd-Frank Act are its compressed implementation time frame of 6 months, a top-down approach that may miss some important stakeholder input and adaptation and that it may not address some key underlying problems of conflict minerals, and therefore risks potentially generating unintended consequences particularly related to the ASGM sector. These concerns should be examined in more detail as the Act begins to be applied.

The Certified Trading Chains (CTC) pilot project was initiated in September 2008 and will be finished in June 2011. The project is an initiative of the Rwanda Geology and Mines Authority (OGMR) and the German Federal Institute for Geosciences and Natural Resources (BGR).

As explained in the report, “Implementing Certified Trading Chains (CTC) in Rwanda”:

The CTC pilot was initiated in response to calls from the United Nations Group of Experts on the Democratic Republic of the Congo, the International Conference of the Great Lakes, and the leaders of the G8 group of nations for a mineral certification system that would help resolve the problem of “conflict minerals” (tin, coltan, and tungsten ore as well as gold) in the Great Lakes Region of Central Africa.^{cv}

Three pilots are being put in place in Rwanda^{cvii} and a set of very basic principles and basic standards were developed. A first round of evaluation has been completed with an independent consultant. The consultant’s report indicates that the standards need further development, in particular to address the conditions of the ASGM sector.

The characteristics of the certification or assurance system for CTC are not yet clear but the preferred option appears to be third-party certification. Certification of minerals is a new area but good practices on certification, quality standards, and standards development is a well-developed area of expertise and this kind of initiative should apply these experiences.^{cviii} It is clear that the initiative is still in its early stages but that it has great potential to become a reality on the ground.

This initiative could have the potential to have significant positive synergies with the Dodd-Frank Act, particularly for large-scale mining, and with Fairtrade and Fairmined for ASGM. At this stage of the development of these issues, it is important to consider opportunities to build on existing work rather than to invest in duplication. A good overview of the existing initiatives in this area can be found in the Resolve report.^{cix}

ii. Lessons Learned from the Kimberly Certification Process

The Kimberly certification scheme was initiated in 2003 based on a UN General Assembly resolution,^{cx} that defines: “...the need to give urgent and careful consideration to devising effective and pragmatic measures to address the problem of conflict diamonds,” the elements of which would include the following principles and mechanisms.

Annex I sets out the broad terms and parameters of the initiative:

- (a) The creation and implementation of a simple and workable international certification scheme for rough diamonds;
- (b) Basing the scheme primarily on national certification schemes;
- (c) The need for national practices to meet internationally agreed minimum standards;
- (d) The aim of securing the widest possible participation;
- (e) The need for diamond processing, exporting and importing States to act in concert;
- (f) The need for appropriate arrangements to help to ensure compliance, acting with respect for the sovereignty of States;
- (g) The need for transparency.

Annex II sets out the specific elements of the certification system:

- (a) A Kimberley Process Certificate accompanies each shipment of rough diamonds on export;
- (b) The processes for issuing Certificates meet the minimum standards of the Kimberley Process as set out in Section IV;
- (c) Certificates meet the minimum requirements set out in Annex I. As long as these requirements are met, participants may at their discretion establish additional characteristics for their own Certificates, for example their form, additional data or security elements;
- (d) It notifies all other participants through the Chair of the features of its Certificate as specified in Annex I, for purposes of validation.

And Annex IV defines participant expectations for compliance:

- (a) Establish a system of internal controls designed to eliminate the presence of conflict diamonds from shipments of rough diamonds imported into and exported from its territory;
- (b) Designate an Importing and an Exporting Authority(ies);
- (c) Ensure that rough diamonds are imported and exported in tamper-resistant containers;
- (d) As required, amend or enact appropriate laws or regulations to implement and enforce the Certification Scheme and to maintain dissuasive and proportional penalties for transgressions;
- (e) Collect and maintain relevant official production, import and export data, and collate and exchange such data in accordance with the provisions of Section V.
- (f) When establishing a system of internal controls, take into account, where appropriate, the further options and recommendations for internal controls as elaborated in Annex II.

