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IGF CASE STUDY

# Transforming Artisanal and Small-Scale Gold Mining

## Progress in formalization of the sector

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# 1.0 Introduction

Artisanal and small-scale gold mining (ASGM) contributes an estimated 15–20% of global gold production annually, valued at approximately USD 38–46 billion at today's gold price, and supports the livelihoods of just under 20 million miners, including an estimated 4 to 5 million women and children, across 70 countries (World Gold Council, 2020; Von Stackelberg et al., 2021; World Bank, 2020, 2024; United Nations Environment Programme [UNEP], n.d.). Despite its economic significance, ASGM remains largely informal, meaning many miners operate outside legal frameworks, lacking access to formal markets, financial services, and environmental and labour protections. A recent report published by SwissAid (2024) on ASGM in Africa, estimates that each year approximately 321to 474 metric tonnes of African ASGM production flows through informal channels. This represents a value worth between USD 23.7 billion to 35 billion, or in 2022, between 72% to 80% of the total ASGM production on the African continent. Similar estimates for South America are yet to be published, nonetheless, ASGM most likely contributes to a significant share of Latin America gold output. Informality also contributes to unsustainable practices, including the sector's role in 35% of all mercury released into nature, posing severe environmental and health risks (UNEP, 2018).

Formalization aims to integrate ASGM into the legal economy through regulations, permitting, access to financial, and technical support. In key producing regions, such as Africa, Latin America, and Southeast Asia, governments and stakeholders have attempted formalization efforts, but challenges persist due to complex bureaucracy, high costs and stringent conditions for permitting and licensing, inadequate or perverse incentives, enforcement gaps, and lack of resources of agencies mandated to implement formalization. Creating a new impetus for formalization requires realigning incentives, reducing barriers, and promoting responsible mining practices to ensure both sustainability and economic viability in the ASGM sector.

Recent initiatives, such as the World Gold Council's Responsible Gold Mining Principles, which promote responsible sourcing and market access for gold produced in ASGM operations, and the World Bank Group's support for formalization programs, which provides technical assistance, financing, and policy guidance to governments, underscore the urgent need for ASGM formalization (World Gold Council, 2019; World Bank, 2024). The Artisanal Gold Council has also been instrumental in advancing mercury-free technologies, implementing on-the-ground formalization projects, and supporting responsible ASGM practices in key jurisdictions (Artisanal Gold Council, n.d.).

Over time, best practices and global standards have emerged to promote responsible ASGM. The Minamata Convention on Mercury targets mercury reduction in gold processing (Minamata Convention on Mercury, 2024), while the Organisation for Economic Co-operation and Development's (OECD) *Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas* (OECD, 2016) and the European Union Conflict Minerals

Regulation aim to ensure ethical sourcing (EU, 2017). The Code of Risk-mitigation for artisanal and small-scale mining engaging in Formal Trade (CRAFT) standard provides a progressive pathway for ASGM to enter legal supply chains while improving social, environmental, and labour conditions (Alliance for Responsible Mining and RESOLVE, 2024). Similarly, the Responsible Minerals Initiative supports due diligence and traceability programs, helping buyers to source ASGM gold responsibly (Responsible Minerals Initiative, n.d.). These frameworks provide a roadmap for responsible ASGM formalization, ensuring environmental sustainability, human rights protections, and improved livelihoods for miners.

This case study paper reviews key components of ASGM formalization, examines progress in the formalization of the ASGM sector in Tanzania and Ecuador, and draws some conclusions based on the case studies presented.

# 2.0 Key Components of Formalization of ASM

The main goal of ASM formalization is to transform the sector into a more responsible, productive, and legally recognized industry, ensuring greater social and environmental sustainability while improving the livelihoods of the millions of people involved. These aims align with the United Nations (UN) Sustainable Development Goals 1, 3, 8, 12, 14, 15, and 16 (UN, 2015).

