



Baseline Information for the National Action Plan on Artisanal and Small - Scale Gold Mining: Ghana



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How is ASGM organized in Ghana?

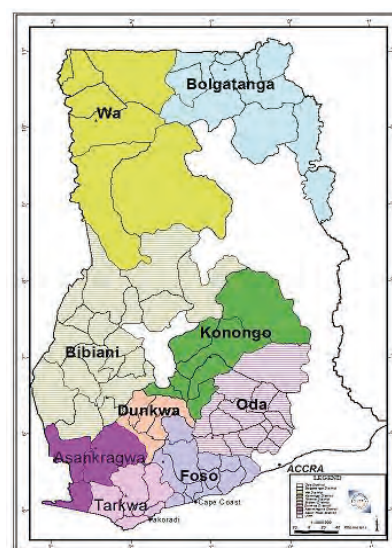
Legal and regulatory status

ASGM is legal and recognised in Ghana through the Minerals and Mining Act, 2006, Act 703 and the National Mining Policy, 2014. The Policy, Act and subsidiary legislations provides for the regulation, licensing, fiscal regime and designation of mining areas. Only Ghanaians of age 18 years and above can be granted Small scale mining license. ASGM is regulated by the Ministry of Lands and Natural Resources through the Minerals Commission. The Commission's



mandate is to regulate and manage mineral resources, and to coordinate and implement policies relating to mining. Other institutions such as the Environmental Protection Agency and Geological Survey Department play key roles in issuing environmental permits and providing geological data for miners respectively. The Precious Minerals Marketing Corporation (PMMC) is responsible for the purchase of gold produced by small-scale miners and performs other functions such as to grade, assay, value and process precious minerals and appoint licensed buyers for the purchase of precious minerals produced by small-scale miners.

To enhance the regulation and management of the ASGM sector, the Minerals Commission has established nine mining district centres in designated mining areas. The district centres are in Tarkwa, Asankragwa, Bibiani, Assin Foso, Akim Oda, Dunkwa on-Offin, Konongo, Wa and Bolgatanga. The centres are manned by District Officers who provide technical extension services including information sharing, provision of advice, and assistance and training in best practices for mining, processing, marketing, environmental sustainability and health and safety. The biggest ASGM operations occur in Tarkwa, Dunkwa, Asankragwa, Bolgatanga and Akim-Oda.



In every designated small-scale mining area, there are established District Mining Committees to assist District offices to effectively monitor, promote and develop mining operations. Currently, there are 38 District Mining Committees in the nine mining District centres.

Licensing

ASGM license is granted by the Minister responsible for Mines to a person, a group of persons, a cooperative society or a company. The license is for a period not more than five years from the date of issue in the first instance and may be renewed on expiry. The size of the area in respect of which a license may be granted for small-scale mining shall not exceed 25 acres. After the acquisition of Small-scale mining license, a prospective miner is required to receive an Environmental Permit from the Environmental Protection Agency which is renewed every two years. Miners are not required to undertake Environmental Impact Assessment before permits are issued. There about 1,000 small-scale mining licenses (Minerals Commission). The Minerals Commission charges about GHS 850 (US\$ 200) for a small-scale mining license whiles the EPA charges is GHS 6,000 (US\$1,435) for environmental permit fee.



How many small-scale gold miners work in Ghana?

There is no authoritative estimate of the actual number of people engaged in ASGM in Ghana. This is expected to be addressed by the recent announcement by the Minerals Commission to register all small-scale miners in Ghana. Studies however suggest that there are about 500,000 to 1,000,000 small-scale gold miners nationwide (Hilson, 2010). It is noteworthy that in all the nine mining districts where the Minerals Commission operates district offices, there are some associations or co-operatives of ASGM operators. There also exists a Ghana National Association of Small Scale Miners (GNASSM) which serves as the advocacy voice for small-scale miners.