It also sets out “Principles of Industry Self-Regulation” stating that, “Participants understand that a voluntary system of industry self-regulation... will provide for a system of warranties underpinned through verification by independent auditors of individual companies and supported by internal penalties set by industry, which will help to facilitate the full traceability of rough diamond transactions by government authorities.”

As explained by international certification expert, Michael Conroy, the Kimberly Process (KP) has the following notable characteristics and inherent limitations:^{cxii}

- Provides assurance ONLY about supposed “conflict-free origin” of diamonds by requiring the exporting governments to “certify” that they have not come from a “conflict zone”
- Contains NO social or environmental requirements
- Contains NO assurance about human rights conditions
- Clumsy, slow intergovernmental process, with most decisions linked to international political considerations (e.g., Zimbabwe)
- Increasing evidence that it is easily evaded
- No consumer-facing label
- Weak traceability of products

In the analysis of Ian Smillie, one of the architects of the Kimberly system, the present crises surrounding Zimbabwe offer an opportunity to look for alternatives in terms of diamond certification. One is the Dodd-Frank initiative that could be extended to include diamonds. A second opportunity is that legislation, such as the Dodd-Frank Act, could be expanded to other countries, adding pressure to the movement for KP reform. A bill was recently presented in the Canadian Parliament, for example, on this subject.^{cxiii}

He also notes that the system has made a great contribution:

The very fact of the KP negotiations helped choke diamond supplies to rebel movements in Angola and Sierra Leone, and contributed to the end of hostilities. The KP has the best diamond database in the world. And the KPCS is credited by several countries with the

growth in legitimate diamond exports and thus of tax revenue. The Kimberley Process is discussed as a model for other extractive industries, and as a model of participation and communication between governments, industry and civil society, all of which play an active and meaningful role in its management.^{cxiii}

He provides his analysis of some of the key weaknesses in the system as follows:^{cxiv}

a) Design Problems: The truth is that national systems for regulating diamonds in most countries either did not exist or were wholly inadequate, and the emphasis on simple – with inexpensive as the sub-text – skewed discussions in the direction of simplistic approaches to internal controls and verification.

b) Internal Controls: Reviews by the KP and others of the internal controls in many participating countries, but especially those most affected by conflict diamonds, have found that internal controls remain weak to nonexistent.

c) Monitoring: Monitoring was virtually absent from the core agreement. A year after start-up, a peer review mechanism was agreed upon, and most countries in the KP have now had at least one review. The weakness or absence of internal controls in the countries most affected by conflict diamonds have gone more or less unheeded for seven years.

d) Sanctions: The Kimberley Process has no credible sanctions for “serious non-compliance” beyond suspension of membership or expulsion. The KP’s requirement for 100% consensus on all decisions has meant that no punitive action could be taken.

e) Membership Issues: The absence of some diamond producing countries from the Kimberley Process, and the active pursuit for membership by the KP of non-producing transit countries raises important questions about the costs and benefits of participation in the system.

f) The Cutting and Polishing Loophole: In addition to the KP’s many in-built lacunae, there is one that stands out: the failure to include the cutting and polishing industry in basic KP provisions. Essentially, illicit diamonds that bypass the early stages of the Kimberley Process can be laundered through willing companies in the cutting and polishing industry. Because the KP does not require participating governments to audit or reconcile intake and production in this sector, it remains a black hole through which all manner of illicit goods can be processed.

g) Transparency: The December 2000 Security Council Resolution endorsing the KP concept spoke of the “need for transparency”. In fact it took five years and lengthy debate before the KP would make public some of its trade and production data. All of the compliance reviews of KP countries remain confidential, as are discussions, debates and important outcomes within KP Intercessional and Annual Plenary Meetings. At the November 2010 KP Plenary, an Administrative Decision on confidentiality agreed that many of the documents that are now treated as secret may be placed on the public KP website unless a government explicitly disagrees.

h) Management: The Kimberley Process has no formal secretariat. Its chair rotates every year and its day-to-day business is conducted by working groups of participating countries, industry, and civil society. The membership is voluntary, some governments play a much larger role than others, with badly unbalanced burden-sharing for civil society and industry. The same is true of review teams. The KP has no capacity, financial or human, for independent research and investigation.