Formalization should be seen as an ongoing process rather than an "isolated" occurrence. Key components of the ASM formalization process should include (IGF, 2017a):

- **consultations**: engage key stakeholders consisting of miners, asm communities and community leaders, government agencies, and non-governmental organizations,
- **legal and regulatory framework**: inclusive, clear, and transparent licensing and permitting process, and responsible environmental management,
- **technical support and capacity-building**: skills improvement to enhance productivity, safety, and efficiency,
- **best practices**: commit to best mining and processing practices and to responsible occupational health and safety standards,
- **incentives**: commit to encourage best practices and regulatory compliance through clear economic, technical, environment, and social incentives,
- **access to finance and markets**: facilitate asm miners' access to fair markets, financing, and value-added opportunities to improve incomes and livelihoods,
- **transparency and governance**: strengthen oversight mechanisms that allows a "plan-do-check-act" process to take place to improve continuously,
- **monitoring and enforcement**: strengthen oversight mechanisms to combat illegal mining, corruption, and illicit trade while ensuring fair resource management, and
- **transparent grievance mechanisms**: establish mechanisms for dispute resolution and collaboration between asm and large-scale mining (lsm) operations, as well between ASM miners and government agencies.

An ASM policy should focus on the local context and continually consider the most practical and feasible ways to achieve ASM-related sustainable development objectives. The initial step in developing an ASM policy is to analyze the context of the operations and engage and consult all relevant stakeholders before and during the formulation of the legal and regulatory framework. The framework should cover all phases of the mining life cycle, from prospecting, mining and extraction, processing, and trading through mine closure (IGF, 2024). The standards set for mining, processing, trading, and mine-closure should be in line with best practices and best

available techniques in a given context. Transparency in options for access to finance and fair markets should be part of the overall policy to prevent smuggling and illicit trade (e.g., national purchasing programs with central banks at prices that align with international markets and a premium price for miners fulfilling all their legal obligations). Government authorities should ensure that monitoring of compliance, enforcement, auditing, and review is effective, to give room for improvement overtime. Establishing a strong ASM policy is a gradual process. The next section outlines key components based on international best practices and regional experiences.

More information on broader ASM policies, which can be adapted for ASGM[1], can be found in the Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development (IGF) *Guidance for Governments: Managing artisanal and small-scale mining* (IGF 2017a), *Global Trends in Artisanal and Small-Scale Mining (ASM): A review of key numbers and issues* (IGF, 2017b), and *Modernizing Artisanal and Small-Scale Mining: Harnessing new technologies for sustainable development* (IGF, 2024).

## Consultations

Consultations involve engaging key stakeholders, including miners, ASM communities (especially vulnerable groups, such as women and children), community leaders, government agencies, and non-governmental organizations, to ensure inclusive and effective policy development. Meaningful dialogue with these groups helps address real challenges, create fair and enforceable regulations, and promote sustainable practices. Collaboration among stakeholders strengthens the legal and regulatory framework, and ensures policies align with the sector's needs. Continued consultation is not just a procedural step—it is the foundation of trust, ensuring that miners, communities, leaders, and government agencies co-create solutions that are transparent, inclusive, and sustainable. An effective ASGM formalization process is one that is not solely based on coercion. The IGF guidance document for ASM provide various strategies to maximize likelihood of successful consultation (IGF, 2017a).

## Legal and Regulatory Framework

A well-designed regulatory framework for the ASM sector must strike a delicate balance—strong enough to ensure accountability, environmental protection, and fair labour conditions, yet flexible and inclusive enough to encourage formalization rather than pushing miners into illegality. The framework should clearly and transparently outline the steps for licensing and permitting. It should define distinct categories within ASM, differentiating between artisanal mining (low-tech and labour-intensive) and small-scale mining (often semi-mechanized with higher production capacity). If necessary, or depending on the context within a specific jurisdiction, intermediary categories may be established. The criteria for categorization may

[1] In the following section, unless otherwise stated, ASM will allude to the ASGM sub-sector.

include amongst other factors permit size, production volume limitations, constraints on excavation depth, level of mechanisation (with clear guidelines of what it means), permit duration, and royalty structures, to ensure that they are tailored to ASM rather than mirroring LSM regulations. A well-structured framework should provide legal recognition, establish responsible

**Box 1. Economic incentives**

**Targeted tax incentives:** (a) lower tax burden or simplified tax rates to make compliance attractive; (b) temporary tax relief for newly formalized ASM businesses to facilitate transition; (c) a tiered tax system based on production levels, preventing excessive pressure on smaller-sized mines.