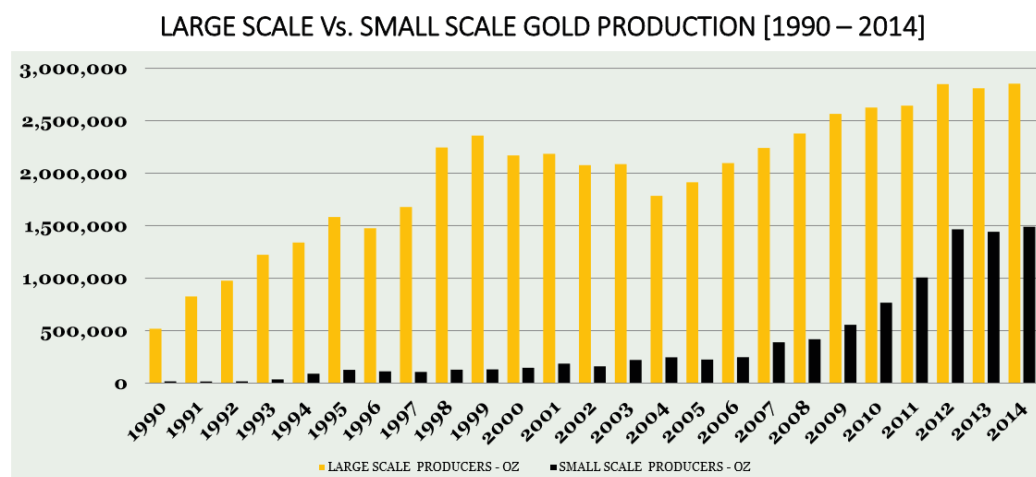
Contribution of ASGM to the Ghanaian Economy

ASGM contributes significantly to the formal and informal economy of Ghana. The sector's contribution to gold production rose from 2.2% in 1989 to 35.4% in 2014 accounting for almost 1,500,000 ounces (Minerals Commission). The sector is fast growing and supports directly and indirectly the livelihoods of many people mostly in rural areas. Miners also take up diverse roles from general labourers to skilled machinists, supervisors and bookkeepers.





Contribution of ASM to the National Economy



What are the usual gold mining practices employed?

The extraction methods in Ghana can be categorized into the following three groups: shallow alluvial mining; deep alluvial mining; and hard rock (lode) mining. Shallow alluvial mining techniques, which are popularly called "dig and wash", are used to mine shallow alluvial deposits usually found in valleys or low lying areas. Such deposits have depths not exceeding three metres. Deep alluvial mining techniques are used to mine deep alluvial deposits found along the banks of major rivers such as the Ankobra, Tano, and Offin and certain older river courses.

These methods involve excavating a pit and digging until the gold bearing gravel horizon, which is typically located at depths of 7 to 12 metres, is reached. Hard rock mining techniques are adapted to mine gold bearing reefs, which can be located close to the surface or deep-seated. In cases where the ore is hard, explosives are commonly used, despite being prohibited.

On the other hand, the tools used for mining and mineral processing methods can be classified into artisanal, semi-mechanized and mechanized. The artisanal mining practices mainly employs manual methods by using simple equipment like shovels, pick-axes, pans, chisels and hammers. Semi-mechanized and mechanized operations are characterized by the use of excavators, jaw crushers, hammer mills, ball mills and modified corn mills. Mining methods are mainly shallow alluvial, deep alluvial and hard rock (lode).



What are the usual gold processing methods?

The commonly used processing method especially for free milling ores is gravity concentration using sluicing. This involves sluicing of mined material on a sluice box to obtain gold concentrates. In recent times, mechanized processing methods are being employed using sizing trommels and Knelson concentrators for processing to obtain gold concentrates. After concentration mercury is added to gold concentrates and mixed to form an amalgam, which is then heated to separate the gold.

Current regulations do not permit the use of cyanide or other leaching techniques for small scale miners, but they are used in some mining areas in the Eastern and Northern regions of Ghana. Cyanide is widely used in neighbouring countries of Burkina Faso and Mali. The recovery rate of gold in ASGM is approximately 30-40%.