Given the problems it encountered and generated, it is difficult to accept that the Kimberly system offers an option for other minerals when it appears that the implementation of the system has generated so many problems. It is important, however, to say that the Kimberly process was a pioneer ethical initiative and therefore it is natural that it encountered challenges in its implementation. It also appears that some of the problems may be fixable but others, such as the subject of internal controls, may be structural. The entire system was built around the idea of internal control of the trade of

diamonds, which in fact does not exist and due to a wide range of factors is very difficult to implement using command and control measures (e.g., provision of tags/certificates or the effective control of the borders of participating countries).

The other problem is that the Kimberly process was created to offer “conflict-free origin” diamonds to the market but the system is weak in traceability. It is possible to conclude that the Kimberly Process did not create a certification process, but rather assumed that each government would create its own system nationally.

Despite these real challenges, it is both possible and desirable to have certifications in diamonds but one that is based on third-party certification of the producers and the diamond’s chain of custody; similar to a Fair Trade or Forest Stewardship Council model. The involvement of governments remains important, but in the role of creating the regulatory conditions for enabling the certification process rather than in the implementation of the certification process scheme itself.

An important question is whether the diamond sector is ready to undertake this challenge. At least part of the diamond sector appears to be ready and the consumer market is definitely indicating a readiness for diamonds, gold, and gems that can be demonstrated to have been produced respecting human rights, social, and environmental concerns. It is also clear that governments are interested in solutions, but one core lesson from Kimberley is that it is important to involve the government in initiatives that are compatible with a government’s role and capacity.

VI. CONCLUDING REMARKS

This report contains an analysis of past and current efforts in the challenging process of formalizing the ASGM sector, the objective being to examine lessons and make practical, and wherever possible, specific recommendations that will be useful for policy decision-making. Recommendations and conclusions are distributed throughout the report in the relevant subject sections, and are consolidated in Annex 1. Key observations and findings, reflecting on areas of priority for further study and action, are highlighted below.

As noted in the introduction, the objective of the report is not to provide a recipe for success for formalization but to initiate an informed conversation about ASGM issues and options. It has not attempted to isolate blame for any lack of success, as it is clear throughout the analysis that the levels and causes of informality are highly complex and interrelated.

This complexity is rooted in the characteristics of the sector, which are different from those of the traditional mining sector. These characteristics in part reside in the type of mineral deposits and specific minerals that ASGM extracts which allows for a simplification of exploration, exploitation, processing, transport, and commercialization activities. The direct consequence is that ASGM can be undertaken by almost anyone (who is willing to submit to heavy work in difficult conditions) with relatively low costs, minimal technology, and an immediate return on investment.

Based on these premises, a new approach to the sector and to formalization is examined: to consider ASGM as a legitimate economic sector that is a unique component of the national mining industry. The idea that ASGM is a subsistence sector that does not follow economic logic has not proved to be helpful and has, in practical terms, inhibited the sector and generated ambiguity about how public policy should approach it.

Environmental and social problems are an obvious reality in the ASGM sector, which are recognized in the report as necessary targets of policy and regulatory reforms. Importantly, these problems can be understood as symptoms of a lack of appropriate public policy rather than as intrinsic characteristics of the sector.

The research and analysis “unpacks” what could be considered to be realistic public policy, presents relevant lessons, and proposes recommendations regarding policy implementation for ASGM.

A fundamental lesson learned is that ASGM formalization is a multidimensional and multi-actor process that requires the integration of policies, strong coordination between institutions, and in some areas (in particular the area of tax regimes) harmonization of policies between countries. The participation of the relevant stakeholders (especially miners’ organizations) in public policy development also appears to be critical. Finally, a long-term vision for public policy with a stable legal framework (with ongoing refinements) is as much a necessity for ASGM as it is for large-scale mining.