**Reduced import duties and VAT**: (a) exemption or reduction of duties on mining equipment and VAT to encourage small miners to formalize and upgrade operations; (b) other incentives for sustainable practices, such as tax credits or subsidies on low-impact processing methods or mercury free technologies.

**Dedicated formalization support and fees reduction**: lower licensing costs to reduce barriers to entry; subsidies on occupational health and safety equipment; grants for training.

environmental management guidelines, and define operational standards that integrate ASM into the formal economy while minimizing negative social and environmental impacts.

The legal and regulatory framework should address the sector's needs, based on specific context and realities rather than being shaped by idealistic, impractical standards. Regulations must be realistic, enforceable, and adaptable, to ensure effective governance without stifling miners with unattainable requirements. There should be room for continuous improvement, setting achievable targets that progressively guide miners into the formal system, to encourage long-term sustainability and compliance.

## Technical Support and Capacity-Building, and Best Practices

Technical support and capacity-building are essential for improving productivity and efficiency in the ASGM sector. Training should focus on skills development, health and safety, access to appropriate technologies, and best practices in mining, processing, trading, environmental management, land rehabilitation, and mine closure. Support can be provided by local and international experts, international organizations, and industry specialists in partnership with government agencies. Technical support and capacity-building should take into consideration the local context of ASM to ensure alignment with global standards while addressing local challenges. Initiatives such as the planetGOLD program that aim to reduce and ultimately eliminate the use of mercury can serve as a model (planetGold, n.d.)

## Incentives

Incentives are an important element to promote ASM formalization. Economic incentives (see Box 1 for more details), such as microfinance loans at reduced interest rates, suitable tax regime in line with ASM realities as opposed to LSM tax regime, and revenue-sharing schemes, can provide financial stability and encourage ASM operators to implement responsible mining practices and to comply with regulations.

Regulatory incentives, including simplified and decentralized licensing and permitting systems, which brings miners closer to regulatory bodies may help formalize ASM operators in remote locations and reduce illicit trade. The World Bank's Sustainable Management of Mineral Resources Project (SMMRP P096302 and P151124) in Tanzania, for example, supported reforms by the Tanzanian government aiming to simplify mining licence procedures, decentralize inspections and licences extensions, digitize the mineral cadastre, and providing access to finance to miners to support formalization. The project resulted in a reduction of licensing procedures from 18 months to 2 months and to an increase from 4,000 to 35,000 miners holding licences.

Additional incentives that are technical and environmental, such as access to mercury-free technology, training programs, and environmental compliance support, may also promote safer and more sustainable operations.

Furthermore, social and institutional incentives, like certification programs (e.g., Fairmined, Fairtrade Gold), cooperative support, and health and safety initiatives are essential to improve working conditions and community benefits. A well-balanced incentive system, consisting of achievable actions as opposed to stringent incentives should be considered to accelerate ASGM formalization.

## Access to Finance and Markets

It is important to ensure that ASM miners have access to fair markets (premium pricing, especially if a domestic purchasing plan is being implemented by a country's central banks or other financial institutions), financing, and value-added opportunities, as this is key to improving incomes and livelihoods. Traceability systems, such as the Organization of Brazilian Cooperatives in Brazil (Alliance for Responsible Mining, n.d.), must be strengthened to help prevent smuggling and illicit trade, to ensure minerals enter formal supply chains, and to promote ethical sourcing. Policies should provide a legal basis for ASM miners to secure fair prices and have access to financial services, which in turn will reduce reliance on exploitative intermediaries. Domestic purchasing programs through central banks can be an effective approach to offer miners a legal and stable market while enhancing government oversight and revenue collection. Extra premium on purchases by central banks can be offered for ASM operators who demonstrate a full oversight of their production, from the pit to the market.

## Transparency and Governance

The strengthening of oversight mechanisms is essential to encourage accountability and responsible ASM practices. The regulatory framework should have a "plan-do-check-act" approach to enable continuous monitoring, evaluation, and improvement of policies and regulations. Clear governance structures must be designed to enhance compliance, reduce corruption, and promote ethical mining practices.