What are the main issues and challenges with regulating ASGM practices in Ghana?

Despite the sustained and growing importance of ASM in Ghana as well as its many positive economic and development characteristics, the sector continues to be overshadowed by the negative environmental and social impacts associated with operations which stem, in large part, from the fact that the majority of small-scale miners operate illegally and informally, without the security of a license.

Long and cumbersome licensing procedure

The licensing regime has been described as burdensome and overly time consuming. In addition, the licensing procedure of the ASM sector can take a year or more to complete. The licensing is bureaucratic and an important reason why most operators in the ASM sector have not been moved onto the legal framework. According to some ASM operators, obtaining an environmental permit alone (one of several steps to become legal ASM operator) usually takes several months and sometimes over a year.



Lack of geological data and limited access to viable lands

One of the major challenges of the small-scale mining sector is the lack of geological data and information with respect to minable deposits for legally registered small-scale miners. As a result most miners carry out ad hoc operations, largely by guesswork and trial and error resulting in investment losses for small-scale miners, low mineral recovery and low government revenue. Consequently, most of the legally registered small scale miners leave their concessions and operate illegally on concessions of larger mining companies.

Ecosystem Destruction and Environmental Degradation

Some ASGM operations contribute to devastating impacts on the environment and ecosystems. These effects include; deforestation and land degradation from clearing of the mining sites, over-stripping of overburden and burning of bushes. Some ASGM operators mine in forest areas sometimes clearing portions of the forest or logging some of the trees contributing to rapid reduction of the forest cover.

Water pollution is another major impact of ASGM; panning processes on the river banks, beds and the surrounding areas discharge huge amounts of loose silt and heavy metals into the river system. Normally such rivers which are sources of drinking water for surrounding communities become polluted with high levels of suspended particles, fuel, mercury, and other obnoxious chemicals. Eventually these are washed into the water bodies that serve communities and aquatic life; increasing the risk of siltation, flooding and drying up of water resources.



Dangerous nature of the work

Due to the un-regularized nature of the ASGM most of the miners work under harmful and poor working conditions, especially, they do not wear proper protective gears so the miners are therefore exposed to dangers, harmful chemicals, etc. One of the major concerns is the high number of avoidable injuries and deaths recorded in the ASGM sector each year. Injuries and death of workers caused by collapsing pits are very common. Other decent work deficits of the ASGM include child labor involving the use of under-age children used for the mining activities. There are also cases of prostitution, drug abuse and other dangerous practices at the mine sites.

Mercury use and exposure

ASGM is one of the most significant sources of mercury release into the environment. In Ghana, most artisanal gold miners combine mercury with gold concentrate to form an amalgam. The amalgam is later heated with blow torches or over an open flame to evaporate the mercury, leaving small gold pieces (ore). The gaseous mercury is inhaled by the miners and often by their immediate family, including their children. The inhalation of elemental mercury vapors can cause neurological and behavioral disorders such as tremors, emotional instability, insomnia, memory loss, neuromuscular changes and headaches. They can also harm the kidneys and thyroid glands. High exposures have also led to deaths.

Mercury that is not inhaled during the burning process settles into the surrounding environment or circulates and deposits in areas far from the site, where it is absorbed and processed by a variety of living organisms including fishes in the mercury-contaminated water bodies. This transforms elemental mercury into methylmercury.

Methylmercury is one of the most dangerous neurotoxins that contaminate the food chain through bio-accumulation.

Is the use of mercury in ASGM legal in Ghana?

The use of mercury in ASGM in Ghana is legal regulated by the Mercury Act, 1989, PNDCL 217. Registered ASGM operators and licensed traders can purchase and trade mercury legally through authorized dealers, such as the Precious Minerals Marketing Corporation (PMMC) Ltd. Mercury use, however, appears to be greater than what is officially available, suggesting a significant “black market”



for mercury. Mercury can be purchased at local stores or sourced from gold dealers. In some mining areas, gold buyers provide mercury to miners as an incentive to buy their gold. Mercury is normally sold in smaller quantities (about 5mL) and it is put into all sorts of containers including glass bottles, polythene sachets, matchboxes etc. In many instances no special precautions are taken.