The “heart” of realistic public policy in this sector is the recognition of different categories of ASGM, which allows for the simplification of legal and administrative requirements without compromising environmental and social standards. With distinct categories it becomes easier to define the corresponding mining and environmental licences with particular tenure and environmental and fiscal rights and obligations.

The rights and obligations of the mining tenure titles and relevant environmental licences (e.g., the duration of title, removal and transfer of rights, environmental instruments for impact evaluation and management, closure obligations, etc.) define the value of such titles in the market. These are the preconditions for any mining activity to have the necessary guarantees and provide motivation for economic stakeholders to invest in and do business with ASGM. If public policy does not contribute to these economic conditions it will continue to undermine and impede opportunities for economic and environmental sustainability.

The role of the State in controlling and managing ASGM involves interrelated elements including the attribution of licences, access to credit, addressing of gender issues, supporting technology transfer for a more environmentally advanced ASGM sector, etc. The physical and programmatic presence of the government near ASGM areas is crucial for this to occur and requires a long-term strategy based on a set of priorities informed by the participation of different stakeholders including the mining organizations.

Another approach suggested in the report to deal effectively with the fulfilment of the government role in ASGM is to combine traditional command and control measures with community management and economic instruments. This is an area that clearly deserves more in-depth analysis to determine how these approaches can be applied to ASGM.

Over the last 5 years, ethical market initiatives have gradually entered the mining sector with the potential to provide a great opportunity for ASGM, although many are still in early conceptual phases. At present, these initiatives tend to focus on the LSM sector or, when they do target ASGM, they often apply the same logic used in LSM, which for all the reasons noted above risk creating more problems than solutions. A notable exception is the Fairtrade and Fairmined Gold initiative that is exclusive to the ASGM sector and has passed the phase of initial development into implementation.

A final conclusion worth highlighting relates to capacity building, which is relevant to all players, including the miners, the government, the market, civil society, and the academy. A genuine knowledge exchange among different actors that will contribute to truly implementable solutions in this complex sector is highly desirable. Generating, disseminating, and institutionalizing this knowledge is a clear and important challenge in which the universities and research centres play key roles.

Despite or because of the complexity of ASGM outlined in this report, there is strong evidence that it deserves to be supported by effective public policy. Only with this support will it be possible to build a sector that can fulfil a potentially important role in poverty alleviation and contribute to the sustainability of our societies.

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- ^{iv} To obtain more information consult the Alliance for Responsible Mining website: <http://www.communitymining.org/> Disclaimer: Maria Laura Barreto is a member of the ARM Board of Directors.
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- ^{vii} The SAM project is an initiative of Swiss Development and Cooperation Agency (SDC) and the government of Mongolia, which started in 2005 and is currently in its third phase.
- ^{viii} A variety of technical and social factors point to ASGM as a long-term economic reality. Later in the document there will be a more detailed discussion of the geological factors that contribute to the long-term nature of this resource extraction activity.
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^{xcvii} For more information please see Mongolia case study.

^{xcviii} Earthworks is a nonprofit organization dedicated to protecting communities and the environment from the impacts of irresponsible mineral and energy development while seeking sustainable solutions. For more information please consult: <http://www.earthworksaaction.org>

Oxfam America is an international relief and development organization that creates lasting solutions to poverty, hunger, and injustice. Together with individuals and local groups in more than 90 countries, Oxfam saves lives, helps people overcome poverty, and fights for social justice. They are one of the 15 affiliates in the international confederation, Oxfam. <http://www.oxfamamerica.org>

^{xcix} Oro Verde website: http://www.greengold-oroverde.org/loved_gold/

^c For more information about the standards please consult <http://www.communitymining.org/>

^{ci} ARM website: <http://www.communitymining.org/ARM> and <http://www.fairtrade.org.uk/gold/>

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ANNEX 1: SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