## Monitoring and Enforcement

To build trust amongst formalized miners and government agencies with mining and environment in their portfolio, it is essential to implement efficient oversight mechanisms capable of curbing illegal mining, corruption, and illicit trade. Robust enforcement measures should ensure compliance with legal and environmental standards but also provide protection for miners and communities. The oversight mechanism must include regular inspections, audits, and reporting systems in order to improve transparency and ensure a high level of accountability. The level of compliance can be used as an incentive, which may include premium pricing or easier access to finance, to encourage ASM operators to continuously work toward being compliant and maintaining compliance. Maintaining an effective monitoring system is the cornerstone to support the long-term formalization process of ASM.

## Grievance Mechanisms

Governments should establish clear dispute resolution systems to foster collaboration between ASM and LSM operations and between ASM miners and government agencies. By providing accessible, fair, and transparent channels for addressing conflicts, authorities can reduce tensions, promote dialogue, and ensure equitable resource management.

# 3.0 Overview of Legal Framework Components in Tanzania and Ecuador

Tanzania and Ecuador have well established ASM sectors. In Tanzania, mining is regulated by the Mining Act, Cap. 123 [R.E. 2019] (United Republic of Tanzania, 2019) and in Ecuador, the Mining Law (Ley de Minería) enacted in 2009 (National Assembly of Ecuador, 2009) serves as legal framework. In both jurisdictions, the legal framework has specific provisions for the ASM sector.

Tanzania first introduced ASM in the Mining Act in 1979, with subsequent amendment to ASM provisions in 1998 and 2010. Tanzania has been at the forefront of ASM formalization for decades, and the country is continuously addressing gaps in implementation of the current legal framework. In Ecuador, ASM was first introduced in the Mining Law of 1991 and amendments were included in 2009 which further refined the regulatory environment for ASM, establishing clearer definitions and support mechanism for ASM miners.

Table 1. Comparisons of key components of ASM legal frameworks in Tanzania and Ecuador

| Components | Tanzania | Ecuador |
|---|---|---|
| **Consultations** | No formal and inclusive consultation platforms.<br>Current consultation provisions are limited to the government stakeholders. Improvements to be made. | Legal provisions for inclusive consultations are in place. Mining Law, 45 § Arts. 87-90 (2009) |
| **Legal and regulatory framework** | Comprehensive legal and regulatory framework in place, with detailed ASM categorization. Mining Act, Cap 123 § Art. 4, 15(2), 22, and 54-58 (2019) | Comprehensive legal and regulatory framework in place, with detailed ASM categorization. Mining Law, 45 § Arts. 134 and 137 (2009) |
| **Technical support and capacity-building, and best practices** | Legal provisions are in place. Mining Act, Cap 123 § Art. 27A (2019)<br>The Geological Survey of Tanzania has mandate to support small-scale miners on geoscientific services.<br>Tanzania has signed and ratified the Minamata Convention on Mercury. | Legal provisions are in place. Mining Law, 45 § Art. 136 (2009)<br>The Sectorial Ministry may rely on universities and polytechnic institutions to provide technical support for artisan miners and small-scale miners get support from programs led by the National Institute of Geological Research. |

| Components | Tanzania | Ecuador |
|---|---|---|
| | | Ecuador has signed and ratified the Minamata Convention on Mercury. |
| **Incentives** | Legal provisions include tax incentives. Mining Act, Cap 123 § Art. 4 (2019). Several non-binding initiatives are continuously implemented, e.g., World Bank's Sustainable Management of Mineral Resources Project. | Legal provisions include environmental, social, and economic benefits incentives. Mining Law, 45 § Art. 137 (2009)<br>Several non-binding initiatives are continuously implemented. e.g., Central Bank Artisanal and Small-Scale Gold Mining Domestic Purchase Programmes. |
| **Access to finance and markets** | Some steps have been initiated but improvements to be made on access to finance, e.g., World Bank's SMMRP.<br>Legal provisions are in place for access to the market. Mining Act, Cap 123 § Art. 27C (2019) | Improvements to be made on access to finance.<br>Legal provisions are in place for access to the market. Mining Law, 45 § Arts. 49, 139 (2009) |
| **Transparency and governance** | Need to be addressed. | Partially addressed for permitting process. Transparency and governance provisions can be strengthened and extended to the entire value chain. Mining Law, 45 § Art. 29 (2009) |
| **Monitoring and enforcement** | Legal provisions are in place. Mining Act, Cap 123 § Art. 22 (2019)<br>The Ministry of Minerals has mandate to monitor, and the Mining Commission (or an "authorized officer") has combined monitoring and enforcement mandates. | Legal provisions are in place.<br>The Mining Regulation and Control Agency has the competence to supervise and enforce administrative decisions. Mining Law, 45 § Art. 8, 9, 11, 23, 24, 30, 31, 52, 62, 63, 78, 99, and 150 (2009) |
| **Grievance mechanisms** | Legal provisions are in place. Mining Act, Cap 123 § Art. 119 (2019)<br>The Mining Commission acts as a mediator to resolve conflicts arising from mining activities. | Grievances are directly addressed to courts (national or regional in Latin America). Mining Law, 45 § Art. 150 (2009). The mechanism could be strengthened by having a mediation |