How much mercury is used in ASGM in Ghana?

While there are no data available in ComTrade for imports of mercury to Ghana, Ghana government data indicate that in 2011, 2012 and 2013 approximately 19.26MT, 9.6MT and 2.5 MT of mercury respectively was legally imported into Ghana.

The major use of mercury in Ghana is in gold processing by both legal and illegal small-scale gold miners. Mercury is used mainly within the gold belt of the seven regions namely, Western, Brong –Ahafo, Central, Eastern, Ashanti, Upper East and Upper West.

The use of mercury for gold extraction from the ore (amalgamation) is widely practiced among many small-scale miners because it is easy to use, inexpensive, readily available, and highly effective at capturing gold under field conditions.

Where does mercury come from?

Mercury is not produced in Ghana, but gets into the country by legal and illegal means. When it is imported through legal means, it is cleared through the Customs Division of the Ghana Revenue Authority and quantities are documented. It is however known that the chemical has also been smuggled into the country from neighbouring countries. In the past, mercury was imported to Ghana mainly from Germany, United Kingdom, Spain, Canada and the Netherlands. However, since 2011 exports from the EU have been banned, so mercury has been entering Ghana through other means.



What are the exposures and health effects related to the use of mercury?

Mercury is one of the most toxic metals. It bio-accumulates in the food chain and becomes increasingly concentrated at higher levels. With global expansion of ASGM and pervasive mercury use in the sector, ASGM accounts for an estimated 37% of global atmospheric mercury emissions, and released 727 tons into the atmosphere in 2010.

Recent estimates indicate that the ASGM sector is the greatest mercury source worldwide and that mercury use in this sector continues to grow. Mercury use in the ASGM poses great danger to the life of the miners, their families and communities living in the affected regions. Generally when mercury is used, the amalgam is burned in the open, without control, evaporating the mercury and leaving the gold behind. Mercury emissions from ASGM contribute to mercury contamination of local and global fisheries. The indiscriminate use of mercury in ASGM contributes to serious long-term environmental and health problems. Mercury poisoning can lead to skin irritation, fever, headaches, nausea, irritability, fatigue, loss of speech and memory decline. Exposure to mercury can also lead to blindness, depression, kidney disease, tremors, brain damage, serious birth defects and death.

There exists strong evidence of mercury contamination in biotic and abiotic samples in proximity to ASGM sites in Ghana. As outlined in the Natural Sciences review of the Integrated Assessment of Artisanal and Small-scale Mining in Ghana, mercury levels have been reported in water (range: from below detection limits to 50 $\mu\text{g/L}$), sediment (range: from below detection limits to 48.848 $\mu\text{g/g}$), soil (range: from below detection limits to 185.938 $\mu\text{g/g}$), and left over refuse or tailings (range: 0.011 to 19.296 $\mu\text{g/g}$) collected from sites across Ghana, many of which are in close proximity to mining activities.



Recommendations for Development of the National Action Plan

Stakeholder Participation

Stakeholder participation in the design and implementation of National Action Plan (NAP) development is very critical. Having stakeholders involved from development through to implementation will help to instill a sense of ownership of the process, making it easier to implement the changes proposed in the NAP. For example, the process should involve multiple relevant ministries in the government (e.g., environment, mining, health, labor) as well as their local government counterparts, small-scale miners or associations that represent their interests, NGOs, large-scale mining interests, health specialists and providers, gold buyers, academia, and others. Mining communities and miners should also be involved so they could have personal connection to the issues and understand the intricacies of how ASGM functions in reality. Annex A provides a detailed list of the stakeholders that should be involved in the NAP in Ghana.



Recommended actions to be included in the National Action Plan

Through stakeholder consultations facilitated by Friends of the Nation with miners in Tarkwa, Assin Fosu, Mpohor and Obuasi, the following recommendations were prioritised.