Table 3.1: Conceptual Approach for ASGM

Table 3.2: Global Efforts Related to Mining Frameworks

Table 3.3: Environmental Legal Framework

Table 3.4: Institutional Aspects

Table 3.5: Economic Instruments

Table 3.1: Conceptual Approach for ASGM

Conceptual approach for ASGM	<ol style="list-style-type: none">1. A great part of the negative environmental and social impacts are related to marginalization of the ASGM sector from public policy or a lack of understanding of the ASM phenomenon that would allow for the building of a realistic legal framework and policies for ASGM2. ASGM is an economic sector – part of the national mining sector3. ASGM is here to stay because of the abundance of mineral deposits that allows for simplified extraction and the persistence of poverty and related social problems4. ASGM can be part of poverty alleviation strategies
How to approach formalization	<ol style="list-style-type: none">1. Formalization is a process of which legalization is one dimension2. Formalization of ASGM is a progressive, incremental, and long term process3. Formalization of ASGM has different dimensions such as environmental, social, legal, economic, technical, work conditions and health and security, finance and access to credit, gender, institutional and organizational, participatory local management, access to information, etc.4. Integration of different dimensions of public policy and coordination between different government agencies responsible for the development and implementation of public policy is fundamental5. Stability of the legal framework and continuity of programmes6. Ongoing improvement of public policies for ASGM (including the legal framework) based on lessons learned7. The engagement of the relevant stakeholders (especially the miners) in the process of elaboration and evaluation of such policies is crucial

Table 3.2: Global Efforts Related to Mining Frameworks

Mining framework	Conclusions	Recommendations
Definition and mining titles	<ul style="list-style-type: none"> •The objective of an ASGM definition in public policy is to be able to identify and distinguish it from other mining activities •Different mining titles for different categories of ASGM allows for responsible simplification of the administrative and technical procedures •Title holders are the ones ultimately responsible for the mining activities in the area 	<ul style="list-style-type: none"> •Any generic definition should proceed to a specific categorization of ASGM activities •It is important that the definition does not create any obstacle to the evolution and progress of the activity, which that means words like illegal, primitive or rudimentary should be avoided •Within each category there should be one mining title for all phases of the mining cycle •Commercialization and processing licences should only be required in cases where these are independent businesses from the extraction mining activities •There should be a requirement for people that work on the mining title area (e.g., labourers, operators, managers, etc.) to have written contractual relationships with the holder of the title
Mining title area	<ul style="list-style-type: none"> •The size of mining area should be treated as an instrument of public policy that can have positive or negative economic impacts on the operations, on the socio-economic stability of the people that work in the operations, and on the social fabric of the local community •Renewal of the title is a very important instrument for mining operations because it allows them to invest and continue work until the deposits are “exhausted” as well as for the government in its function to promote the best extraction of mineral resources •Reserves or dedicated areas for ASGM in most cases are very difficult to implement and are very costly and demanding for governments 	<ul style="list-style-type: none"> •The size of the mining area may be defined based on the categories of the mining titles, type of deposits, data about ASGM operation in the country and other land use factors in the country •In the case that the reserves or dedicated areas concept is used, incorporating the knowledge of the ASGM sector to help in the demarcation is essential •Communities with special territorial rights (e.g., black or indigenous communities) may have more chance to use reserves in a positive way. Participation of the community in the demarcation of the area is essential, as is the concept of exclusivity for ASGM to operate in the area

<p>Who can perform ASGM activities and transfer and upgrade mining titles</p>	<ul style="list-style-type: none"> •Restricting ASM mining titles to nationals may be an important aspect to consider in order to fully realize the role of the sector in poverty alleviation •Ability to choose different legal types of business entities is an important right that allows the economic actor to better organize the business in accordance of the their specific reality and also promotes economic association between people that would like to perform ASGM activity •Promoting partnerships (or associations) between mining operations is very important to a formalized and entrepreneurial sector •Transfer of mining rights and upgrade of mining titles are important instruments for improvement of ASM 	<ul style="list-style-type: none"> •Any restriction to foreign participation to ASGM should include foreign capital restriction and not only natural persons •The situation of foreign workers on ASGM should be evaluated carefully to not create unnecessary social problems •Allow diverse forms of business entities to be holders of artisanal and small scale mining titles •Partnerships (or associations) between mining operations should be incentivized through clear concrete measures: economic incentives, simplify legal requirements for legalization of partnerships and allowing different models of business type (e.g., consortium, joint venture, and old concepts like the “<i>comandita</i>” company) •Allow the transfer and upgrade of mining titles with the objective of creating the legal conditions for better managing the demands and opportunities for mining operations
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Table 3.3: Environmental Legal Framework