| Components | Tanzania | Ecuador |
|---|---|---|
| | | step which can be a simplified process before a matter is escalated to a court. |

Source: United Republic of Tanzania, 2019; National Assembly of Ecuador, 2009.

## 3.1 Case Study 1: Tanzania

Tanzania has a long history of ASGM, representing the largest ASM sub-sector. Tanzania ranks as the seventh largest gold producer in Africa. ASGM production is estimated to have risen from 10% of the country global gold output in 2012, to 30% in 2020, attributed to the formalization of the ASGM sector (World Gold Council, n.d.; UNEP, 2012; Maganga et al., 2023).

ASGM has gone through several stages of formalization reforms as followed:

- **1979:** ASM is integrated in the legal framework, though it is not well-defined and supported under this Mining Act, yet it paved the way for ASM formalization process.
- **1998:** Primary Mining License (PML) is introduced for small-scale miners and ASM recognized as a distinct sector.
- **2009:** The regulation enhanced local participation in ASM, introduced stricter environmental and safety regulation for ASM, and provision to protect local miners from displacement by LSM companies.
- **2010:** Restriction of foreign ownership in ASM operations. However, ASM miners struggled due to limited financial access and high regulatory costs.
- **2019:** More emphasis on value addition in ASM (local processing and refining) and introduction of mineral trading centres, allowed partnerships between LSM and ASM miners, and increased penalties for unlicensed mining. ASM miners gained better market access but also faced stricter compliance requirements.

### Strengths of the Legal Framework and Recent Initiatives

Tanzania's ASM sector benefits from a well-established legal framework that formally recognizes ASM and has a special licensing scheme through PMLs that ensures exclusive access for Tanzanian citizens. The Mining Commission, established in 2017, has streamlined licensing which has reduced bureaucratic delays in permit approvals. The creation of local mineral trading centres in 2019 has significantly improved ASM miners' access to fair markets, reducing mineral smuggling and ensuring better pricing. The government has also set lower tax rates and incentives for small-scale miners to support their growth. Current environmental regulations

require that ASM operations follow impact assessment guidelines to promote responsible mining and land rehabilitation efforts.

To further strengthen the ASM sector, Tanzania has launched multiple initiatives focused on formalization, financial access, and technological advancement. The government has actively promoted registration campaigns to encourage miners to legalize their operations, and provided training on technical skills, safety, and financial management (UNEP, 2012). Attempts to improve access to finance have been made by the government to encourage partnerships with commercial banks to facilitate low-interest lending, and through the Mineral Development Fund initiated by the Ministry of Minerals, which offers loans and credit facilities to ASM operators; however, both initiatives have only shown limited results (UNEP, 2012). Specific ASM mining zones have been designated to prevent land conflicts with large-scale miners, ensuring miners have secured areas for operations. The government has also introduced the Mineral Revolving Fund to provide mining equipment and mercury-free gold processing technologies, improving efficiency and environmental sustainability (UNEP, 2012). More recently, in September 2024, the Bank of Tanzania mandated that all mining firms and gold traders exporting the commodity allocate at least 20% of their production for sale to the Central Bank (Dausen, 2024). While the exact share of ASGM production involved in the Bank of Tanzania's scheme remains unclear, as the measure specifically targets exports, this initiative provides opportunities for ASGM miners to benefit from international market pricing. Lastly, the establishment of monitoring mechanisms by the Mining Commission ensures compliance with safety and environmental regulations, fostering a more responsible and productive ASM sector.