STEPS AND STRATEGIES

RECOMMENDED ACTIONS

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| 1 | Actions To Eliminate Worst Practices Of Mercury Exposure | Demarcate areas for the processing of ore (mercury amalgamation) at mining sites
Public education on the harmful effects of the use of mercury
Strict actions against unguarded use of mercury by ASGM
Support miners to acquire PPEs for their operations
Government should review mining laws to prohibit open burning of mercury amalgam |
| 2 | Steps to facilitate formalisation or regulation of the ASGM sector | Undertake extensive geological investigation to identify viable lands and allocate to ASGM miners
Decentralise and streamline licensing processes and make the affordable and accessible
Upscale Certification
Increase public education on the environmental and metallurgical best practices of ASGM
Improve access to geological information and viable lands and better financing
Creation of more offices of the Minerals Commission and the EPA at the district level to deal with small-scale mining issues
Increase enforcement and monitoring to reduce illegal mining
Create better financial incentives for investment in small-scale mining (provision of equipment as hire purchase, access to viable lands) |
| 3 | Strategies for promoting the reduction of emissions and release of, exposure to mercury in ASGM, including mercury free-methods | Promote the use mercury-free and mercury reduction gold recovery techniques such as Direct Smelting method, retorts
Improve the thermex Retort to withstand high temperature
Establish Centralised Mercury Free Gold Recovery Plants
Support the formalization and the regularization of ASGM
Designate / demarcate special sites for work on amalgam to control the use of mercury
Effective monitoring and control of mercury use
Research into alternative methods and publicize the most effective ways/methods |
| 4 | Strategies for managing trade and diversion of mercury for use in ASGM | Be strict on the importation of the mercury
Mercury trade and supply should be monitored by the security agencies
Miners should be educated on the use of mercury and its bad effects |
| 5 | Strategies for providing information to artisanal and small-scale gold miners and affected communities | Support NGOs, CSOs to increase public awareness on the Impact on Mercury, Minamata Convention and Mercury-free technology
Use local media outlets to increase public awareness and provide information to miners
Use local drama and reader-friendly IEC material to reach out to miners |
| 6 | A public health strategy on the exposure of artisanal and small-scale gold miners and their communities to mercury | Continuous training for health care workers of the effects of mercury to enable recognize, diagnose and treat mercury poisoning.
Health centres and systems should have treatment protocols in place for mercury-related health effects, including exposure to mercury in ASGM.
Effective intersectoral engagement between health and other relevant ministries and agencies on ASGM
Creation of special mercury labs on mining sites to control the emission of mercury pollution
Periodic medical screening in mining communities |

Annex A: List of stakeholders to be involved in the development and implementation of the NAP Government Private Sector Civil Society Ministries

GOVERNMENT

Ministeries

- Ministry of Environment Science and Technology
- Ministry of Lands and Natural Resources
- Ministry of Trade and Industry
- Ministry of Justice and Attorney General's Department
- Ministry of Local Government and Rural Development
- Ministry of Health
- Ministry of Employment and Labour Relation
- Ministry of Gender, Children and Social Protection
- Ministry of Finance
- Ministry of Chieftancy and Religious Affairs Departments and Agencies

Departments and Agencies

- Minerals Commission
- Environmental Protection Agency
- Geological Survey Department
- Ghana Health Service
- National Development Planning Commission Water Resources Commission
- Precious Mineral and Marketing Corporation
- Ghana Atomic Energy Commission
- Centre for Scientific and Industrial Research

PRIVATE SECTOR

- Ghana Chamber of Mines
- Ghana National Association of Small-scale Miners
- Ghana Institute of Freight Forwarders
- Gold buyers
- Gold jewelers

CIVIL SOCIETY

- NGOs (National and International)
- Academia
- Research Institutions
- Traditional Authorities
- Miners
- National House of Chiefs

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Contact

Solomon Kusi Ampofo
Natural Resources Governance Coordinator
Friends of the Nation
Email: s.ampofo@fonghana.org; info@fonghana.org
Tel: +233-24-4055951

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