Environmental legal framework	Conclusions	Recommendations
Environmental Licences	<ul style="list-style-type: none"> • As for the mining regulatory framework it is crucial to have a dedicated environmental regulatory framework for ASGM • This dedicated framework has the aim of creating the conditions for both environmental protection and economic development of the ASGM sector 	<ul style="list-style-type: none"> • Evaluation of the impacts should be required for all categories of ASGM and specific guidelines on how to address them should be provided • The environmental instruments such as ELA, management plans and requirements for attribution of environmental licences should take into consideration the different dimensions of the mining project • Simplification of environmental requirements without reducing the environmental controls (e.g., one title that combines the environmental licence and management plan), is valuable for the mining operations but also for the government in dealing with its capacity to meet the regulatory demands
Mercury and other legal pollution control measures	<ul style="list-style-type: none"> • Limitation on technical capacities of the ASGM operations suggest that environmental regulation should be both prescriptive and descriptive - a combination of a legal instrument, guidelines and education material • ASGM mining in river beds has serious environmental impacts that should address through specific prevention and mitigation provisions mining and environmental framework • Buying, using and storing explosives in the context of ASGM is a critical issue that must be addressed by the regulatory framework • Consultation and mining closure are relatively new areas for mining sector but should be part of the legal framework of ASGM sector but in accordance of ASGM reality • Corporate social responsibility (CSR) is a reality in some segments of ASGM and public policy should address this potential 	<ul style="list-style-type: none"> • The technical knowledge about use of mercury and cyanide should be translated into regulatory guidelines that apply to the ASGM context • Further research should be done to identify the best way to legal address mining in river beds • Explosives storage regulatory measures should be adapted to the reality of ASGM • Capacity building in mercury and cyanide use and storage of explosives (including in construction for storage) are part of a successful implementation of any regulatory measures in these areas • Comprehensive regulatory guidelines should be provided in consultation and mining closure based on different categories of mining titles • Research should be done in terms of the approach on CSR that fits ASGM relationships and realities

Restrictions on Technology Use	<ul style="list-style-type: none"> • Legal restriction on the use of a technology, method, or process can create unintended impacts in the sector (e.g., “forcing” a move to a technology that causes more damage than the forbidden technology) • Technology restrictions can be used to improve responsible economic activity and should not make the activity economically unviable • Promoting a model which is dependent on the financial support of government and international cooperation is, in the long run not very realistic and can create a series of unhealthy dependencies 	<ul style="list-style-type: none"> • Any legal technological restriction should have available replacements in terms of the performance, cost, availability and technical complexity of use • Redirecting users to a specific technology (that is less damaging to the environment for example) may be done but is important that the relevant economic actors have the ability to purchase, build and independently maintain that technology • When redirecting the use of specific technologies it is always more successfully and safe to redirect to a less technical sophisticated process • Restrictions aimed at specific processes, techniques or machines should be described very clearly and specifically in the regulations
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Table 3.4: Institutional Aspects