## Areas of Improvement

Tanzania has made commendable progresses in formalizing and regulating the ASM sector. However, improvement is required in areas related to transparency and governance of the tenure of PML licences. Some published reports suggest that certain PML licence holders "informally" lease their mining rights to other actors on the ground, meaning there is a decoupling between the approved and documented licence and actual activities on site (Jønsson and Fold, 2009).

A gap in the legal framework that needs to be addressed is the establishment of a formal dialogue platform between ASM miners, LSM companies, government agencies, and mining-affected communities to facilitate communication, joint decision making, and provide a means to address disagreement before conflict arises. Such a dialogue platform would enable small-scale miners to voice concerns and ensure policies that reflect their needs are developed while also addressing disputes over land and resource access.

Financial access is also an area requiring improvement, particularly when it comes to securing funds for conducting geological investigations. Previous reports have highlighted that access to financing for conducting geological studies, essential for assessing the economic viability of areas allocated for ASM, is uneven. As a result, the poorest groups of miners are often

marginalized; they either lack access to land where comprehensive geological studies have been conducted and economically viable mineral resources are present, or they are confined to narrow strips of land with limited potential (UNEP, 2012). Measures should be taken to rebalance the benefits and ensure more equitable access for all miners. Establishing loan and credit programs with low interest rates and flexible repayment terms, alongside public-private partnerships with banks and microfinance institutions, could encourage more miners to transition into formalized operations.

Other areas of improvement include marketing and gold commercialization. While the Bank of Tanzania has launched initiatives to purchase at market price 20% of all the gold to be exported, the measures do not impact so much the in-country trading (Dausen, 2024). Investment in mineral processing facilities locally could enable the implementation of gold certification programs and help ASM miners to secure better pricing when trading.

Despite efforts to ban the use of mercury in ASM gold extraction, compliance with environmental regulations, particularly those concerning mercury control, remains challenging. The implementation of the National Action Plan under the commitment of the Minamata Convention, though already developed, is progressing slowly, as mercury remains largely accessible (Makoya, 2023). Further action is required to promote mercury-free extraction techniques, either through capacity-building initiatives or the introduction of economic incentives, such as offering premium prices for mercury-free gold production.

## 3.2 Case Study 2: Ecuador

Ecuador has a significant history of ASGM, which for many years accounted for nearly all the country's gold production prior to 2019 (respectively, 89% for the small-scale sector and 11% for the artisanal sector); the sector employs between 11,500 and 20,000 individuals directly and indirectly (Almeida, 2019). In 2024, the large-scale Lundin Gold's Fruta del Norte mine in southeast Ecuador achieved a record gold production of 502,029 ounces (16 metric tonnes), representing 56% of Ecuador's annual production of gold, which resulted in a lower share of ASGM production at national level. Despite its economic significance, the ASGM sector in Ecuador faces challenges, such as informality, environmental concerns, and associations with illicit activities. During the past decade, the country has also faced a significant upsurge in gang violence which poses significant governance and security challenges.

Ecuador's ASM sector has undergone significant regulatory transformations from the 1991 Mining Law to present-day reforms. The government has introduced policies aimed at formalizing ASM and improving environmental management. Below is an overview of key legislative changes and amendments that affected Ecuador's ASM regulation (National Assembly of Ecuador, 2009).

- **1991:** The first contemporary mining law recognized ASM, but it lacked clear guidelines for formalization and did not include strong environmental or social impact regulations.
- **2009:** Increased regulations on ASM by introducing a clearer licensing framework, stronger environmental requirements; simplified licensing system, established (reduced) royalty payments to promote ASM formalization; introduced a tiered system for artisanal, small-, and medium-scale mining; provided technical support and financial incentives for formalization while increasing penalties for illegal mining and environmental violations.
- **2013:** Legal provision granting the Central Bank of Ecuador mandate to purchase non-monetary gold from small-scale and artisanal miners, either directly or through authorized intermediaries.
- **2016:** Last modification of the law with no major changes to ASM provisions. Though to comply with the legal mandate of the Monetary and Financial Code, the Central Bank initiated purchasing operations with the ASGM sector, ending its commercial relations with Ecuador's National Mining Company.

### Strengths of the Legal Framework and Recent Initiatives

Ecuador's Mining Law provides very detailed information for formalizing and regulating the artisanal and small-scale mining sector. The law recognizes ASM as a key contributor to the national economy and provides pathways for miners to operate formally. A significant strength is

the introduction of a tiered classification system, differentiating artisanal, small-scale, and medium-scale mining, each with specific requirements for licensing and operation. This distinction allows for more tailored regulations and support for ASM miners. Additionally, the reduced tax rates and royalties' scheme for ASM operators make fiscal compliance more accessible and encourage legal operations over informal practices (Mining Law, 45 § Art. 148 and 149 [2009]). Ecuador's mining policy also prioritizes environmental oversight, requiring small-scale miners to obtain environmental permits.

To further strengthen ASM, Ecuador has launched several initiatives focusing on formalization, financial support, and technical capacity-building. The government has streamlined licensing and registration processes, reducing bureaucratic barriers that previously hindered small-scale miners from entering the formal sector (UNEP, 2012). Financial incentives and credit programs have been introduced to help small-scale miners access capital for equipment and environmentally friendly technology (Avellán, 2024). The government has also invested in training programs to educate miners on safe, efficient, and mercury-free gold extraction methods in line with the Minamata Convention on Mercury (UNEP, 2012). Furthermore, stricter enforcement mechanisms, including higher penalties for illegal mining, have been implemented to discourage unregulated operations while promoting responsible mineral trade (UNEP, 2012).

## Areas of Improvement

The Ecuadorian example is remarkable given that the ASGM sector has, for many years, accounted for nearly the entire national gold output, until 2021–2022 when the Fruta del Norte mine entered into production. The major shift in regulatory framework in 2009 not only boosted the ASGM sector but also led to more formalization and professionalization of the ASM sector. Improvement in areas of governance, transparency, and revenue tracking would help tackle illegal mineral trade. Ecuador's current conflict resolution system does not have a mediation step before grievances are brought into a court. Establishing a simplified mediation process before legal proceedings would provide a more efficient way to resolve mining-related grievances, given that legal proceedings are often lengthy, costly, and complex. Another key area for improvement is access to finance. While Ecuador has financial support mechanisms, they need to be expanded and simplified to reach more ASM operators. Establishing stronger partnerships with microfinance institutions and development agencies could facilitate low-interest loans and credit guarantees tailored for ASM.

The main lessons that we can learn from Ecuador is that ASGM can sustain a nation's gold output, and well thought reforms can create a more responsible, sustainable, and productive ASGM sector that contributes positively to the national economy and ensures environmental and social safeguards.

# 4.0 Conclusion

The case studies of Tanzania and Ecuador illustrate how regulatory reforms and targeted initiatives can drive formalization and sustainable development within the ASGM sector. Tanzania's approach, characterized by mining-specific licensing schemes, local market initiatives, and environmental oversight, has led to a significant increase in ASM's contribution to national gold production. However, challenges in transparency and governance, financial accessibility, marketing and commercialization of ASGM production—in particular in collaboration with the Bank of Tanzania and stakeholder engagement—remain areas for improvement. Strengthening transparency and governance of the licensing system, establishing formal consultation mechanisms, introducing financing options that are equitably accessible to the poorest miners and the more advance semi-mechanized operations, and the continued implementation of the Minamata Convention, can further enhance ASM's potential as a key driver of economic and sustainable development.

Ecuador's experience demonstrates how comprehensive legal reforms, including tiered mining classifications and environmental regulations, can legitimize ASGM operations and sustain national gold production. Despite these advances, governance issues, illicit trade, and financial constraints hinder full integration into formal supply chains. Introducing structured conflict resolution mechanisms, such as a mandatory mediation step before court proceedings, and expanding access to low-interest loans and credit guarantees, would significantly improve ASM's efficiency and long-term sustainability.

Ultimately, the formalization of ASGM requires a balanced approach, where governments provide clear legal pathways, financial inclusion, and environmental safeguards that are tailored to the national context. Miners should be included in consultations during formalization processes. Lessons from Tanzania and Ecuador suggest that continuous regulatory improvements, stakeholder collaboration, and financial support mechanisms are essential for achieving a responsible, transparent, and economically viable ASGM sector. Formalization should be considered as a "process," not "a starting point" or "a single-time event."

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