Institutional Aspects	Conclusions	Recommendations
<p>State Functions</p>	<ul style="list-style-type: none"> •Parliament can play an important role not only in the development of ASGM framework but also in creating the conditions for the monitoring of the improvement of such framework •There are different Ministries that deal with ASGM issues in term of define public policy for the sector. Integration of public policy and coordination between these institutions is crucial •Decentralization is a desirable objective that can improve the public management of the sector. Nevertheless, the process is facing challenges of: <ul style="list-style-type: none"> a) The technical and administrative capacities usually remain concentrated at the national level b) The implementation of decentralization often does not come with the necessary decentralization of financial resources c) There is also a centralized institutional culture particular to the mining sector that will also need to change, which takes time. This institutional culture arises, in part, from mining sector's treatment as a strategic economic sector (link with security issues), characteristic from the second post-war approach d) The lack of capacity of the mining and environmental government institutions tend to be aggravated by the additional demands of public management of the ASGM sector and this affects the central administration as much as the provincial and local levels 	<ul style="list-style-type: none"> •Consider engaging a parliamentary mining commission on ASGM public policy •The results of implementation of the public policy (and regulatory framework) should be monitored. Consider creating a multistakeholder forum at the parliamentary level to address this •The situation of decentralization and capacity of the government institutions needs to be addressed with a clear strategy if the government would like to play and effective role in public management of the ASGM sector, this may include: <ul style="list-style-type: none"> a) Multidimensional programs of capacity building for the government related with ASGM sector b) Development of policies or a regulatory framework with participation of the miners organizations and others stakeholders that directly deals with the sector and has a knowledge of it c) Development of "smart regulations" in the sense that they do not constitute an administrative burden for the government institutions in particular in attribution of licences or titles; create simple but efficient, integrated and decentralized licence systems d) Where possible a command and control approach (such as licence system or enforcement system) should be substituted by economic instruments and a community management approach e) Decentralization the public management of ASGM to provincial and local level

	<ul style="list-style-type: none"> • The question of sector monitoring (or accountability) and its importance for the development of the sector can be addressed in a variety of ways, including through international initiatives such as the Extractive Industries Transparency Initiative (EITI) 	<p>f) Decentralization of the resources in terms of personal and financial resources. Economic incentives may put in place to attract professionals to work with ASGM at local and provincial levels. Use the royalties, fees and penalties to create an ASGM fund to use in the ASGM government programs</p> <p>g) Consider promoting Extractive Industries Transparency Initiative (EITI) but that should be adapted to ASM reality and take into consideration the priorities of the sector</p>
Role of Miners' Organizations	<ul style="list-style-type: none"> • Understand the differences between organizations for production and organizations for ASM advocacy • ASGM miners are indeed organized for the purposes of production and in that organization there are different kinds of socio-economic relationships • In terms of understanding and engaging with private mining organizations, whose mission is advocating for the interests of the sector, it is important to acknowledge that: <ul style="list-style-type: none"> a) The sector is very complex and there are significantly different issues and interests among different categories of ASGM b) Inside of each category, the sector is stratified. It is possible to identify at least two major groups: the workers and the "financial supporters of the operations" or the holders of the mining titles and processing plants 	<ul style="list-style-type: none"> • The legal framework and other programs such as credit or even private programs may play a role to change these socio-economic structures and relations and to create the conditions for establishing healthy and fair economic relations between the different actors throughout the gold chain of custody • It is valuable to better understand the role of public policy in promote a diverse ASM sector and in establishing healthy and fair economic relations among different actors • The participation of the miners' organizations in the elaboration of the regulatory frameworks, national ASGM policies or programs is essential in terms of developing successful and realistic public policy • Nevertheless, it is also important that all categories are represented along with the different strata in each group where they exist • Organizations that protect interests are obviously voluntary and are a function of awareness, will and capacity, which cannot be imposed but can be promoted through "bottom-up" projects or initiatives, such as some of the ethical certification initiatives

Role of Academy, Research and Technology Centres	<ul style="list-style-type: none"> •Marginalization and exclusion are a phenomenon that results, in part, due to the lack of capacity to deal with the situation and the fear that comes from a lack of understanding of the issues and real options and solution for change. These components are related and are very clearly present in many dealings with ASGM sector •In a very few countries, dedicated capacity building centres have been created to support the ASGM sector mainly to deal with mercury issues but exceptionally with a more integrated approach was take 	<ul style="list-style-type: none"> •Incentivize universities to incorporate ASM as part of the regular program of the undergraduate and graduate courses in mining engineering, geology departments, geosciences, law schools, sociology and anthropology, business courses, etc. •Promote mining research centres to create long-term ASGM interdisciplinary research programs with objective of generating information and knowledge but also to develop capacity building through work with the sector •Create Incentives for dedicated interdisciplinary capacity building centres to support the ASM sector and legal clinics to help to ASM to face their challenges in terms of legalization. These centres and clinics should be located close to the main areas of ASGM activity. Long term financial support is crucial in these cases
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Table 3.5: Economic instruments

Economic instruments	Conclusions	Recommendations
Fiscal systems and fees regimes	<ul style="list-style-type: none"> • In the creation of a regulatory framework for fiscal regimes (including taxes, royalties and fees) for ASGM, it is important to take into consideration the following factors: <ol style="list-style-type: none"> a) Understanding that ASGM is an undercapitalized sector b) ASGM needs a different fiscal regime than medium or large-scale mining c) Different categories of ASGM (beyond the traditional small and artisanal scale) will allow for the creation of a framework that addresses the particular economic realities of various mining operations d) Taxation of companies/legal business entities is different than taxation of workers e) Stability of the fiscal regime is important for ASGM as much as for medium and large-scale mining 	<ul style="list-style-type: none"> • It is important for all categories to pay taxes, even if it is only symbolic • Different fiscal models can work for ASGM but all models should take into consideration the economic reality of the mining operations based on previous defined categories • Coordination between different government agencies should have a balance in terms of cumulative fees applied for different administrative requirements • Regional harmonization of fiscal regimes (particular royalties and gold export tax) should be considered as one means to prevent smuggling • More information and assessment should be provided to policy makers in terms of the impacts of fiscal regimes in the ASGM sector
Selling requirements and minerals aggregate value/Credit Mechanisms	<ul style="list-style-type: none"> • Some of the best ways to avoid smuggling through the use of economic incentives include: <ul style="list-style-type: none"> • Using secure and financially sensible banking and market solutions rather than policing ones (be creative in the such measures and the gold will pay for the potential additional costs); • Purchase gold with a small premium to attract sellers • Selling licences allows for the control about who is selling legally but does not prevent smuggling • Adding value to gold is not an easy goal in developing countries because they depend on the existence and size of a national market as well as the behaviour of foreign markets including diverse regional cultural aspects that affect demands. 	<ul style="list-style-type: none"> • Promotion of direct mineral sales by the mining licensees • Use the mining licence as part of the right to sell minerals • In the case of buyers that do not have mining titles (e.g., dealers) simplify the requirements to obtain licences for selling based on volume of selling • Decentralization (at least at provincial level) of the attribution of licensee • Avoid imposing unnecessary requirements (e.g., minimum volume) in gold evaluation certified by the assay office • Consider harmonizing requirements with bordering countries • Value-added policies in developing countries require a combination of economic incentives, private sector partnerships and market development programs • Royalties should only be applied in the production phase prior to value-added activities, if the objective is to promote value-added

Ethical Market initiatives	<ul style="list-style-type: none"> • A series of initiatives are recently emerging in the mining sector but only a few deal with ASGM issues. • There is a sense that ASM should have specific initiatives however initiatives dedicated to large scale mining can have some interface with ASM sector. This can be a direct interfaces (e.g., standards related to how LSM deals with ASM sector) or indirectly (e.g., initiatives that deal with traceable chains of custody that may exclude the ASGM sector from entering the national and international market • Certification mechanisms can be a powerful strategy, if they are used for the objective that were designed (i.e. the differentiation between private sector actors using market force incentives) • There are significant experiences in certification in other economic sectors that can be very useful for the mining sector. • The present crises of Kimberly Process may indicate that there are conceptual and structural problems in the KP system rather than any inherent flaws in the application of certification to the mining sector. 	<ul style="list-style-type: none"> • It is important to evaluate the direct and indirect impacts of certification initiatives on the economic sectors and on the life of people especially the less advantaged such as many ASGM actors • Apply best practices (e.g., ISEAL) in the development of certification systems for the mining sector • The development of certification systems for ASGM is a process that is a longer term investment that require a lot of necessary adjustments • It is important to learn the right lessons from the problems of the Kimberly Process
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